Premise

ENVIRONMENT

FOREST WIND

ECOLOGICAL ASSESSMENT

Report No: 1701513b

Rev: B

Date: October 2017

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APPENDICES

DOCUMENT AUTHORISATION					
Revision		**Rev. Date**		**Report Details**	
DRAFT		18 August 2017		Ecological Assessment Report	
a		20 September 2017		Ecological Assessment Report	
b		05 October 2017		Ecological Assessment Report	
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Executive Summary

CleanSight Pty Ltd proposes to develop a wind farm and associated infrastructure project (Forest Wind Project, herein referred to as the Project) on State-owned land between Gympie and Maryborough, Queensland. The site is characterised by flat to undulating terrain with elevations of 10m to 150m AHD (Australian Height Datum) and is used for the primary purpose of growing and extracting exotic pine from a major forestry plantation. The turbines are located adjacent to existing logging roads within the exotic pine plantation.

Under State Code 23: Wind Farm Development, within the State Development Assessment Provisions (SDAP), wind farm development is required to ensure that risks to flora, fauna and associated ecological processes are mitigated or managed through effective siting, design and operation of the wind farm. This is addressed in this assessment and informs the development assessment process. The assessment confirms the Project complies with Performance Outcomes PO5 (flora and fauna), PO7 (stormwater management), PO8 (watercourses and drainage features) and PO13 (construction management) of the State Code 23.

Assessment of Matters of National Environmental Significance (MNES) desktop and field survey results will be facilitated through other permits and approvals, not the MCU application. As such; although MNES are discussed in the context of describing the existing environment, they are not the primary focus of this investigation and report.

Methods

A summer 2016 - 17 survey program involved desktop assessments, initial environmental constraints mapping and analysis, risk assessments and development and implementation of a field survey program in consideration of species likely to occur and/or at risk.

Data collated during the desktop assessments and field surveys was analysed to describe the existing environment, including if the study area contained suitable habitat for conservation significant species and whether the Project has the potential to impact on these species.

Existing Environment

The Project is located in Tuan, Toolara and Neerdie State Forests, which are highly modified landscapes of exotic pine plantations. The Project is ideally situated as the exotic pine plantations are considered of low ecological value.

There are no world heritage properties, national heritage places, wetlands of international importance or commonwealth marine areas and the study area is not within the Great Barrier Reef Marine Park.

There are several watercourses across the study area which are mapped as Matters of State Environmental Significance (MSES) wetlands. Some of these watercourses were observed during the field surveys and some observed within the pine plantations were degraded with limited riparian vegetation. Although the study area is predominantly exotic pine, there remains small pockets of remnant vegetation, including mapped Regional Ecosystems (REs) within the plantations. Of the 13 mapped remnant REs within the study area, one (1) is classed as Endangered, six (6) are classed as Of Concern and six (6) are classed as Least Concern under the provisions of the *Vegetation Management Act 1999* (VM Act).

Areas of Essential Habitat (EH) for Wallum froglet (*Crinia tinnula*) and Wallum rocketfrog (*Litoria freycineti*) which are listed as vulnerable under the NC Act, are mapped within remnant vegetation in the study area. Some small areas of EH for ground parrot (*Pezoporus wallicus wallicus*) which is listed as Vulnerable under the *Nature Conservation Act 1992* (NC Act), are mapped in the northern portion of the study area.

Some threatened species are considered likely or as having potential to occur in the study area. Impact to these species is considered low due to behavioural characteristics such as low flight behaviour, habitat preferences and project infrastructure siting away from potential habitat areas. The study area is not considered to provide habitat critical to the survival of the threatened species likely or with potential to occur, and it is considered unlikely that the study area will contain an important population of threatened species likely or with potential to occur.

Potential Impacts

The construction and ongoing operation of the Project within the study area has a low potential to impact on the nature conservation values of the area. The study area is located within exotic pine plantations that retain small areas of fragmented remnant vegetation. The Project (i.e. project infrastructure) within the study area will aim to avoid environmentally sensitive areas (ESA) such as remnant vegetation, essential habitat and watercourses / wetlands. Whilst the study area is expansive, the disturbance footprint for the Project is small.

The siting of the Project within the pine plantations allows areas of ecological significance to be largely avoided, which has been validated through this ecological assessment and design layout.
The Project study area allows for micro-siting of infrastructure during the detailed design stage which will allow further avoidance of localised habitat features during construction. Impacts to terrestrial and aquatic flora and fauna are not considered significant. Impacts to State listed bird and bat species are not considered significant. Risks and impacts to Matters of National Environmental Significance, while considered low, will be assessed through a separate approval process.

Mitigation

It is considered that locating the Project in an exotic pine plantation is the most effective mitigation measure to avoid any significant impacts occurring to terrestrial and aquatic flora and fauna, including bird and bat species.
The following strategies, plans and assessments are recommended prior to construction, to further mitigate and manage potential risks and impacts associated with construction and operation of the wind farm.

- Micro-siting undertaken during detailed design to further minimise impact on the mosaic of native vegetation within the pine plantations.
- Span water crossings.
- Undertake targeted flora surveys in high-risk areas identified on Department of Environment and Heritage Protection (DEHP's) Protected Plants Flora Survey Trigger Map in accordance with the DEHP Flora Survey Guidelines – Protected Plants for clearing in mapped high-risk areas.
- Update the draft EMP, including developing an adaptive management monitoring program which sets out key impact management strategies for birds and bats.
- Prepare a fauna welfare plan to address issues arising from any bird and bat strike at turbines and overhead powerlines.
- Develop a Significant Species Management Plan for NC Act and Burnett Mary NRM Back on Track Report species listed as Endangered, Vulnerable or Near Threatened that have previously been recorded in Tuan, Toolara and Neerdie State Forests or species which may have potential to occur, prior to commencing clearing and construction work. The plan should include:
    - Management measures including those for the construction and operation of the Project and associated infrastructure

    - A monitoring and evaluation program with measurable targets for the communities and species
- Develop an Erosion and Sediment Control Plan and Stormwater Management Plan prior to commencing clearing and construction work to minimise erosion around the disturbance area and control sediment runoff.
- Undertake weed assessments prior to ground disturbance and continue to regularly monitor for changes in weeds throughout the project.
- Develop a detailed Weed Management Plan that addresses the construction, rehabilitation and operation phases of the project prior to commencing clearing and construction work. The plan should include hygiene protocols to minimise the likelihood of introduction and spread of environmental and declared weeds. These should include:
    - Implementation of sediment control mechanisms to reduce the potential for the spread of weed species into sensitive areas.
    - Vehicle wash down procedures and facilities to avoid the potential for weed spread.
- Develop a Fire Management Plan.
- Undertake preclearance surveys within 14 days of clearing activities.

Residual Impacts

Significant residual adverse impacts are not considered likely for the Project. An adaptive management monitoring program (pre-construction and operational) to document any bird and bat mortalities is recommended to assess any residual impacts and the effectiveness and efficiencies of management measures.

Cumulative Impacts

Some species either known to occur or with the potential to occur have a wide distribution or are known to potentially migrate long distances. Previous studies have assessed cumulative impacts of white-bellied sea-eagles and 34 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species including migratory birds and grey-headed flying fox, across 56 wind farms in Australia (mostly in Victoria and South Australia) (including 29 built and 27 proposed (Smales, 2005), with the cumulative impact considered low for the majority of species.

The nearest known approved wind farm in Queensland at the time of writing is the Coopers Gap Wind Farm located approximately 180km south west of the study area. Cumulative impacts are not considered likely for the project.

Preliminary Environmental Management Plan

A Preliminary Environmental Management Plan (EMP) has been prepared to ensure contractors minimise, control and monitor any impact on the environment while undertaking construction works and also during operation of the project.

Conclusions

This assessment complies with the State Code 23: Wind Farm Development. The assessment confirms the Project has considered the risk to flora, fauna and associated ecological processes and these risks are mitigated or managed through effective siting, design and operation of the wind farm. The assessment confirms the Project complies with Performance Outcomes PO5 (flora and fauna), PO7 (stormwater management), PO8 (watercourses and drainage features) and PO13 (construction management) of the State Code 23.

List of Abbreviations

Abbreviation	Definition
ALA	Atlas of Living Australia
AVH	Australia's Virtual Herbarium
Biodiversity Status: E OC NC	 Endangered Of Concern No Concern at Present
Conservation Class (VM Act): E OC LC	 Endangered Of Concern Least Concern
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEE	Commonwealth Department of the Environment and Energy
DEHP	Queensland Department of Environment and Heritage Protection
DIWA	Directory of Important Wetlands in Australia
DNRM	Department of Natural Resources and Mines
DSEWPC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
DSITI	Queensland department of Science, Information Technology and Innovation
EH	Essential Habitat
EPBC ☒Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EVNT	Endangered, Vulnerable or Near Threatened (conservation status listing of species under the EPBC Act or NC Act)
FCRC	Fraser Coast Regional Council
GBR	Great Barrier Reef
GES	wetland of General Ecological Significance
GPS	Global Positioning System
GRC	Gympie Regional Council
ha	Hectare
HES	wetland of High Ecological Significance
km	Kilometre
LGA	Local Government Areas
MNES	Matter of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Queensland's Nature Conservation Act 1992
NCWR	Nature Conservation (Wildlife) Regulation 2006
NSW	New South Wales
OZCAM	Online Zoological Collections of Australian Museums
PMAV	Property Map of Assessable Vegetation
PMST	Commonwealth EPBC Act Protected Matters search tool
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SDAP	State Development Assessment Provision
SPP	State Planning Policy
TEC	Threatened Ecological Community
VM Act	Queensland's Vegetation Management Act 1999
WPA	Wetland Protection Area

1 INTRODUCTION

CleanSight Pty Ltd proposes to develop a wind farm project (Forest Wind, herein referred as the Project) and associated infrastructure across the Gympie Regional Council (GRC) and Fraser Coast Regional Council (FCRC) local government areas (LGA). The study area for the purposes of this assessment covers various options and scenarios associated with the proposed development (refer **Figure 1**).

Wind farm developments have the potential to impact on flora, fauna and associated ecological processes within and surrounding the development area, including bird and bat strikes and barotrauma (physical damage due to sudden changes in air pressure), in addition to potential impacts on the migratory routes of individual bird species (Department of Infrastructure, 2016). An ecological assessment has been undertaken to describe the existing environment and to assess the potential impacts that the project may have on flora and fauna, particularly Matters of State Environmental Significance (MSES). This information will inform the Development Assessment and Material Change of Use (MCU) application. The ecological assessment will also inform a separate approval process and potential referral to the Federal Minister of the Environment for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This ecological assessment has been prepared in accordance with:

- *Wind Farm State Code, Planning Guideline* (July 2017), Department of Infrastructure, Local Government and Planning
- *State Development Assessment Provisions V2.1* (August 2017), Department of Infrastructure, Local Government and Planning

This ecological assessment addresses State Code 23: Wind Farm Development: Performance Outcomes PO5 (flora and fauna), PO7 (stormwater management), PO8 (watercourses and drainage features) and PO13 (construction management).

1.1 Project Overview

The proposed development may include:

- up to 300 large wind turbines with a blade tip height of up to 250m;
- access tracks;
- electrical reticulation between wind turbines (underground or overhead);
- crane hardstands and laydown areas for infrastructure;
- operation compounds;
- battery storage facility/s;
- substation/s;
- component manufacturing / assembly areas; and
- temporary facilities such as construction compounds and concrete batching plants.

Queensland's transmission network service provider, Powerlink, will resolve an approximate 36km 275kV transmission line from the Project to their Woolooga substation 12km west of Curra once the wind farm's development approval is received. Powerlink will be responsible for the transmission line route selection, community engagement, land security, environmental and planning assessments for this component.

1.2 Study Area

The area under consideration includes the exotic pine plantation within the Toolara, Tuan and Neerdie State Forests (the **Scoping Area**) covering approximately 103,000 ha. The Scoping Area has a single

landowner, being the State (represented by Department of National Parks, Sports and Racing), with land titles on which turbines are proposed include:

- Lot 915 of Crown Plan FTY1775 (51,900 ha)
- Lot 1004 of Crown Plan FTY1659 (41,590ha)
- Lot 1419 of Crown Plan FTY1697 (10,400ha)

Infrastructure corridors provide potential locations for wind turbines, electrical reticulation, roads and facilities (the **Study Area**), and form approximately 9,000 ha, or 8.7 % of the Scoping Area. Following detailed design and micro-siting and construction, the Project infrastructure (the **Project**) will occupy approximately 1,122 ha, or 12 % of the Study Area, or 1.1 % of the Scoping Area.

The Development Application will seek consent to build the Project within the Study Area.

1.3 Study Objectives

O2 Ecology (now Premise) was commissioned to conduct an ecological assessment in accordance with Performance Outcome 5 (PO5) of the *Wind Farm State Code, Planning Guideline (July 2017)*, DILGP to inform the preparation of a Development Application (MCU). Desktop assessments and site surveys, including targeted bird and bat surveys aimed to:

- determine existing environmental values of the scoping and study area;
- undertake likelihood of occurrence assessments of Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) and/or Nature Conservation Act 1994 (Qld) (NC Act) protected species and communities which may occupy or use the study area;
- identify species and areas which will require further assessment during the detailed design and construction phase; and
- Identify potential impacts and mitigation measures associated with construction and operation

Whilst an assessment of EPBC Act protected communities and species (MNES) is included in this report, information collected on MNES during the assessment will inform a separate report and approval process. The focus of this assessment is to assess local ecological values and potential impacts in accordance with the *Wind Farm State Code, Planning Guideline (July 2017)*, DILGP.

2 METHODS

This section outlines the methods undertaken to describe the existing environmental values of the study area and broader scoping area. A combination of desktop assessments, site assessments (including bird 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 study and scoping area. This section also outlines the terminology and nomenclature used in this report and describes the procedures and guidelines used in undertaking the assessment of the study area.

2.1 Desktop Assessment

A desktop assessment of available State and Commonwealth databases were undertaken to identify records or potential occurrences of conservation significant flora and fauna species within the study area. The desktop assessment used the below databases and documents.

The Commonwealth Department of the Environment and Energy (DEE) Protected Matters search tool (PMST) was used to identify species and vegetation communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (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. The search area was defined by the latitude/longitude coordinates -25.67056, 152.79473 with a 10 km buffer.

Regional Ecosystems (REs) are vegetation communities that are consistently associated with a combination of geology, land form and soil in a bioregion. The Queensland Herbarium has mapped the remnant and pre-clearing extent of REs for much of the State using a combination of satellite imagery, aerial photography interpretation and on-ground studies. 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 study area. REs can be used to predict the occurrence of suitable habitat.

The Department of Natural Resources and Mines (DNRM) Regulated Vegetation Management Map dataset was used to determine areas that are assessable and non-assessable under the provisions of the VM Act.

The Queensland Department of Environment and Heritage Protection's (DEHP) Wildlife Online database was used to identify all species that have previously been recorded within the search area and reported to DEHP. Records were compiled for a search area defined by Neerdie State Forest 2, Tuan State Forest, Toolara State Forest and the adjacent Great Sandy National Park.

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.

2.1.1 Likelihood of Occurrence Assessment

An assessment was undertaken of the likelihood of occurrence for threatened species identified through the desktop review. The site reconnaissance further informed and verified this likelihood of occurrence assessment. The DEE and DEHP do not have prescriptive likelihood of occurrence guidelines within their policies but rather clarify the scale of assessment required to determine the level of impact (e.g. level of assessment, previous record searches, and distribution maps). The below criteria have been developed with the aim of considering this scale of assessment to identify the likelihood of occurrence for threatened species:

- **Low potential to occur** – the species has not been recorded in the region (no records from desktop searches) and/or current known distribution does not encompass project area and/or suitable habitat is generally lacking from the project area.
- **Moderate potential to occur** – the species has been recorded in the region (desktop searches) however suitable habitat is generally lacking from the project area or species has not been recorded in the region (no records from desktop searches) however potentially suitable habitat occurs at the project area.
- **High potential to occur** – the species has been recorded in the region (desktop searches) and suitable habitat is present at the project area.

- **Known to occur** – the species has been recorded on-site in the recent past (i.e. last 5-10 years) and the site provides suitable habitat for it.

2.2 Field Assessment

2.2.1 Site Reconnaissance

The site reconnaissance was conducted to gain a general understanding of the species, habitats and vegetation within the study area. The field survey also aimed to inform the likelihood of occurrence of threatened species or ecological communities considered to have the potential to occur in the study area (and broader scoping area), as identified by desktop searches (Federal listings under EPBC Act, or State listings under NC Act or VM Act). Verification was based on direct observations of species, habitats and vegetation, including soils, geology and landforms.

The survey also allowed identification of areas of least constraint within the study area.

2.2.2 Bird Surveys

Bird surveys were carried out on 8 December 2016, 12 January 2017 and 15 March 2017 at locations within the study area to gain a general understanding of species likely to be found within and flying above the study area. Sites were generally at elevated locations within pine plantations, following the general location criteria for turbines. Surveys were 20-minute point count surveys, recording birds observed visually or aurally within a 100 m radius of the central point. Surveys were conducted throughout the day to capture species that make use of thermals for soaring. This method is generally in accordance with the Level 1 Investigation protocol for initial bird utilisation surveys in the Interim Standards for Assessing the Risks to Birds from Wind Farms in Australia (Brett Lane & Associates Pty Ltd, 2005). One point count was conducted at each site. Photos were taken towards each cardinal direction, weather conditions were noted and a Garmin etrex 20 was used to record the location of the central point.

2.2.3 Flying Fox Survey

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. The locations of the flying-fox camps were informed by the DEE National Flying-fox Monitoring Viewer (Department of the Environment, 2015l) and DEHP 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.

2.3 Risk Assessment

Following desktop assessments and field surveys, a risk assessment was undertaken to evaluate the risk of impact to species and populations from the development. Refer to **Appendix B, Table 6 and Table 7** for risk assessment.

2.4 Nomenclature

Scientific names for terrestrial flora are consistent with those used in the Census of the Queensland Flora (Bostock & Holland, 2014) and botanical binomials presently accepted by the Queensland Herbarium (DSITI). An asterisk (*) preceding a species name indicates a non-native exotic species and a plus sign (+) indicates a non-indigenous native species, i.e. those native species that are well out of their natural range and have characteristics typical of weed species. The description of REs follows that of the Regional Ecosystem Description Database (REDD, Version 10.0 (Queensland Herbarium, 2016)).

Scientific and common names for terrestrial fauna follow those used in the following sources:

- Australian Faunal Directory (Department of Environment Water Heritage and the Arts, 2009a);
- Field Guide to Mammals of Australia (Menkhorst & Knight, 2004);
- A Complete Guide to Reptiles of Australia (Wilson & Swan, 2013);
- Field Guide to Australian Birds (PDA Solutions, 2012);
- Tadpoles and Frogs of Australia (Anstis, 2013); and
- A Field Guide to the Frogs of Australia (Tyler & Knight, 2009).

2.5 Qualifications

Paul Fox is the Principal Ecologist at Premise Environment (previously O2 Ecology) and was the lead ecologist and main author. Paul was the founding Director of O2 Ecology and prior to that, a senior ecologist at GHD, based on the Fraser Coast. He has over 16 years experience working within professional environmental consulting firms and has spent the past 10 years working professionally across the Wide Bay Burnett and Sunshine Coast. Paul has undertaken and project managed numerous environmental and ecological assessments across the Fraser Coast and Gympie Regional Council Local Government Areas (LGAs) including preparation of threatened Species Management Plans, threatened species habitat verification and Significant Residual Impact Assessments of disturbance on mapped threatened species essential habitat (Matters of State Environmental Significance (MSES)). Projects include:

- Project Manager and contributing author, Great Sandy Biosphere Links Project, Flora and Fauna International
- Lead Ecologist, Targeted Threatened Species Surveys and Assessment, Bruce Highway Upgrade, Cooroy to Curra Section C
- Project Manager, Gympie Threatened Species, Threatened Ecological Communities and Wildlife Corridor Mapping, Gympie Regional Council
- Project Manager, Koala Mapping for the Gympie Region, Gympie Regional Council
- Project Manager, Gympie Koala Conservation Management Plan, Gympie Regional Council
- Project Manager and field ecologist, Wide Bay Burnett Powerline Environmental Management Plan Project, Ergon Energy (including assessments in Tuan, Toolara and Neerdie State Forests)
- Project Manager, Noosa Koala Infrastructure Project, Noosa Council
- Lead Ecologist and author, Biodiversity Planning Study, Fraser Coast Planning Scheme, Fraser Coast Regional Council
- Project Manager and ecologist, Coastal Biodiversity Mapping Assessment, Fraser Coast Regional Council
- Project Manager, Roadside Vegetation Management Plan, Gympie Regional Council

3 EXISTING ENVIRONMENTAL VALUES

Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES) are summarised in Sections 3.1 and 3.2. Any projects that may have a significant impact on one or more MNES must be referred to the Federal Minister of the Environment and therefore do not form part of the MCU application.

3.1 Matters of National Environmental Significance (MNES)

Under the EPBC Act, actions that have, or are likely to have, a significant impact on a Matter of National Environmental Significance (MNES) require approval from the Australian Government Minister for the Environment. The nine matters of national environmental significance protected under the EPBC Act are:

- world heritage properties;

- national heritage places;
- wetlands of international importance (listed under the Ramsar Convention);
- listed threatened species and ecological communities;
- migratory species protected under international agreements;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mines); and
- a water resource, in relation to coal seam gas development and large coal mining development

Other matters protected by the EPBC Act include:

- the environment, where actions proposed are on, or will affect Commonwealth land and the environment; and
- the environment, where Commonwealth agencies are proposing to take an action.

The PMST report (**Appendix C**) indicates the matters of national environmental significance that may occur in, or may relate to, the search area.
There are no world heritage properties, national heritage places, wetlands of international importance or commonwealth marine areas and the study area is not within the Great Barrier Reef Marine Park.
There is potentially one listed threatened ecological community (TEC) (**Section 3.1.1**) within the study area.
49 listed threatened species and 12 listed migratory species (**Section 3.3**) or their habitats may occur within the search area.

3.1.1 Threatened Ecological Communities

Ecological communities are naturally occurring biological assemblages that occur in a particular type of habitat. Threatened ecological communities (TECs) are ecological communities that have been assessed and assigned to a particular category related to the status of the threat to the community at a national scale, i.e. extinct, critically endangered, endangered, vulnerable, and conservation dependant. TECs are protected under the EPBC Act.

Based on the PMST results (**Appendix C**) one critically endangered TEC, lowland rainforest of subtropical Australia, is considered likely to occur within the search area.

Lowland Rainforest of Subtropical Australia

This community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in New South Wales (NSW) on basalt and alluvial soils, typically more than 2 km from the coast. The moderately tall (⩾20 m) to tall (⩾30 m) closed forest (canopy cover ⩾70%) community commonly includes tree species with compound leaves and relatively large (notophyll to mesophyll) leaves. Buttresses and an abundance and diversity of vines are common. There is a relatively low abundance of species from the genera Eucalyptus, Melaleuca and Casuarina.

In Queensland, TECs are linked to certain REs which are identified in the listing advice of each TEC. This TEC is linked to RE 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.11.1, 12.11.10, 12.12.1 and 12.12.16. None of these REs are mapped within the study area.

The DOE Map of Threatened Ecological Communities shows indicative distributions of where TECs 'may' occur in Queensland. Although none of the linked REs are mapped in the study area, the DOE mapping indicates that this TEC may occur within the study area along Tinana Creek (**Figure 8**).

3.2 Matters of State Environmental Significance (MSES)

Matters of State Environmental Significance (MSES) are referenced in the biodiversity State interest under the State Planning Policy (SPP) and are mapped by the Queensland Government. The *Environmental Offsets Regulation 2014* also prescribes MSES for the purposes of the environmental offsets legislation in Queensland.

Many of the MSES in the *Environmental Offsets Regulation 2014* coincide with the MSES listed under the SPP, however, there are additional items listed under the *Environmental Offsets Regulation 2014* that are not listed in the SPP. The MSES mapping includes certain environmental values that are protected under Queensland legislation such as State conservation areas, marine parks, waterways and wetlands, protected habitat, fish habitat, regulated vegetation, connectivity areas and offset areas.

MSES defined under the SPP and *Environmental Offset Regulation 2014* include the following:

- protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* (NC Act)
- marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004*
- marine plants
- areas within declared fish habitat areas that are management A areas or management B areas under the *Fisheries Regulation 2008*
- waterways providing fish passage
- threatened wildlife under the NC Act and special least concern animal under the *Nature Conservation (Wildlife) Regulation 2006*
- regulated vegetation under the *Vegetation Management Act 1999* (VM Act) that is:
    - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems
    - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems
    - Category R areas on the regulated vegetation management map
    - areas of essential habitat on the essential habitat map for wildlife prescribed as 'endangered wildlife' or 'vulnerable wildlife' under the NC Act
    - regional ecosystems that intersect with watercourses identified on the vegetation management watercourse map
    - regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map
- high preservation areas of wild river areas under the *Wild Rivers Act 2005*
- connectivity areas containing remnant vegetation Category B as depicted in the Environmental Offset Landscape Connectivity Assessment Tool
- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Referable Wetlands under the *Environmental Protection Regulation 2008*
- Wetlands and watercourses in high ecological value waters defined in the *Environmental Protection (Water) Policy 2009*, schedule 2
- Legally secured offset areas

3.2.1 Wetlands and Waterways

The Queensland Wetlands Program defines wetlands as areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 m. To be a wetland the area must have one or more of the following attributes (Department of Environment and Heritage Protection, 2015):

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

Examples under this definition include:
- those areas shown as a river, stream, creek, swamp, lake, marsh, waterhole, wetland, billabong, pool or spring on the latest Sunmap 1:25,000, 1:50,000, 1:100,000 or 1:250,000 topographic map
- areas defined as wetlands on local or regional maps prepared with the aim of mapping wetlands
- wetland regional ecosystems (REs) as defined by the Queensland Herbarium
- areas containing recognised hydrophytes as provided by the Queensland Herbarium
- saturated parts of the riparian zone
- artificial wetlands such as farm dams
- water bodies not connected to rivers or flowing water such as billabongs and rock pools.

Examples under this definition exclude:
- areas that may be covered by water but are not wetlands per the definition
- floodplains that are intermittently covered by flowing water but do not meet the hydrophytes and soil criteria
- riparian zone above the saturation level.

The ecological significance and legislative status of wetlands are assessed at international, national and State scales. The Convention on Wetlands of International Importance (also known as the Ramsar Convention) is an intergovernmental treaty that provides a framework for national action and international cooperation on the conservation and wise use of wetlands. The Commonwealth EPBC Act protects Australian Ramsar wetlands as a MNES. Ramsar wetlands are also protected under the *Queensland Environmental Protection Act 1994* (EP Act).

The Directory of Important Wetlands in Australia (DIWA) identifies and classifies nationally important wetlands within three broad categories - marine and coastal zone wetlands, inland wetlands and human-made wetlands (Environment Australia, 2001). The directory and associated updates provide detailed descriptions of all DIWA wetlands.

At a State level, a comprehensive mapping exercise has been undertaken for wetlands of high ecological significance (HES) and general ecological significance (GES), collectively termed referable wetlands, across Queensland. Wetland Protection Areas (WPAs) are HES wetlands within Great Barrier Reef (GBR) catchments. WPAs include lacustrine and palustrine wetlands but not riverine wetlands. WPA mapping incorporates trigger areas, which are buffers of 500 m surrounding wetlands in non-urban areas and buffers of 100 m in urban areas. The SDAP State Code 9: Great Barrier Reef Wetland Protection Areas aims to protect, and where possible enhance, wetland values.
The Great Sandy Strait Ramsar site is located less than 10km from the nearest portion of the study area (**Figure 3**). It includes the Great Sandy Strait, Tin Can Bay, Tin Can Bay Inlet, parts of Fraser Island and the mainland. It is a sand passage estuary between the mainland and Fraser Island.

The coastal wetlands of Great Sandy Strait are of international significance for migratory birds, with 18 species listed under international migratory bird conservation agreements recorded within the Ramsar site (**Section 3.3.2**). The Strait is also used by turtle species, dugong and humpback whales. Threatened fish such as Oxleyan Pygmy Perch and Honey Blue-eye are also known to inhabit the area (Department of Environment and Energy, 2016).

There are a number of watercourses across the study area which are mapped as MSES wetlands (**Figure 4**). Some of these watercourses were observed during the site reconnaissance and most observed within the pine plantations were of low habitat value.

Figure 5 and **Figure 6** show waterways and wetlands within the study area mapped as Vegetation Management wetlands, Regulated Vegetation (intersecting a watercourse) and High Ecological Value Waters.

3.2.2 Regional Ecosystems

In Queensland, remnant vegetation is classified into REs, which are discrete vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. Each RE has a number that serves as a shorthand description of its characteristics and locations, for example, RE 12.5.10. The first number, 12, indicates the bioregion in which the RE is located, in this case the Southeast Queensland bioregion. The second number, 5, indicates the land zone on which the ecosystem is found, in this case Tertiary-early Quaternary loamy and sandy plains and plateaus. The third number, 10, is the ecosystem number and relates to the dominant vegetation, in this case *Eucalyptus latisinensis* and/or *Banksia aemula* low open woodland on complex of remnant Tertiary surface and Tertiary sedimentary rocks.

The Queensland Herbarium is responsible for mapping REs, using a combination of remotely sensed data sets and on-ground studies. Version 10 of the RE mapping is certified under the VM Act, includes both a VM Class (e.g. Endangered, Of Concern or Least Concern) and Biodiversity Status (e.g. Endangered, Of Concern or No Concern at Present), and maps the extent of remnant REs as of 2015. The currently available RE mapping over the study area is presented in **Figure 7** and **Table 1**.

Each RE is assigned a vegetation management class, which is based on its current and pre-clearing areal extent (how much of it remains) within a bioregion. The RE class definitions are set out in the VM Act and are defined as follows:

- Endangered:
    - If less than 10% of the pre-clearing extent remains; or
    - If 10-30% of the pre-clearing extent remains (if the remnant extent of the RE within the bioregion is less than 10,000 ha).
- Of Concern:
    - If 10-30% of the pre-clearing extent remains; or
    - More than 30% of the pre-clearing extent remains (if the extent of the RE within the bioregion is less than 10,000 ha).
- Least Concern:
    - If more than 30% of the pre-clearing extent remains; and,
    - If the remnant extent of the RE within the bioregion is more than 10,000 ha.

Furthermore, the DEHP assign a biodiversity status to REs according to the condition of the RE and its perceived threats, in addition to its pre-clearing and remnant extent. The biodiversity status is applicable under the *Environmental Protection Act 1994*. Under this process a RE is:

- Endangered if it has:
    - less than 10% of the pre-clearing extent unaffected by severe degradation and/or biodiversity loss[1]; or

[1] Floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example by loss of A horizon, surface expression of salinity, surface compaction, loss of organic matter or sheet erosion

    - 10 - 30% of the pre-clearing extent unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10 000 ha; or,
    - A rare[2] RE subject to a threatening process[3].
- Of Concern if it has:
    - 10 - 30% of the pre-clearing extent unaffected by moderate degradation[4] and/or biodiversity loss.
- No Concern at Present if it:
    - Does not meet the degradation criteria listed for Endangered and Of Concern REs.

Woody vegetation is mapped as remnant if it has never been cleared or, if previously cleared, where the dominant canopy has:

- >50% of the predominant canopy cover that would exist if the vegetation community were undisturbed; and
- >70% of the height of the predominant canopy that would exist if the vegetation community were undisturbed; and
- The same floristic species that would exist if the vegetation community were undisturbed.

This definition is known as the '50-70-species' criteria.

The study area is located within the Gympie Block, Burnett-Curtis Coastal Lowlands and Great Sandy sub-regions of the Southeast Queensland bioregion.

Of the 13 mapped remnant REs within the study area, one (1) is classed as Endangered, six (6) are classed as Of Concern and six (6) are classed as Least Concern under the provisions of the VM Act.

Table 1 Remnant REs mapped over the study area (Descriptions as per (Queensland Herbarium, 2016))

Mapped RE	Description	Short Description	VM Act Class	Biodiversity Status	Area (ha) in Study Area
n/a	Pine Plantation	Exotic pine plantation	n/a	n/a	3,060.74
n/a	Non-remnant	Non-remnant vegetation	n/a	n/a	49.52
12.5.4	*Eucalyptus latisinensis +/- Corymbia intermedia, C. trachyphloia subsp. trachyphloia, Angophora leiocarpa, Eucalyptus exserta woodland.* Other characteristic species include *Eucalyptus siderophloia, Lophostemon suaveolens, Melaleuca viridiflora var. viridiflora, M. quinquenervia, M. cheelii* and *Grevillea banksii.* Patches of *Allocasuarina luehmannii* or *Banksia oblongifolia* present locally and *Xanthorrhoea johnsonii* common in ground layer. Occurs on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments. (BVG1M: 9g)	*Eucalyptus latisinensis +/- Corymbia intermedia, C. trachyphloia subsp. trachyphloia, Angophora leiocarpa, Eucalyptus exserta* woodland on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments	Least Concern	Least Concern	32.50

[2] Pre-clear extent less than 1000 ha or patch size 100 ha and of limited extent across its range

[3] For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing, or infrastructure development

[4] Floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded

Mapped RE	Description	Short Description	VM Act Class	Biodiversity Status	Area (ha) in Study Area
	12.5.4a: Woodland of Melaleuca quinquenervia and/or *M. viridiflora var. viridiflora +/- Eucalyptus latisinensis, Corymbia intermedia, Angophora leiocarpa, E. exserta, Lophostemon suaveolens* and *M. nodosa*. Occurs on complex of remnant Tertiary surfaces and Cainozoic and Mesozoic sediments usually lower slopes. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 21a)				0.33
12.5.12	*Eucalyptus racemosa subsp. racemosa, E. latisinensis +/- Corymbia gummifera, C. intermedia, E. bancroftii, Melaleuca quinquenervia* woodland to open woodland with prominent heathy understorey. Other canopy species occasionally present include *E. robusta, Angophora leiocarpa* and *A. woodsiana*. Occurs on remnant Tertiary surfaces +/- Cainozoic and Mesozoic sediments. (BVG1M: 9g)	*Eucalyptus racemosa subsp. racemosa, E. latisinensis +/- Corymbia gummifera, C. intermedia, E. bancroftii* woodland with heathy understorey on remnant Tertiary surfaces	Of Concern	Of Concern	23.46
12.5.10	*Eucalyptus latisinensis* and/or *Banksia aemula* low open woodland *+/- Corymbia trachyphloia subsp. trachyphloia*. Diverse understorey of heath species. Occurs on complex of remnant Tertiary surfaces and Tertiary sedimentary rocks. (BVG1M: 29a)	*Eucalyptus latisinensis* and/or *Banksia aemula* low open woodland on complex of remnant Tertiary surface and Tertiary sedimentary rocks	Least Concern	Least Concern	7.79
12.9-10.4	Open forest to woodland with *Eucalyptus racemosa subsp. racemosa* locally prominent. Other species can include *Angophora leiocarpa, Eucalyptus seeana, E. siderophloia, Corymbia intermedia, E. tindaliae* with *Lophostemon suaveolens, Melaleuca quinquenervia, E. tereticornis* on lower slopes. Occurs on Cainozoic and Mesozoic sediments +/- remnant Tertiary surfaces. (BVG1M: 9g)	*Eucalyptus racemosa subsp. racemosa* woodland on sedimentary rocks	Least Concern	Least Concern	5.38
12.3.14	*Banksia aemula* low woodland +/- mallee eucalypt low woodland. Associated canopy species include *Eucalyptus latisinensis, Corymbia intermedia, E. robusta* and *Lophostemon confertus*. Occurs on Quaternary alluvial plains along coastal lowlands. (BVG1M: 29a)	*Banksia aemula* low woodland on alluvial plains usually near coast	Of Concern	Of Concern	3.89
12.3.12	*Melaleuca viridiflora var. viridiflora, Eucalyptus latisinensis* or *E. exserta +/- Melaleuca quinquenervia, Corymbia intermedia, E. tereticornis woodland.* Occurs on drainage lines along coastal lowlands. (BVG1M: 21a)	*Eucalyptus latisinensis* or *E. exserta, Melaleuca viridiflora var. viridiflora* woodland on alluvial plains	Least Concern	Least Concern	2.06
12.3.5	*Melaleuca quinquenervia* open forest to woodland. Understorey depends upon duration of water logging;	*Melaleuca quinquenervia* open forest on coastal alluvium	Least Concern	Least Concern	1.31

Mapped RE	Description	Short Description	VM Act Class	Biodiversity Status	Area (ha) in Study Area
	sedges and ferns, especially *Blechnum indicum,* in wetter microhabitats and grasses and shrubs in drier microhabitats. Ground layer species include the grasses *Leersia hexandra* and *Imperata cylindrica,* the sedges/rushes*, Baumea rubiginosa, Gahnia sieberiana, Lepironia articulata, Schoenus brevifolius* and *Schoenus scabripes* and the fern *Lygodium microphyllum.* Other tree species that may be present as scattered individuals or clumps include *Lophostemon suaveolens, Eucalyptus robusta, E. tereticornis, E. bancroftii, E. latisinensis, Corymbia intermedia, Melaleuca salicina, Livistona australis, Casuarina glauca, Endiandra sieberi. Melastoma malabathricum subsp. malabathricum, Glochidion sumatranum* and *Melicope elleryana* are often in understorey. Occurs on Quaternary alluvium in coastal areas. (BVG1M: 22a)				
12.5.14a	*12.3.14a: Eucalyptus racemosa subsp. racemosa* woodland to open forest. Other canopy species may include *Corymbia intermedia, C. gummifera, Eucalyptus latisinensis, E. tindaliae* and *Melaleuca quinquenervia.* Occurs on Quaternary alluvial plains in near coastal areas. (BVG1M: 9g)	*Banksia aemula* low woodland on alluvial plains usually near coast	Of Concern	Of Concern	0.33
12.3.11	*Eucalyptus tereticornis +/- E. siderophloia* and *Corymbia intermedia* open forest to woodland. *Corymbia tessellaris, Lophostemon suaveolens* and *Melaleuca quinquenervia frequently* occur and often form a low tree layer	*Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains usually near coast	Of concern	Of concern	1.00
12.5.9	Sedgeland to heathland often with emergent *Eucalyptus latisinensis.* Characteristic shrubs include *Leptospermum spp., Leucopogon spp., Ricinocarpos pinifolius, Strangea linearis, Brachyloma daphnoides, Persoonia virgata, Xanthorrhoea spp., Styphelia viridis, Monotoca scoparia, Woollsia pungens* and stunted *Allocasuarina littoralis.* Includes minor seepage areas containing *Banksia robur* and *Xanthorrhoea fulva.* Occurs on complex of remnant Tertiary surfaces and Tertiary sedimentary rocks. Lower slopes. (BVG1M: 29a).	Sedgeland to heathland in low lying areas on complex of remnant Tertiary surface and Tertiary sedimentary rocks	Of concern	Of concern	0.28
12.3.4	Open forest to woodland of *Melaleuca quinquenervia* and *Eucalyptus robusta.* Occurs fringing drainage lines and on	*Melaleuca quinquenervia, Eucalyptus robusta* woodland on coastal alluvium	Of concern	Of concern	0.15ha

Mapped RE	Description	Short Description	VM Act Class	Biodiversity Status	Area (ha) in Study Area
	floodplains in coastal areas. (BVG1M: 22a) Vegetation communities in this regional ecosystem include: 12.3.4a: Palustrine wetland (e.g. vegetated swamp). *Eucalyptus bancroftii* open woodland often with *Melaleuca quinquenervia*. Occurs on drainage lines and floodplains in coastal areas. (BVG1M: 22a)				
12.3.13	Closed or wet heathland. Characteristic species include *Melaleuca thymifolia, Banksia robur, Xanthorrhoea fulva, Hakea actites, Leptospermum spp.* and *Baeckea frutescens*. Occurs on seasonally waterlogged Quaternary alluvial plains along coastal lowlands. (BVG1M: 29a)	Closed heathland on seasonally waterlogged alluvial plains usually near coast	Least concern	Of concern	0.01
12.5.6c	*Eucalyptus pilularis* open forest +/- *E. siderophloia, E. propinqua, Corymbia intermedia, E. microcorys, E. acmenoides, E. tereticornis, E. biturbinata, Lophostemon confertus* with *E. saligna, E. montivaga at higher altitudes. Occurs on remnant* Tertiary surfaces. Usually deep red soils. (BVG1M: 8b)	*Eucalyptus siderophloia, E. propinqua, E. microcorys* and/or *E. pilularis* open forest on remnant Tertiary surfaces. Usually deep red soils	Endangered	Endangered	0.10

3.2.3 Essential Habitat

To manage clearing and prevent loss of biodiversity, the DEHP has mapped areas designated as essential habitat for species listed as Endangered, Vulnerable or Near Threatened (EVNT) under the NC Act. Essential habitat (EH) mapping identifies sites and locations considered to contain important habitat for flora and fauna species of conservation significance. It is only mapped over remnant or mature regrowth vegetation, and is based on either confirmed sightings or records of a species of conservation significance breeding or using major habitat resources in that location (e.g. for shelter or feeding resources), or known suitable habitat or resources for a species of conservation significance occurring at a location, or habitat that forms part of a potentially important corridor for a species of conservation significance. Where EH mapping is based on confirmed sightings, the sighting point is buffered by one kilometre, and includes all remnant vegetation within the buffer that meets the requirements of that species.

Areas of EH for Wallum froglet (*Crinia tinnula*) and Wallum rocketfrog (*Litoria freycineti*) which are listed as vulnerable under the NC Act, are mapped within remnant vegetation in the study area (**Figure 9**). Some small areas of EH for ground parrot (*Pezoporus wallicus wallicus)* which is listed as Vulnerable under the NC Act, are mapped in the northern portion of the study area.

3.3 Conservation Significant Species

Conservation significant flora and fauna species are those species listed under the provisions of the Commonwealth EPBC Act and/or the Queensland Nature Conservation (Wildlife) Regulation 2006, the

regulation to the NC Act, including threatened (EVNT) species as well as internationally protected wildlife and migratory species.
The search areas for the purposes of this assessment are large and therefore encompass many conservation significant species that are either known or predicted to occur. Not all the threatened species indicated through desktop information are expected to occur within the study area due to the absence of suitable habitat for some species. **Table 6** lists the threatened and migratory fauna and threatened flora species that are at least moderately likely to occur within or immediately adjacent to the study area according to the definitions in **Section 2.1.1**. **Figure 11** shows potential habitat for threatened and special least concern species.

3.3.1 State Conservation Significant Species

Amphibians

Of the five State listed threatened amphibian species known or predicted to occur, four have previously been recorded in Tuan or Toolara State Forests. All four are listed under the NC Act. Refer to **Appendix B, Table 6** for likelihood of occurrence and further risk assessment.

During the site reconnaissance, most of the creeks within the pine plantations were observed to be of low habitat value with exotic fish species such as Gambusia observed. The creeks are not considered to be core habitat for the listed frog species due to poor water quality and degradation of previously (pre-pine plantation) suitable habitat.

- Tuan State Forest - wallum rocketfrog *Litoria freycineti,* wallum froglet *Crinia tinnula*
- Toolara State Forest – wallum sedgefrog *Litoria olongburensis,* wallum rocketfrog *Litoria freycineti,* Cooloola sedgefrog *Litoria cooloolensis,* wallum froglet *Crinia tinnula*
- Neerdie State Forest 2 – no previous records

Reptiles

Marine reptiles such as marine turtles have been excluded from this assessment as no suitable habitat exists within the study area.
Of the six State listed threatened reptile species known or predicted to occur, one species has previously been recorded from State Forests in the broader scoping area. Refer to **Appendix B, Table 6** for likelihood of occurrence and further risk assessment.

- Tuan State Forest - white-throated snapping turtle *Elseya albagula*
- Toolara State Forest - white-throated snapping turtle *Elseya albagula*
- Neerdie State Forest 2 – no previous records

Mammals

Of the eight State listed threatened mammal species known or predicted to occur, four species have previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest - southern greater glider *Petauroides volans volans,* short-beaked echidna *Tachyglossus aculeatus* and water mouse *Xeromys myoides*
- Toolara State Forest - koala *Phascolarctos cinereus*
- Neerdie State Forest 2 - no previous records

The short-beaked echidna is listed under the NC Act as special least concern, whilst the other three previously recorded threatened mammal species are listed as vulnerable under the NC Act.

No suitable habitat for southern greater glider *Petauroides volans volans* or koala *Phascolarctos* cinereus occurs in the study area, other than the small scattered remnant patches of eucalypt dominated REs, of which there is little to no connectivity between remnant patches. No suitable habitat for water mouse *Xeromys myoides* was observed during the site surveys within the study area.
Two further threatened mammal species (little-pied bat *Chalinolobus picatus* and platypus *Ornithorhynchus anatinus*) have not previously recorded within Neerdie State Forest 2, Toolara or Tuan State Forests but are considered to have a moderate potential to occur. The platypus is listed as special least concern under the NC Act and may occur in Tinana Creek. The little-pied bat is listed as near threatened under the NC Act and may occur in the adjacent Great Sandy National Park (roosting in hollows).
Refer to **Appendix B, Table 6** for likelihood of occurrence and further risk assessment.

Fish

Of the two State listed threatened fish species known or predicted to occur, one has previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest – no previous records
- Toolara State Forest - Oxeleyan pygmy perch *Nannoperca oxleyana*
- Neerdie State Forest 2- no previous records

Oxeleyan pygmy perch is listed as vulnerable under the NC Act.

One other State listed threatened fish species is considered to have a moderate potential to occur (honey blue eye *Pseudomugil mellis*) which is listed as vulnerable under the NC Act. Refer to **Appendix B, Table 6** for likelihood of occurrence and further risk assessment.

Birds

Excluding migratory birds, of the 11 State listed threatened bird species known or predicted to occur, two have previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest – Glossy Black Cockatoo (GBC) *Calyptorhynchus lathami lathami* (eastern subspecies) and powerful owl *Ninox strenua*.
- Toolara State Forest – no previous records
- Neerdie State Forest 2- no previous records

Both birds are listed as vulnerable under the NC Act.
Gympie is considered the northern range for this GBC sub-species (Curtis & Dennis, 2012). The Tuan State Forest (36km north of Gympie) record is likely historic as past clearing for plantations has caused local extinctions and range contractions (Curtis & Dennis, 2012). GBCs are rarely found away from Allocasuarina or Casuarina (she-oak) trees, which provide their primary food source (The Glossy Black Conservancy, 2014).
Powerful Owls may potentially utilise 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.
Two other State listed threatened bird species (Square-tailed Kite *Lophoictinia isura* (NT – NC Act) and Black-necked Stork *Ephippiorhynchus asiaticus* (NT- NC Act)) are considered to have a moderate potential to occur (as flyover species) based on suitable regional habitat and previous records in the adjacent

Great Sandy National Park. Refer to **Appendix B, Table 6** for likelihood of occurrence and additional risk assessments.

Flora

Of the 13 State listed threatened flora species known or predicted to occur, eight have previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest – Pineapple Zamia *Macrozamia pauli-guilielmi*, *Acacia attenuata,* Wide Bay boronia *Boronia rivularis,* Quassia *Samadera bidwillii*
- Toolara State Forest - Pineapple Zamia *Macrozamia pauli-guilielmi*, *Acacia attenuata,* Bacon wood *Archidendron lovelliae,* Southern Penda *Xanthostemon oppositifolius,* Key's boronia *Boronia keysii,* Wide Bay boronia *Boronia rivularis, Pterostylis sp. (Toolara R.Crane 1322)* (orchid)
- Neerdie State Forest 2- Pineapple Zamia *Macrozamia pauli-guilielmi*

Three of these species (Bacon wood *Archidendron lovelliae*, Quassia *Samadera bidwillii* and Southern Penda *Xanthostemon oppositifolius*) grow in riparian communities associated with notophyll vine forest, transitional rainforest or tall sclerophyll forests with rainforest species. This habitat is restricted to areas along Tinana Creek in the western portion of the study area. *Fontania rostrata,* listed as vulnerable under the NC Act has also previously been recorded from vine forest along Tinana Creek.
Acacia attenuata, listed as vulnerable under NC Act, has previously been recorded from Tuan and Toolara State Forest and is known to occur in disturbed areas subject to vegetation control (Department of the Environment, 2015a). This species occurs at altitudes lower than 30m above sea level (ASL) and therefore is not expected to occur on the elevated areas proposed for turbine locations.

Boronia keysii, listed as vulnerable under both the EPBC Act and NC Act, occurs at altitudes less than 20m ASL. It is found in mixed eucalypt forests. Although previously recorded in Toolara State Forest, no suitable habitat was observed during the site reconnaissance.

Pineapple Zamia (*Macrozamia pauli-guilielmi*), listed as endangered under NC Act, has previously been recorded within Toolara, Tuan and Neerdie State forests and potential habitat exists in the remnant eucalypt or heath vegetation on site. Historically, the major threat for pineapple zamia has been clearing for agriculture and pine plantations. Habitat loss remains a threat on freehold land and road reserves, with proposed road corridors in the Poona, Tuan State Forest and Cooloola Way road systems, and quarrying in the vicinity of Tuan State Forest (Department of the Environment, 2016c). The survival of individuals growing within pine plantations is unlikely as the ground is 'ripped and mounded' prior to planting a crop. New management practices have been implemented to minimise the impact of forestry practices on cycads within Queensland State Forests (Department of the Environment, 2016c).

3.3.2 Commonwealth Conservation Significant Species

Amphibians

Of the two Commonwealth listed threatened amphibian species known or predicted to occur, one (wallum sedge frog *Litoria olongburensis)* has previously been recorded from the State Forests in the broader scoping area.

Tuan State Forest – no previous records
Toolara State Forest - wallum sedge frog *Litoria olongburensis*
Neerdie State Forest 2 – no previous records

Wallum sedge frog is listed as vulnerable under the EPBC Act.

Reptiles

Of the three Commonwealth listed threatened reptile species known or predicted to occur, one (white-throated snapping turtle *Elseya albagula)* has previously been recorded from the State Forests in the broader scoping area.

Tuan State Forest - white-throated snapping turtle *Elseya albagula*
Toolara State Forest - white-throated snapping turtle *Elseya albagula*
Neerdie State Forest 2 – no previous records

The white-throated snapping turtle *Elseya albagula* is listed as critically endangered (CE) under the EPBC Act.

Mammals

Of the seven Commonwealth listed threatened mammal species known or predicted to occur, three (southern greater glider *Petauroides volans volans,* koala *Phascolarctos cinereus* and water mouse *Xeromys myoides)* have previously been recorded from the State Forests in the broader scoping area.

Tuan State Forest: southern greater glider *Petauroides volans Volans,* and water mouse *Xeromys myoides*
Toolara State Forest: koala *Phascolarctos cinereus*
Neerdie State Forest 2: no previous records

Grey-headed flying fox camps (colonial roost sites) are known to occur in the region, adjacent to the broader scoping area.

All four mammal species are listed as vulnerable under the EPBC Act.

Grey-headed flying fox

There are 17 previously recorded flying-fox camps adjacent (within 50 km) to the broader scoping area. No known camps have been recorded within the broader scoping area or study area (**Figure 12**).
Other non-threatened flying fox species which occur in the region and may fly over the study area are black flying-foxes *Pteropus alecto* and little red flying-foxes *Pteropus scapulatus*. Black and grey-headed flying foxes are highly colonial and share camp sites (which they segregate spatially). Little red flying foxes irregularly occupy camps used by grey-headed flying foxes (NSW Department of Environment Climate Change and Water, 2009).
When camps are undisturbed, their locations are generally stable through time. However, camp size fluctuates and many camps are empty for extensive periods (NSW Department of Environment Climate Change and Water, 2009). Grey-headed Flying-foxes are partial migrants: some individuals migrate whereas others are sedentary.

Fish

Of the four Commonwealth listed threatened fish species known or predicted to occur, two (Mary River cod *Maccullochella mariensis* and Oxeleyan pygmy perch *Nannoperca oxleyana)* have previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest – Mary River cod *Maccullochella mariensis*

- Toolara State Forest - Mary River cod *Maccullochella mariensis* and Oxeleyan pygmy perch *Nannoperca oxleyana*
- Neerdie State Forest 2- Mary River cod *Maccullochella mariensis*

Oxeleyan pygmy perch *Nannoperca oxleyana* and Mary River cod *Maccullochella mariensis)* are both listed as endangered under the EPBC Act

Two other threatened species are considered to have a moderate potential to occur (Australian lungfish *Neoceratodus forsteri (*Tinana Creek only) and honey blue eye *Pseudomugil mellis*). Both species are listed as vulnerable under the EPBC Act.

Birds

Of the 10 Commonwealth listed threatened bird species (excluding migratory) known or predicted to occur, none have previously been recorded from State Forests in the broader scoping area.

Migratory Birds

Shorebirds (waders) inhabit intertidal areas and/or freshwater wetlands. Thirty-four (34) shorebirds are migratory and breed in northern China, Mongolia, Siberia and Alaska birds (Department of Environment and Heritage Protection, 2016b) and Russia and migrate to non-breeding grounds in Australia along the East Asian – Australasian (EAA) flyway. They present a conservation challenge because their movement patterns take them across international boundaries, using different countries at different times of the year (Department of Environment Water Heritage and the Arts, 2009b).

Internationally important sites and current flyway population estimates have been identified by Bamford et al. (2008) in *Migratory shorebirds of the East Asian–Australasian Flyway: Population estimates and internationally important sites*.

The identification of important sites is based on Criterion 6 of the Ramsar Convention, which states that "a wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbirds" (Bamford M, Watkins D, Bancroft W, 2008). Australia has 118 internationally important sites (Bamford M, Watkins D, Bancroft W, 2008). The Great Sandy Strait is considered an internationally important site for the following seven (7) migratory species (Bamford M, Watkins D, Bancroft W, 2008):

- Terek sandpiper (*Xenus cinereus)*
- Grey-tailed tattler (*Tringa brevipes)*
- Common greenshank (*Tringa greenshank)*
- Bar-tailed godwit (*Limosa lapponica baueri* and *Limosa lapponica menzbieri)*
- Lesser sand plover (*Charadrius mongolus)*
- Whimbrel (*Numenius phaeopus*)
- Far eastern curlew (*Numenius madagascariensis*)

The Great Sandy Strait Ramsar area is approximately 5km from the nearest portion of the study area (other than Poona Creek which is approximately 500m away from the nearest turbine corridor). Whilst the study area is not considered to be 'important habitat' under the EPBC Act, a conservative approach would consider the Great Sandy Strait Ramsar area as constituting a 'nearby area' and an assessment of the migration and movement pathways is therefore recommended. When considering an EPBC Act referral, a 'site' is defined for migratory birds as:

> *"the entire (discrete) area of contiguous habitat used by the same group of migratory shorebirds, which may include multiple roosts and feeding areas"*. The area covered by a migratory shorebird 'site' may extend beyond the boundaries of a property or project area, and may also extend beyond Ramsar boundaries for internationally important areas. Appropriate surveys can

determine the extent of a migratory shorebird 'site' (Department of Environment Water Heritage and the Arts, 2009b).

The PMST search results indicate that 16 migratory species (excluding albatross due to their specific pelagic marine habitat requirements) are either known or are predicted to occur within the study area. Of these 16 species, four are either known to occur or have been directly observed flying over the project area (Fork-tailed swift *Apus pacificus,* White-bellied sea-eagle *Haliaeetus leucogaster,* White-throated Needletail *Hirundapus caudacutus* and Rainbow bee-eater *Merops ornatus*). Another six species are considered to have a moderate potential to occur. Refer to **Appendix B, Table 6** for likelihood of occurrence and further risk assessments.

Flora

Of the 15 Commonwealth listed threatened flora species known or predicted to occur, six have previously been recorded from State Forests in the broader scoping area.

- Tuan State Forest – Pineapple Zamia *Macrozamia pauli-guilielmi*, *Acacia attenuata,* Quassia *Samadera bidwillii*
- Toolara State Forest - Pineapple Zamia *Macrozamia pauli-guilielmi*, *Acacia attenuata,* Bacon wood *Archidendron lovelliae,* Southern Penda *Xanthostemon oppositifolius* and Key's boronia *Boronia keysii.*
- Neerdie State Forest 2- Pineapple Zamia *Macrozamia pauli-guilielmi*

Three of these species (Bacon wood *Archidendron lovelliae*, Quassia *Samadera bidwillii* and Southern Penda *Xanthostemon oppositifolius*) grow in riparian communities associated with notophyll vine forest, transitional rainforest or tall sclerophyll forests with rainforest species. This habitat is restricted to areas along Tinana Creek in the western portion of the study area. *Fontania rostrata,* listed as vulnerable under the EPBC Act has also previously been recorded from vine forest along Tinana Creek.

Acacia attenuata, listed as vulnerable under the EPBC Act, has previously been recorded from Tuan and Toolara State Forests and is known to occur in disturbed areas subject to vegetation control (Department of the Environment, 2015a). This species occurs at altitudes lower than 30m above sea level (ASL) and therefore is not expected to occur on the elevated areas proposed for turbine locations.

Boronia keysii, listed as vulnerable under the EPBC Act, occurs at altitudes less than 20m ASL. It is found in mixed eucalypt forests. Although previously recorded in Toolara State Forest, no suitable habitat was observed during the site reconnaissance.

Pineapple Zamia (*Macrozamia pauli-guilielmi*), listed as endangered under the EPBC Act, has previously been recorded within Neerdie, Tuan and Toolara State forests and potential habitat exists in the remnant eucalypt or heath vegetation on site. Historically, the major threat for pineapple zamia has been clearing for agriculture and pine plantations. Habitat loss remains a threat on freehold land and road reserves, with proposed road corridors in the Poona, Tuan State Forest and Cooloola Way road systems, and quarrying in the vicinity of Tuan State Forest (Department of the Environment, 2016c). The survival of individuals growing within pine plantations is unlikely as the ground is 'ripped and mounded' prior to planting a crop. New management practices have been implemented to minimise the impact of forestry practices on cycads within Queensland State Forests (Department of the Environment, 2016c). Refer to Table 7 for likelihood of occurrence and additional risk assessments.

Protected Plants

Some areas within the larger study area have been mapped within a high-risk area on the DEHP Protected Plants Flora Survey Trigger Map. Should clearing be required within these areas, a pre-construction survey will be required to meet the requirements of the Flora Survey Guidelines.

If no protected plants are found within the clearing impact area, defined as the area to be cleared as well as a buffer area of 100 m around the clearing, the Protected Plants Survey report can be submitted with an exempt clearing notification (protected plants) application form to DEHP.
If a flora survey identifies that EVNT plants are present within the clearing impact area, a clearing permit will be required. As per the Protected Plant Survey Guidelines, the survey must also include a 100m buffer (clearing impact area) Refer to **Figure 13** for high risk areas within the study area.

4 FIELD ASSESSMENT RESULTS

4.1 Habitat Descriptions

The Pine Plantations are of lowest habitat value within the study area and within the general Gympie and Fraser Coast regions. A mosaic of native vegetation, often with little to no connectivity, occurs throughout the pine plantations. These areas are generally associated with mapped waterways.

Table 2 Site Features

Habitat Description	Plate
Exotic Pine Plantation Pine plantations are considered low habitat value. Some infestations of lantana (weed of national significance (WONS) were observed in the plantations. Feral horses were observed in the plantations.	
Linear vegetation remaining along mapped waterway In some cases, a narrow riparian layer of low habitat value exists along waterways and drainage lines.	

Habitat Description	Plate
Linear vegetation along waterway As per above. Back left of picture shows 1-tree linear line of regrowth, remaining along a mapped waterway	
Native vegetation within plantation A mosaic of narrow remnant patches of native vegetation intersect the pine plantations. Small patch of *E. racemosa* woodland in center of picture, with pine plantations on either side.	
Large cleared areas The scoping area is a mosaic of juvenile to mature exotic pine plantation. Pine plantations are cleared on an approximate 30 year cycle.	
Tributary of Tinana Creek Waterway under Andrew Morris Bridge in western portion of Scoping Area. Degraded tributary which flows into Tinana Creek. Waterway degradation from feral horses was observed.	

4.2 Bird Survey

One point count was conducted at each of 11 sites (**Figure 16**). In total, 38 bird species were observed, including white-throated needletail (*Hirundapus caudacutus*) and rainbow bee-eater (*Merops ornatus*), listed as Migratory under the EPBC Act. The species list and survey time for each site is presented in **Appendix D**.

The highest richness was recorded at sites PC1-2, PC1-1, PC2-2 and PC1-4 with 13, 12, 12 and 11 species respectively. The lowest richness was recorded at sites PC1-3 and PC2-7 with 4 species each. The difference in richness may have been attributed to a combination of time of day, temperature, weather and habitat type.

Table 3 Number of individuals and flying height

		Flight Height (m above ground level)[1]									
Species	**Common Name**	**5**	**12**	**15**	**25**	**30**	**25-50**	**60**	**50-100**	**100**	**20-150**
Haliastur sphenurus	Whistling kite									1	
Hirundapus caudacutus	White-throated needletail							17	327		56
Coracina novaehollandiae	Black-faced cuckoo-shrike				1						
Corvus orru	Torresian crow		2								
Meliphaga lewinii	Lewin's honeyeater	1			2						
Merops ornatus	Rainbow bee-eater				2	2	6				
Dicaeum hirundinaceum	Mistletoebird			1							
Trichoglossus haematodus	Rainbow lorikeet			2	2						
	Total species	**1**	**2**	**3**	**7**	**2**	**6**	**17**	**327**	**1**	**56**

[1] – the lowest rotar sweep is more than 70m above ground level, avoiding most birds observed.

Eight species were recorded as flying at heights above ground level shown in **Table 3** during point counts. The raptor and swift species were recorded flying at the greatest heights above areas of cleared or regrowth pine plantation to 3m. Rainbow bee-eaters were observed at heights up to 50m in similar open habitat.

4.3 Flying-Fox Survey

Fourteen of the 17 historical flying-fox camps identified during the desktop assessment were observed. Of the 3 camps not observed, one (Sunshine Acres, 25km north of the scoping area) has reported no records of flying-fox activity since 2015, the second site (Dinnies Creek) was not accessible, however also reported no records during the August 2015 census survey and the third (Gympie) has been regularly surveyed since 2012 as part of the National flying-fox census. Of the 14 historical camps surveyed, 12 camps were not active and 2 camps contained both grey-headed (*Pteropus poliocephalus*) and black (*Pteropus alecto*) flying-foxes. Survey notes are contained in **Appendix D**.

The Kent Street active camp (Kent Street, Maryborough) is concentrated along the shore on the east of the Tiger Street-Odessa Street Bridge on the southern side of the Mary River. A few flying foxes were on the western side of the bridge. Deaths, including young flying-foxes, were observed and the total camp size was category 1 (1-499) for grey-headed flying-foxes and category 3 (2,500-9,999) for black flying-foxes. The Kent street colony is approximately 13km to the northwest of the closest turbine corridor which is off the Maryborough -Cooloola Road and approximately 50km from the furthest turbine.

The Goomboorian active camp (Goomboorian, Anderleigh Rd, Ginger Creek) is the closest active camp to the study area and is located north of Anderleigh Road along Ginger Creek at the intersection of Anderleigh Road and Tin Can Bay Road. It is approximately 8km south of the nearest turbine corridor.

The total camp size was category 3 (2,500-9,999) for grey-headed flying-foxes and category 1 (1-499) for black flying-foxes. The flying-foxes were observed from Anderleigh Road leaving the camp at dusk and the majority of individuals proceeded away from the study area in a westerly direction, bearing south-westwards along Ginger Creek or northwards across the cleared pasture, presumably to areas of native bushland such as Neerdie State Forest.

5 POTENTIAL IMPACTS

The construction and ongoing operation of the Forest Wind project within the study area has a low potential to impact on the nature conservation values of the area. The study area is located within exotic pine plantations that retain small areas of fragmented remnant vegetation. The Project (i.e. project infrastructure) within the study area will aim to avoid environmentally sensitive areas (ESA) such as remnant vegetation, essential habitat and watercourses / wetlands. Whilst the study area is expansive, the disturbance footprint for the Project is small.

5.1 Construction Phase

The construction phase of the Forest Wind project will involve construction of the wind turbines and associated infrastructure such as the collector system and manufacturing compounds.

Whilst Project infrastructure will be strategically placed within the pine plantations, away from ESA, some minor vegetation and habitat removal will occur.

5.1.1 Potential Impacts to Remnant Vegetation

The project will cause only a very minor amount of disturbance to native vegetation and habitat due to being able to locate the turbines outside of ESA. In general, forestry tracks will be used and upgraded if required. Some minor widening of existing track intersections may be required to allow turning space during construction if / when required.

Areas of vegetation disturbance has been calculated for the whole study area on a worst-case scenario in terms of impact. Areas in **Table 4** have been calculated based on potential turbine corridors and potentially locating the turbine anywhere within a corridor (outside of remnant vegetation and ESA). Similarly, it has been assumed that a 10m wide collector system powerline corridor may be placed anywhere within the turbine corridors, although micro-siting of these will also aim to avoid ESA such as remnant vegetation and wetland protection areas.

Table 4 Areas of Vegetation within Study Area

	Area (ha)				
RE v10	**Turbine Corridors**	**Powerline to Laminex**	**Cooloola Maryborough Rd Powerline (HV)**	**Culvert upgrades (100m buffer). 14 identified potential culvert upgrades**	**Bridge upgrades (100m buffer). 3 identified potential bridges**
Endangered (dom)	0.1	0	0	0.08	0.05
Endangered (sub-dom)	0.48	0	0	0	0.78
Non-remnant	49.52	0.66	4.52	3.01	0
Not of Concern	13.62	0	3.99	0	0

Of Concern (dom)	28.53	0.56	0	3.2	1.5
Of Concern (sub-dom)	35.76	0	0	0.03	0
Plantation	3,059.74	4.97	43.23	4.65	0

Areas for construction infrastructure such as laydown areas and manufacturing facilities will be located outside of ESA.

Disturbance to Threatened Ecological Communities

Vegetation along Tinana Creek has been identified as the one (1) location within the study area with Lowland Tropical Rainforest identified as 'likely to occur' by the DOE mapping (Ecological communities of National environmental significance TEC (Nov 2016), DOE). The turbine corridor intersects 5.87 ha of the area identified with TEC as 'likely to occur'. Two (2) potential bridge upgrades (Golden Gate Bridge and Urillah Creek) are within the DOE TEC 'likely to occur' mapping. Both bridges are on Tinana Creek.

Disturbance to Pine Plantations and Non-remnant

As the project has been designed to avoid ESA, the largest area of vegetation disturbance is within the pine plantations and non-remnant areas.

Disturbance to Threatened Flora

Some locations within the study area trigger the high-risk area on the Protected Plants Flora Survey Trigger Map. A protected plants survey in accordance with the Flora Survey Guidelines – Protected Plants, will be required prior to clearing for infrastructure within these areas. Surveys must be undertaken within 12 months of proposed clearing.

5.1.2 Clearing within Waterways and VM Wetlands

All turbines are located in elevated positions and away from wetland protection areas. Powerlines are expected to span creek crossings.
As per Table 5, areas of vegetation disturbance within the study area has been calculated on a worst-case scenario in terms of impact.

Table 5 Areas of Corridors and Infrastructure Intersecting Waterways and Wetlands

	Area (ha)				
	Turbine Corridors	**Powerline to Laminex**	**Cooloola Maryborough Rd Powerline (HV)**	**Culvert upgrades (100m buffer). 14 identified potential culvert upgrades**	**Bridge upgrades (100m buffer). 3 identified potential bridges**
VM Wetlands (v2.43)	1.24	0	3.25	0	0
MSES Regulated Vegetation 100m from Wetland	4.99	0	3.25	0.33 (1 culvert (unnamed watercourse))	0
MSES HEV Waterways	3.5km	33m	0	0	0

MSES Regulated Vegetation Intersecting a Watercourse	5.9km	35m	543m	6 culverts	3 bridges

5.1.3 Potential Impacts to Fauna

Potential impacts associated with construction that may affect fauna and fauna habitat values of the study area are detailed below.

- Direct loss of fauna habitat and resources as a result of vegetation clearing
- Loss of connectivity
- Direct mortality impacts to terrestrial fauna
- Alteration of fauna behaviour and habitat use resulting 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 study area 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 significant threat to local populations.

Habitat Loss

The proposed clearing footprint for the turbine construction phase requires a total area of land disturbance of 300 ha. The proposed clearing footprint for turbines for the operation phase is 75ha. All of this is within exotic pine plantations. This represents the majority of the clearing with minor clearing proposed for the collector system, collector substations, culvert, bridge and access track upgrades.

Loss of Connectivity

Landscape fragmentation and loss of connectivity is not considered significant as the study area consists largely of exotic pine plantations. Turbines and associated infrastructure is largely located outside of native vegetation and existing high value habitat.

The riparian habitats throughout the pine plantations are generally degraded although they do provide the best opportunities for habitat connectivity through the plantation landscape. Unfortunately most of the riparian habitats have poor connectivity to other waterway riparian habitats within the broader scoping area.

5.1.4 Aquatic Flora and Fauna

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

- Clearing of riparian vegetation and removal of topsoils from turbine locations and laydown areas and stockpiling of overburden on site resulting in sediment movement through overland flow
- Loss/degradation of habitat availability and/or suitability for aquatic species
- 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
- temporary alteration of Tinana Creek due to bridge upgrades

5.2 Operation Phase

5.2.1 Environmentally Sensitive Areas

The ESAs that could potentially be impacted upon by the Project operations include the remaining remnant RE's, wetlands and waterways near associated infrastructure. The potential impacts are not considered significant and are limited to:

- Increasing the abundance of weed species
- Increased risk of weed spread

5.2.2 Potential Impacts to Vegetation and Flora

Potential for impacts on flora during the operation phase of the Project are not considered significant and are limited to:

- Increasing the abundance of weed species
- Increased risk of weed spread

5.2.3 Potential Impacts to Fauna

Terrestrial Fauna

Remnant patches of vegetation, creeks and any native riparian vegetation remaining provides important corridors and habitat through the landscape of exotic pine. Potential operational impacts include increased human activity, visual effects, shadow flicker, macro and micro-climate change. There have been few studies of these potential impacts on terrestrial fauna although given most of the landscape consists of exotic pine plantations, which is largely depauperate of native terrestrial fauna, impacts are considered low and not significant.

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), they may be at risk of collision or barotrauma.

One (1) threatened micro-bat species, Little pied bat *Chalinolobus picatus* (NC Act – NT) is considered to have a moderate potential to occur. There are no records in the study area (or broader project area) although suitable habitat occurs in adjacent remnant vegetation to the east. If present, these bats and other micro-bat species are expected to forage within vegetated areas along creek lines / flyways which are at a lower topographic position that the wind turbines. The proposed height of the towers and difference in topographic position to the flyways creates a significant separation distance. This is considered to reduce the likelihood of collision and baratrauma and therefore the risk is considered low.

Three species of flying-fox may occur in the project area (black flying-foxes *Pteropus Alecto*, little red flying-foxes *Pteropus scapulatus* and grey-headed flying-fox *Pteropus poliocephalus)*. Grey-headed flying foxes are threatened (EPBC Act – V).
There are 17 previously recorded flying-fox camps within 50km of the broader scoping area. No camps have been recorded in the broader scoping area of study area. Grey-headed Flying-foxes are partial migrants: some individuals migrate whereas others are sedentary. Camp size fluctuates and many camps are empty for extensive periods (NSW Department of Environment Climate Change and Water 2009). Of the 14 camps surveyed in November and/or December 2016, 12 were inactive. The 2 active camps were outside of the broader scoping area.

Although there have been no recorded fatalities of flying-foxes from wind farms and baratrauma is not known to be an issue with mega-bats (Australian Bat Society Inc., 2017), further assessments on GHFF may be undertaken subject to the EPBC referral response.

Birds

Collision events with birds, whilst generally considered rare, are dependent on several factors as mentioned above (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). 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 are passerines and although there have been few studies on the displacement of 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).

Glossy Black-Cockatoos may occur in the southern-most portion of the study area (fly-over or in remnant patches with food trees) and south of the study area. Pine plantations are not considered suitable nesting or foraging habitat. Individuals spend as much as 88% of each day foraging (M.N. Clout, 1989). They are rarely found foraging in other than Allocasuarina and Casuarina species. Birds prefer to forage at sites with relatively higher Allocasuarina cover and avoid open sites where the predation risk may be greater (M Cameron; R.B. Cunningham, 2006). Based on current distribution of this sub-species, preferred habitat and behaviour, collision risk is considered to be low.

Powerful Owl *Ninox strenua* may possibly be found within the study area. 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.

Square-tailed Kite *Lophoictinia isura* and Black-necked Stork *Ephippiorhynchus asiaticus* are considered to have a moderate potential to occur (as flyover species). No previous records exist in the study area (or broader scoping area) and the area is not known to contain important population of these birds, as such; it is considered unlikely to have an impact on the populations within the local region. Square-tailed kite's hunt just above and through the canopy. Square-tailed kite's typical flight behaviour also puts them at low risk of collision.

Based on the project location, likelihood of occurrence, foraging and flight behaviour, State listed (NC Act) birds are considered at low risk of collision from the development.

Commonwealth listed birds

The Great Sandy Strait is approximately 5km from the nearest portion of the study area. The Great Sandy Strait is considered an internationally important site for seven (7) migratory species (Bamford et al. 2008). Previous collision risk assessment (Biosis, 2005) for these species has considered them unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005). The known behaviours of these species suggest that they would also actively avoid collisions or do not frequently fly in the zone swept by turbine rotors (Biosis, 2005). Buffer distances to mitigate impacts of direct disturbance is determined on a case-by-case basis. Previous studies have recommended buffer zones ranging from 165m – 255m (*Significant Impact Guidelines for 36 Migratory Shorebirds Species, Migratory Species, V3.21)*. Little is known about the effects of wind turbines on diurnal or nocturnal migratory species, particularly during take-off and landing adjacent to

wind farms, however during any impact assessment it is important to determine the seasonal duration of any collision effect and factor it appropriately into the annual survivorship rate.

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 GSS 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).

Large soaring birds, such as raptors are considered more at risk. Raptors such as wedge-tailed eagles and the EPBC Act (MT, LM) listed white-bellied sea eagle are known to occur in the project area.
Previous studies have assessed cumulative impacts of white-bellied sea-eagles across 56 wind farms in Australia (including 29 built and 27 proposed(Smales, 2005), with the cumulative impact considered low (Smales, 2005). Some individuals may be impacted through collision, although it is considered unlikely to have an impact on the populations within the local region.

Other high-flying soaring birds within the project area are white-throated needletails (*Hirundapus caudacutus* EPBC Act – LM, MM) and fork-tailed swift (*Apus pacificus* – EPBC Act – LM, MM). Both species were also assessed during previous collision risk modelling for EPBC migratory species. They are likely to be at risk of rotor strike as both species have been observed flying above, within and below rotor swept height at other wind farms, although previous risk assessments has considered the risk of impact on the Australian population of these species as low (Biosis, 2005).

6 MITIGATION MEASURES

A preliminary Environmental Management Plan has been developed for the project (**Appendix E**). The following objectives relate to mitigating the impacts to the nature conservation values of the study area during the construction and operation of the proposed project:

- No unnecessary removal of native vegetation.
- Limit the clearing of large mature trees wherever possible.
- Rehabilitate areas required only for construction to the same structure and function as pre-clearing.
- Ensure compliance with licenses and approvals at all times.

Impacts on nature conservation values of the Project Area will be minimised by appropriate design and avoidance where possible. Controls will be placed using these principles in hierarchical order:

- Eliminate the activity.
- Substitute with a lower risk activity or product.
- Engineer a solution to reduce the impact.
- Implement and maintain administration procedures to control the activity.
- Remediate to reverse the impact after an event.

Recommended mitigation and management measures are described in the following sections.

6.1 Prior to Construction

The following measures should be implemented prior to clearing and construction to mitigate impacts on the nature conservation values within and adjacent to the Forest Wind study area.

- Micro-siting will be undertaken during detailed design to further minimise impact on the mosaic of native vegetation within the pine plantations.
- Review and update the EMP (**Appendix E**), including developing an adaptive management monitoring program to document bird and bat mortalities and assess effectiveness and efficiencies of management measures.
- A fauna welfare plan will be prepared to address issues arising from any bird and bat strike at turbines and overhead powerlines.
- Ensure all necessary permits and approvals are in place prior to the removal of native vegetation.
- Develop and implement a Species Management Plan for EPBC Act, NC Act, Burnett Mary NRM Back on Track Report listed communities and species which may potentially be impacted by the proposed development prior to commencing clearing and construction work. The plan should include:
    - Management measures including those for the construction and operation of the Project and associated infrastructure
    - A monitoring and evaluation program with measurable targets for the communities and species
- Develop and implement an Erosion and Sediment Control Plan prior to commencing clearing and construction work to minimise erosion around the disturbance area and control sediment runoff.
- Develop and implement a detailed Weed Management Plan that addresses the construction, rehabilitation and operation phases of the project prior to commencing clearing and construction work. The plan should include hygiene protocols to minimise the likelihood of introduction and spread of environmental and declared weeds. These should include:
    - Implementation of sediment control mechanisms to reduce the potential for the spread of weed species into sensitive areas.
    - Vehicle wash down procedures and facilities to avoid the potential for weed spread.
- Develop a Fire Management Plan in close consultation with HQ Plantations, GRC and FCRC.

6.2 Construction

The following measures should be implemented during the construction phase to mitigate impacts on flora and fauna within and adjacent to the project area:

- Ensure compliance with all approval conditions and management plans at all times; including:
    - Pre-clearance surveys for micro-siting turbines, powerlines and tracks
    - Avoidance of locally significant habitat features such as termitaria and hollows
- Implement a control system to restrict clearing activities to the minimum possible to ensure safe working zones for construction and ensure that approvals are not exceeded.
- Clearly and accurately mark designated no go areas prior to any vegetation clearing.
- A suitably qualified person should inspect areas to be cleared for threatened species immediately prior to clearing.
- Spotter/catcher services (fauna handlers) must only be undertaken by those identified on a current Rehabilitation Permit from the DEHP.
- Cleared material should not be deposited in or adjacent to watercourses. Setbacks to waterways as defined by approval permits need to be adhered to.
- Undertake weed assessments prior to ground disturbance and continue to regularly monitor for changes in weeds throughout the project.

- Weed infestations within the construction areas are to be treated and/or removed where practical prior to clearing.
- Storage of fuels, chemicals, wastes and other potentially environmentally hazardous substances in bunded or otherwise contained areas away from watercourses.

6.3 Operation

- Continue to adhere to all management plans.
- Regularly monitor the prevalence of weed species in the disturbed and adjacent areas in accordance with the Weed Management Plan. Control and/or remove all weeds that have been introduced or exacerbated by the works.
- Implement the fauna welfare plan and protocols for injured wildlife.
- Implement EMPs and adaptive management plan monitoring. Monitoring will indicate compliance and any non-compliance with approval conditions and management plans. This will in turn inform where management systems are effective and where management systems need to be reviewed and altered to achieve their goals.
- Maintain a register of fauna incidents/interactions.
- Ensure that all site personnel are educated about and understand their environmental responsibilities prior to commencing work on site.

7 SUMMARY AND CONCLUSIONS

An ecological assessment has been undertaken over the Project scoping area and study area through desktop assessments and field surveys to determine the potential risks and impacts to flora, fauna and associated ecological processes. Mitigation and management measures have been developed to adequately manage identified risks and impacts.

The Project is located in Tuan, Toolara and Neerdie State Forests, which are highly modified landscapes of exotic pine plantations. The Project is ideally situated as the exotic pine plantations are considered of low ecological value. The siting of the Project within the pine plantations allows areas of ecological significance to be largely avoided, which has been validated through this ecological assessment and design layout.

The Project study area allows for micro-siting of infrastructure during the detailed design stage which will allow further avoidance of localised habitat features during construction.

Impacts to terrestrial and aquatic flora and fauna are not considered significant. Impacts to State listed bird and bat species are not considered significant. Risks and impacts to Matters of National Environmental Significance, while considered low, will be assessed through a separate approval process.

The following plans and assessments are recommended prior to construction, to further mitigate and manage potential risks and impacts associated with construction and operation of the wind farm.

- Undertake targeted flora surveys in high risk areas identified on DEHP's Protected Plants Flora Survey Trigger Map in accordance with the DEHP *Flora Survey Guidelines – Protected Plants* for clearing in mapped high-risk areas.
- Update the draft EMP, including developing an adaptive management monitoring program which sets out key impact management strategies for birds and bats.
- Prepare a fauna welfare plan to address issues arising from any bird and bat strike at turbines and overhead powerlines.

- Develop a Significant Species Management Plan for NC Act and Burnett Mary NRM Back on Track Report species listed as Endangered, Vulnerable or Near Threatened that have previously been recorded in Tuan, Toolara and Neerdie State Forests or species which may have potential to occur, prior to commencing clearing and construction work. The plan should include:
    - Management measures including those for the construction and operation of the Project and associated infrastructure
    - A monitoring and evaluation program with measurable targets for the communities and species
- Develop an Erosion and Sediment Control Plan and Stormwater Management Plan prior to commencing clearing and construction work to minimise erosion around the disturbance area and control sediment runoff.
- Undertake weed assessments prior to ground disturbance and continue to regularly monitor for changes in weeds throughout the project.
- Develop a detailed Weed Management Plan that addresses the construction, rehabilitation and operation phases of the project prior to commencing clearing and construction work. The plan should include hygiene protocols to minimise the likelihood of introduction and spread of environmental and declared weeds. These should include:
    - Implementation of sediment control mechanisms to reduce the potential for the spread of weed species into sensitive areas.
    - Vehicle wash down procedures and facilities to avoid the potential for weed spread.
- Develop a Fire Management Plan
- Undertake preclearance surveys within 14 days of clearing activities. Pre-clearance surveys must be undertaken by a suitably qualified person (minimum of 5 years' experience in conducting similar investigations).

- All clearing must be supervised by a fauna spotter/catcher service. Spotter / catcher must hold a current Rehabilitation Permit from the DEHP.

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APPENDIX A
FIGURES

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7,160,000

MARYBOROUGH

Tinana

TIARO

Bauple

Owanyill

Boonooroo

Tuan

Poona

Tawan

Tinnanbar

COOLOOLA COVE

TIN CAN BAY

FRASER COAST REGIONAL

GYMPIE REGIONAL

7,140,000

Mary River

Tinana Creek

Tinana Creek

460,000 480,000 500,000

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- LGA Boundary
- Forest Plantation Licence

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for Proposed Wind Farm CLEANSIGHT

Locality Map

Figure 1

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MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

IINDAH ROAD WEST
RIVER ROAD
SPRINGVALE ROAD
NERADA ROAD
BIDWILL ROAD
MUNGAR ROAD
TEDDINGTON ROAD
WEIR ROAD
MAAROOM ROAD
BOONOOROO ROAD
RAWSON STREET
POONA ROAD
BORONIA DRIVE
MARYBOROUGH COOLOOLA ROAD
TINNANBAR ROAD
BAUPLE DRIVE
BRUCE HIGHWAY
BECKMANNS ROAD
ARBORTEN ROAD
NEERDIE ROAD
GYMPIE ROAD
TIN CAN BAY ROAD
RAINBOW BEACH ROAD

Poona NP
Fraser Island
Great Sandy CP
Pipeclay NP
Tuan SF
Tiaro SF
Bauple SF
Neerdie SF 2
Neerdie SF 1
Toolara SF
Tinana Creek CP

Ramaz Nature Refuge
Mount Kanigan Nature Refuge
Mary River
Tinana Creek

Maryborough
Oaky Ck
Tuan
Boonooroo
Poona
Tawen
Tinnanbar
Bauple
Tin Can

Legend

- Potential Culvert
- Bridge Upgrade
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- Watercourse Identification Map

Road Network
- Highway
- Secondary Road
- Local Connector Road
- Street/Local

Conservation Areas
- MSES - Protected Area (estates)
- MSES - Protected Area (nature refuges)
- World Heritage Area
- Nature Refuge
- Forest Plantation Licence

Protected areas of Qld
- Conservation Park
- National Park
- National Park (scientific)
- Resource Reserve
- State Forest

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Conservation Areas

Figure 2

10 Aug 2017 Z:\GIS\SUN17_0063\GIS\Maps\Working (Optional)\report\v3\SUN17_0063_02_CONSERVATIONv3.mxd

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (Aug 2017)
DNPSR: Protected areas Qld (22 May 2017) DEHP: Nature Refuge (28 July 2017), MSES - Protected area estate (28 June 2017) DNPSR: Protected areas of Qld DOEE: World Heritage Areas (April 2017) © State of Queensland (DNRM, DNPSR, DEHP)

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MARYBOROUGH
Tinana
YENGARIE
GRAHAMS CREEK
MUNGAR
TINANA SOUTH
GLENORCHY
FERNEY
TEDDINGTON
BIDWILL
ANTIGUA
Gwanyilla
MAGNOLIA
Mary River
POONA NATIONAL PARK
MARYBOROUGH COOLOOLA ROAD
BOONOOROO PLAINS
MAAROOM
TUAN FOREST
TUAN STATE FOREST
Boonooroo
Tuan
Poona
Tinnanbar
TIARO
TIARO STATE FOREST
NETHERBY
TALEGALLA WEIR
Tinana Creek
MT BAUPLE 400 M
Bauple
GRASSY MTN 270 M
BAUPLE FOREST
BAUPLE STATE FOREST
MT NEERDIE 158 M
MT KANGAN 227 M
GLENWOOD
KANIGAN
NEERDIE
NEERDIE STATE FOREST
THREE BINE MTN 212 M
ATKINSONS MTN 270 M
MT EATON 280 M
ANDERLEIGH
ERINS KNOB 227 M
TOOLARA FOREST
KELLY 152 M
MT THOMAS 121 M
COOLOOLA COVE
MT ELLIOT 165 M
MT HERMAN 99 M
WIDE BAY TRAINING AREA
TIN CAN BAY

460,000 480,000 500,000

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- Ramsar Wetlands
- Directory of important wetlands

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Kilometers

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for Proposed Wind Farm CLEANSIGHT

Ramsar Wetlands and Directory of Important Wetlands

Figure 3

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10 Aug 2017

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017),DEHP: Ramsar Sites (2002), Directory of Important Wetlands (2005). Imagery QTOPO WebM © State of Queensland (DNRM, DEHP)

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MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tinana Creek

Mary River

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- MSES - High ecological value waters wetlands
- MSES - High ecological significance wetlands
- Potential trigger - MSES High Ecological Significance Wetlands

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Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

MSES - HEV wetlands
and HES wetlands

Figure 4

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Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017) DEHP: MSES - HEV & HES wetlands (30 June 2017), Imagery QTOPO WebM

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7,140,000

MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tinana

Owanyilla

Bauple

Tuan

Boonooroo

Poona

Tawan

Tinnanbar

Mary River

Tinana Creek

Tinana Creek

TUAN FOREST

BAUPLE FOREST

TOOLARA FOREST

TUAN STATE FOREST

TIARO STATE FOREST

BAUPLE STATE FOREST

NEERDIE STATE FOREST

YOUNG STATE FOREST 3

TALEGALLA WEIR

GRASSY MTN 270 M

MT NEERDIE 158 M

MT KANIGAN 327 M

MT EATON 289 M

ATKINSONS MTN 276 M

KELLY 152 M

MT THOMAS 121 M

MT HERMAN 99 M

MT ELLIOT 114 M

ERINS KNOB 237 M

Garden Island

Dream Island

Stewart Island

Ching Island

GREAT SANDY STRAIT

© State of Queensland (Department of Natural Resources and Mines) 2017

460,000 480,000 500,000

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- MSES - Regulated vegetation 100m from wetland
- Vegetation management wetlands map (v2.43)
- Potential trigger - MSES regulation vegetation 100m wetland buffer
- Potential trigger - VM wetlands

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Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

VM wetland and MSES regulated vegetation100m from wetland

Figure 5

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (August 2017) , VM wetland v2.43 (5 July 2017), DEHP: MSES - regulated vegetation 100m from wetland (30 June 2017) Image: Qtopo WebM © State of Queensland (DNRM, DEHP)

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MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tinana Creek

Mary River

© State of Queensland (Department of Natural Resources and Mines) 2017

Legend

- Potential Culvert
- Bridge Upgrade
- All routes (heavy vehicle routes)
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- Corridors
- MSES - High ecological value waters watercourse
- MSES - Regulated vegetation intersecting a watercourse
- Potential trigger - MSES - HEV watercourse
- Potential Trigger - MSES regulated vegetation intersecting a watercourse

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for Proposed Wind Farm CLEANSIGHT

MSES - Regulated vegetation (intersecting a watercourse) and High Ecological value Waters

Figure 6

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10 Aug 2017

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017)
DEHP: MSES - HEV Waterways & Regulated veg intersecting a watercourse (30 June 2017), Imagery QTOPO WebM © State of Queensland (DNRM, DEHP)

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MARYBOROUGH
Tinana
MUNGAR ROAD
TEDDINGTON ROAD
BIDWILL ROAD
MARYBOROUGH COOLOOLA ROAD
Poona National Park
Mary River
Owanyilla
Boonooroo
Tuan
TIARO
MAYNE STREET
Tuan State Forest
POONA ROAD
Poona
Tawan
Tinnanbar
TINNANBAR ROAD
Bauple
BRUCE HIGHWAY
Tinana Creek
Bauple State Forest
Toolara State Forest
TIN CAN BAY ROAD
GYMPIE ROAD
COOLOOLA COVE
Neerdie State Forest 2
NEERDIE ROAD
Curra State Forest
Great Sandy National Park

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Protected areas of Qld
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)

Road Network

- Highway
- Secondary Road
- Local Connector Road
- Street/Local

Regional Ecosystems (BD Status)

- Endangered (Dom)
- Endangered (Sub-dom)
- Of Concern (Dom)
- Of Concern (Sub-dom)
- Not of Concern
- Plantation
- Water

Potential trigger - Regional Ecosystem

- Endangered (Dom)
- Endangered (Sub-dom)
- Of Concern (Dom)
- Of Concern (Sub-dom)
- Not of Concern

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Regional Ecosystems V10
(Biodiversity Status)

Figure 7

10 Aug 2017 Z:\GIS\SUN17_0063\GIS\Maps\Working (Optional)\report\v3\SUN17_0063_07_RE_BDSTATUS_v3.mxd

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tinana

Mary River

Tinana Creek

Tinana Creek

Tuan

Poona

Tinnanbar

Garden Island

Dream Island

Stewart Island

GREAT SANDY STRAIT

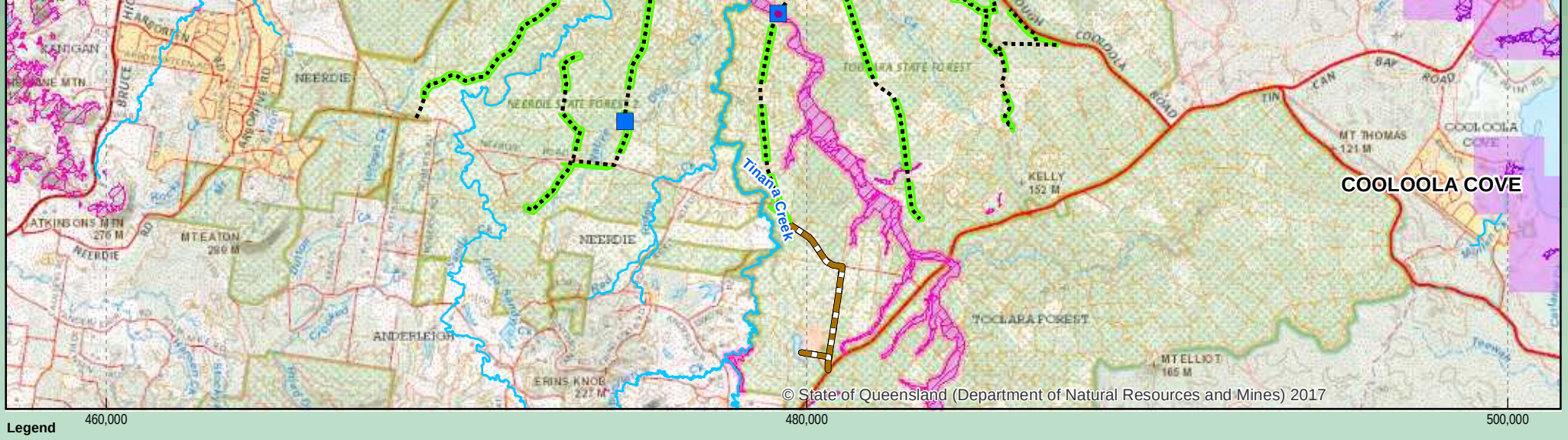
BOONOOROO PLAINS

TUAN FOREST

BAUPLE FOREST

TOOLARA FOREST

WIDE BAY TRAINING AREA



460,000 480,000 500,000

Legend

- Watercourse Identification Map
- Potential Culvert
- Bridge Upgrade
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)

TECs (BPA v4.1 SEQ)

- Lowland rainforest subtropical australia (14)
- Subtropical temperate coastal saltmarsh (16)

Subtropical temperate coastal saltmarsh (DOE)

- Community likely to occur

Lowland rainforest subtropical australia (DOE)

- Community likely to occur
- Community may occur

Potential trigger - TEC

- Community likely to occur

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Threatened Ecological Communities

Figure 8

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (Aug 2017). Image: QTopo WebM
DEHP: TEC extracted from BPA (SEQ v4.1, Sept 2016) Criteria NTEC. DOE: TEC - ECnes Public (Nov 2016) © State of Queensland (DNRM, DEHP)

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10 Aug 2017

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tinana

Yengarie

Graham's Creek

Mungar

Tinana South

Glenorchy

Ferney

Teddington

Bidwill

Antigua

Owanyilla

Magnolia

Mary River

Tuan Forest

Tuan State Forest

Boonooroo

Tuan

Garden Island

Round Bush Is.

Dream Island

Stewart Island

Great Sandy Strait

Poona

Tawan

Tinnanbar

Ching Island

Maaroom

Boonooroo Plains

Maryborough Cooloola Road

Poona Road

Tinnanbar Road

Tinana Creek

Netherby

Talegalla Weir

Mt Bauple

Bauple

Grassy Mtn 270 m

Bauple Forest

Mt Keerdie 158 m

Mt Kanigan 227 m

Glenwood

Kanigan

Three Bine Mtn 212 m

Neerdie

Neerdie State Forest

Atkinsons Mtn 276 m

Mt Eaton 280 m

Anderleigh

Erins Knob 227 m

Toolara Forest

Kelly 152 m

Mt Thomas 125 m

Mt Elliot 165 m

Mt Herman 98 m

Wide Bay Training Area

Hard State Forest

Tahiti State Forest

Toolara State Forest

Shark Inlet

Elbow Point

Poona Point

Boonooroo Point

Tooth Is.

Boonjee Point

Slam Is.

Beelwa Lagoon

Yankee Jack L.

Tin Can Bay

Cooloola Cove

Bay Road

Tin Can Bay Road

Tuan State Forest Road

Maryborough Cooloola Road

Bidwill Road

Teddington Road

Mungar Road

River Road

Bruce Highway

Tinana Creek

Mary River

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- MSES - Regulated vegetation (essential_habitat)
- Potential trigger - MSES Essential Habitat

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

MSES - Regulated Vegetation
Essential Habitat

Figure 9

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017), Imagery QTOPO WebM
DEHP: MSES - Regulated vegetation Essential habitat (30 June 2017) © State of Queensland (DNRM, DEHP)

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460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

COOLOOLA COVE

Tinana

Owanyilla

Bauple

Boonooroo

Tuan

Poona

Timanbar

Mary River

Tinana Creek

YENGARIE

GRAHAMS CREEK

MUNGAR

TINANA SOUTH

GLENORCHY

FERNEY

TEDDINGTON

BIDWILL

ANTIGUA

MAGNOLIA

POONA NATIONAL PARK

BOONOOROO PLAINS

MAAROOM

TUAN FOREST

TUAN STATE FOREST

SANDY STRAIT

BEELIWA LAGOON

TIARO STATE FOREST

NETHERBY

TALEGALLA WEIR

MT BAUPLE 409 M

GRASSY MTN 270 M

BAUPLE FOREST

MT NEERDIE 156 M

MT KANIGAN 327 M

GLENWOOD

KANIGAN

NEERDIE

HEEBINE MTN 12 M

ATKINSONS MTN 276 M

MT EATON 289 M

ANDERLEIGH

ERINS KNOB 227 M

TOOLARA FOREST

WIDE BAY TRAINING AREA

MT HERMAN 99 M

MT THOMAS 121 M

KELLY 162 M

MT ELLIOT 165 M

TIN CAN BAY

COOLOOLA COVE

460,000 480,000 500,000

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- MSES - fish habitat area
- Dugong Protection Areas

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Dugong Protection Areas
and Fish Habitat Areas

Figure 10

10 Aug 2017 Z:\GIS\SUN17_0063\GIS\Maps\Working (Optional)\report\v3\SUN17_0063_10_DUGONG_FHA_v3.mxd

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017), Imagery QTOPO WebM DAF: Dugong Protection Areas (March 2013)
DEHP: MSES - Fish Habitat Area (28 June 2017) © State of Queensland (DNRM, DEHP)

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Mary River

Tinana Creek

Tinana Creek

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- MSES - Wildlife habitat
- Potential trigger - MSES - wildlife

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for Proposed Wind Farm CLEANSIGHT

MSES - Wildlife Habitat, Threatened and Special Least Concern animal

Figure 11

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10 Aug 2017

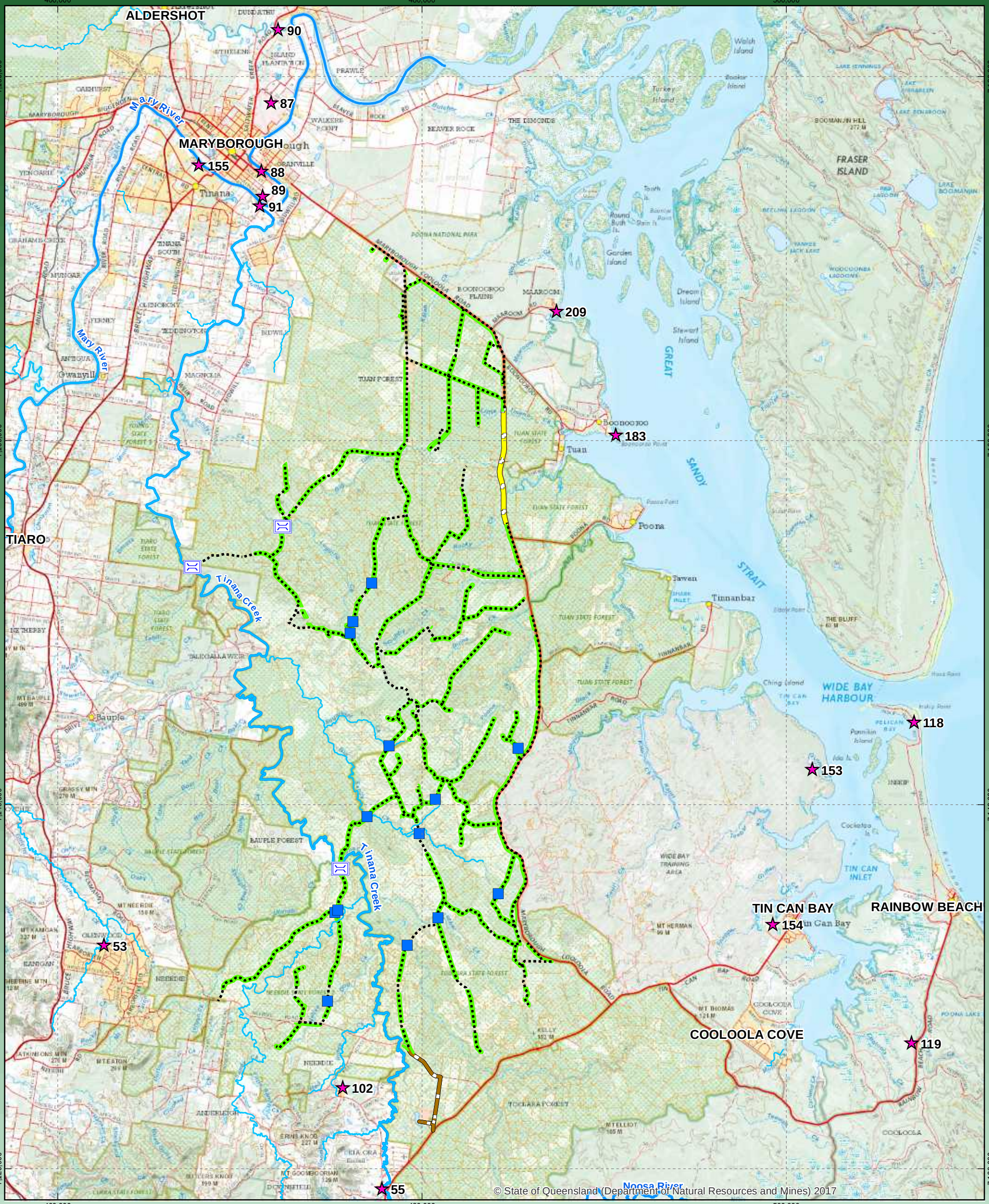
Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017), Imagery QTOPO WebM
DEHP: MSES - Wildlife (30 June 2017) © State of Queensland (DNRM, DEHP)

460,000 480,000 500,000

7,180,000 7,160,000 7,140,000 7,120,000

ALDERSHOT
MARYBOROUGH
Tinana
TIARO
Bauple
Owanyilla
Poona
Tuan
Tinnanbar
Boonooroo
Mary River
Tinana Creek
FRASER ISLAND
GREAT SANDY STRAIT
WIDE BAY HARBOUR
TIN CAN BAY
RAINBOW BEACH
COOLOOLA COVE
Noosa River

90 87 155 88 89 91 209 183 118 153 154 119 53 102 55



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Legend

- Flying Fox Camp locations (DEHP)
- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)

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N W E S

0 1.5 3 4.5 6 7.5
Kilometers

1:200,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Flying-fox Camps

Figure 12

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10 Aug 2017

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (Aug 2017) Image - QTopo WebM, DEHP:Flying fox Locations/camps (Dec 2016)
Premise: Field surveys 2017 © State of Queensland (DNRM, DEHP)

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

TIN CAN BAY

COOLOOLA COVE

Tiana

Owanyilla

Bauple

Toogoom

Boonooroo

Tuan

Poona

Tin Can Bay

Mary River

Tiana Creek

Tiana Creek

MARYBOROUGH COOLOOLA ROAD

TUAN FOREST

TUAN STATE FOREST

POONA NATIONAL PARK

BOONOOROO PLAINS

MAAROOM

GREAT SANDY STRAIT

BEELIWA LAGOON

YANKEE JACK LAKE

Garden Island

Dream Island

Stewart Island

Round Bush Is.

Tooth Is.

Ching Island

TIN CAN BAY

WIDE BAY TRAINING AREA

BAUPLE FOREST

TOOLARA FOREST

YENGARIE

MUNGAR

FERNEY

ANTIGUA

MAGNOLIA

TELEGRAPH

BIDWILL

GRANVILLE

TABLE TALLAWEIR

MT BAUPLE 429 M

GRASSY MTN 270 M

MT NEERDIE 156 M

MT KANIGAN 327 M

KANIGAN

NEERDIE

ATKINSONS MTN 276 M

MT EATON 281 M

ANDERLEIGH

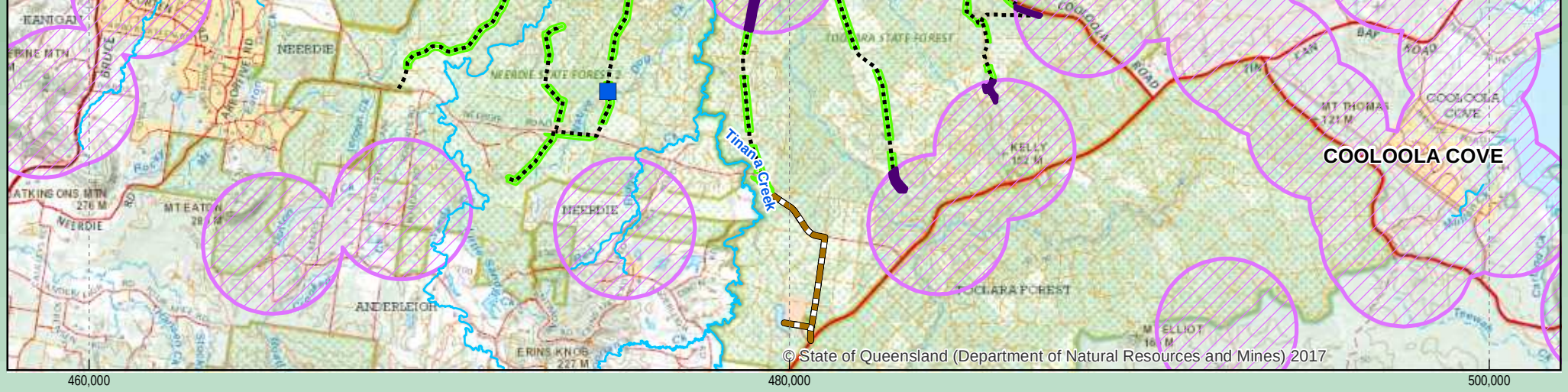
ERINS KNOB 227 M

MT HERMAN 99 M

MT THOMAS 121 M

KELLY 152 M

M ELLIOT 161 M



460,000 480,000 500,000

Legend

- Potential Culvert
- Bridge Upgrade
- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- Flora Trigger Area
- Potential Trigger - Flora Trigger Areas

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Flora Trigger Areas

Figure 13

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Water Identification Map - watercourse (Aug 2017), Imagery QTOPO WebM
DEHP: Flora Trigger Area v5 (May 2017) © State of Queensland (DNRM, DEHP)

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10 Aug 2017

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH

TIARO

Bauple

Boonooroo

Tuan

Poona

Tawan

Tinnanbar

TIN CAN BAY

COOLOOLA COVE

TUAN FOREST

BAUPLE FOREST

NEERDIE

TOOGARA FOREST

MARYBOROUGH COOLOOLA ROAD

POONA NATIONAL PARK

BOONOOROO PLAINS

MAAROOM

GREAT SANDY STRAIT

Legend

- Potential Culvert
- Bridge Upgrade
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)

Waterway Barrier Works Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Waterway Barrier Works Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Qld Waterways for waterway
Barrier Works

Figure 14

10 Aug 2017 Z:\GIS\SUN17_0063\GIS\Maps\Working (Optional)\report\v3\SUN17_0063_14_WATERBARRIERWORKS_v3.mxd

460,000 480,000 500,000

7,160,000

7,140,000

MARYBOROUGH
Tinana
GRANVILLE
YENGARIE
GRAHAMS CREEK
MUNGAR
TINANA SOUTH
FERNEY
GLENORCH
TEDDINGTON
ANTIGUA
Owanyilla
TIARO
TIARO STATE FOREST
NETHERBY
TALEGALLA WEIR
MT BAUPLE 409 M
Bauple
GRASSY MTN 270 M
BAUPLE FOREST
BAUPLE STATE FOREST
MT NEERDIE 158 M
MT KANIGAN 327 M
KANIGAN
NEERDIE
THEEBINE MTN 312 M
ATKINSONS MTN 276 M
MT EATON 289 M
ANDERLEIGH
ERINS KNOB 227 M
POONA NATIONAL PARK
BOONOOROO PLAINS
MAAROOM
TUAN FOREST
TUAN STATE FOREST
Boonooroo
Tuan
Poona
Tawan
Tinnanbar
Tooth Is.
Round Bush Is.
Slate Is.
Garden Island
Dream Island
Stewart Island
GREAT SANDY STRAIT
Poona Point
Elbow Point
Ching Island
TIN CAN BAY
WIDE BAY TRAINING AREA
MT HERMAN 99 M
TOOLARA FOREST
MT THOMAS 121 M
COOLOOLA COVE
KELLY 152 M
MT ELLIOT 165 M

Mary River
Minni Minni Creek
Tinana Creek
UT Tinana Creek
Jumpo Creek
Gutchy Creek
Mt Eaton Creek
Sugarloaf Creek
Big Sandy Creek
UT Big Sandy Creek
Sandy Creek
Red Ridge Creek
UT Red Ridge Creek

MARYBOROUGH COOLOOLA ROAD
MAAROOM RD
BOONOOROO RD
TINNANBAR ROAD
COOLOOLA ROAD
TIN CAN BAY ROAD
BRUCE HIGHWAY
BIDWILL RD
TEDDINGTON RD
MUNGAR ROAD
RIVER ROAD
WEIR ROAD

Legend

- Potential Culvert
- Bridge Upgrade
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)
- Watercourse identification map

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N W E S

0 1 2 3 4 5
Kilometers

1:165,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Watercourse
Identification Map

Figure 15

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (Aug 2017) V© State of Queensland (DNRM)

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10 Aug 2017

460,000 480,000 500,000

7,160,000 7,140,000

MARYBOROUGH
155
88
89
91
Tinana
GRANVILLE
YENGARIE
GRAHAMS CREEK
MUNGAR
TINANA SOUTH
GLENORCHY
FERNEY
TEDDINGTON
BIDWILL
ANTIQUA
Owanyilla
MAGNOLIA
Mary River
POONA NATIONAL PARK
MARYBOROUGH COOLOOLA ROAD
BOONOOROO PLAINS
MAAROOM
209
TUAN FOREST
PC2-7
PC2-6
Boonooroo
183
Tuan
TUAN STATE FOREST
Poona
Tawan
Tinnanbar
PC2-5
PC1-1
PC2-4
153
PC1-2
PC2-3
PC2-2
PC2-1
PC1-3
TIARO
NETHERBY
TALEGALLAWA
Tinana Creek
MT BAUPLE
Bauple
GRASSY MTN
BAUPLE FOREST
MT NEERDIE
MT KANIGAN
GLENWOOD
53
NEERDIE
102
ANDERLEIGH
ERINS KNOB
KIA ORA
TOOLARA FOREST
MT ELLIOT
MT HERMAN
WIDE BAY TRAINING AREA
TIN CAN BAY
154
Tin Can
COOLOOLA COVE
MT THOMAS
KELLY
STRAIT
SANDY
GREAT
Stewart Island
Dream Island
Garden Island
Round Bush Is.
BEELIWA LAGOON
YANKEE JACK LAKE
Ching Island

Legend

Flying fox camp locations (EHP ID)
- Active
- No access
- Not active

- Bird Survey Locations
- Potential Culvert
- Bridge Upgrade

- Watercourse Identification Map
- All routes (heavy vehicle routes)
- Corridors
- Additional vehicle route or potential powerline (to Laminex Factory)
- Additional vehicle route or potential powerline (Maryborough Cooloola Rd)

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N W E S

0 1 2 3 4 5
Kilometers

1:170,000 at A3

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

Preliminary Ecological Assessment for
Proposed Wind Farm
CLEANSIGHT

Survey Locations

Figure 16

Data source: DNRM: Local Government Boundaries QLD (May 2017), Rail Network QLD (Feb 2014), Baseline Roads and Tracks QLD (Mar 2017), Place name gazetteer (Mar 2015), Watercourse Identification Map - watercourse (Aug 2017) Image - QTopo WebM, DEHP:Flying fox Locations/camps (Dec 2016)
Premise: Field surveys 2017 © State of Queensland (DNRM, DEHP)

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10 Aug 2017

APPENDIX B
LIKELIHOOD OF OCCURRENCE

Table 6 Likelihood of Occurrence – Threatened Fauna including Migratory Birds

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Reptiles						
Acanthophis antarcticus Common Death Adder	-	NT	-	Common Death Adders inhabit a wide range of habitats ranging from grasslands, woodlands, rocky ranges and outcrops (Wilson & Swan, 2013).	**Moderate potential to occur across general study area.** No previous records	**Low risk of impact** No previous records although detectability of the species is difficult due to its cryptic nature.
Delma torquata *Collared Delma*	V	V		Typically associated with western facing ridgelines supporting dry open eucalypt and acacia woodlands with an open midstorey and groundcover of native grasses, thick leaf litter and loose rocks.	**Low potential to occur** No previous records	**Low risk of impact** No previous records and lack of suitable habitat.
Elseya albagula Southern (white-throated) snapping turtle	CE	E		Found only in Queensland in the Fitzroy, Mary and Burnett Rivers and associated smaller drainages in south eastern Queensland. White throated snapping turtles do occur in non-flowing waters, but typically at much reduced densities (conservation advice, white-throated snapping turtle, 2016)	**Previous records within Toolara and Tuan State Forests (Wildlife Online).** Would not occur in pine plantations. Only potential habitat within Study area is Tinana Creek.	**Low risk of impact** Only potential habitat along Tinana Creek. All works undertaken in accordance with approved Species Management Program.
Elseya albagula Mary River Turtle	E	E		Restricted to permanent flowing streams and large pool habitats of the Mary River catchment.	**Moderate potential to occur** No previous records although potential habitat in Tinana Creek.	**Low risk of impact** Only potential habitat along Tinana Creek. All works undertaken in accordance with approved Species Management Program.
Ramphotyphlops silvia Cooloola Blind Snake	-	NT	-	Inhabits coastal rainforest, woodlands and heaths growing on white sand between south Fraser Island and Noosa National Park. Shelters in sand	**Low potential to occur** No previous records	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				and decomposed wood under logs and leaf litter. (Wilson & Swan, 2008)		
Saproscincus rosei	-	NT	-	Occurs in coastal ranges in south-east Queensland and northern NSW. Shelters, basks and forages among fallen logs, leaf litter and rocks (Wilson & Swan, 2013).	**Low potential to occur** No previous records	**Low risk of impact**
Amphibians						
Adelotus brevis Tusked Frog	-	V	NT	Breeds in ponds and slow-moving sections of streams in rainforests, wet sclerophyll forests and, less commonly, dry open forest. Usually is found under logs, stones or leaf litter near puddles, creeks and ponds The call is a slow "cluck" repeated several times a minute. (Curtis & Dennis, 2012)	**Moderate potential to occur** No previous records although is found in a wide variety of habitats.	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Crinia tinnula Wallum Froglet	-	V	VU	Restricted to coastal wallum and associated with wet heath, *Melaleuca* swamps, wallum lakes and sedge swamps. Also known to occur in disturbed habitat including recently burnt heath and 4WD-affected sites (Curtis & Dennis, 2012) The call is a short high-pitched ring "tching...tching" like the tinkling of a bell.	**Previous records within Toolara State Forest.** High potential to occur in low lying areas where suitable habitat exists (eg. remnant vegetation in the northern portion of the study area). Low potential to occur in pine plantations away from drainage lines.	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Litoria cooloolensis Cooloola sedgefrog		NT	EN	The terrestrial freshwater species is found in sandy coastal and island freshwater lakes and wallum creeks, where it has a preference for dense reed beds. It is a spring and summer breeder, with males calling from reeds or trees around freshwater lakes. Eggs are deposited on submerged vegetation;	**Previous records within Toolara State Forest** High potential to occur in low lying areas where suitable habitat exists (eg. remnant	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				larvae are free-swimming. (Hines, Meyer, Hero, Newell, & Clarke, 2004)	vegetation in the northern portion of the study area). Low potential to occur in pine plantations away from drainage lines. Creeks and low lying areas running through pine plantations are considered low value habitat.	accordance with approved Species Management Program.
Litoria freycineti Wallum Rocketfrog	-	V	V	In south-east Queensland it is restricted to coastal sandy wallum habitat. Found mainly around sedge swamps, drainage lines and perched lakes. Has also been found some distance from water in eucalypt forest near areas of wet heath (Curtis & Dennis, 2012)	**Previous records within Toolara State Forest.** High potential to occur in low lying areas where suitable habitat exists. Low potential to occur in pine plantations away from drainage lines. Creeks and low lying areas running through pine plantations are considered low value habitat.	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Litoria olongburensis Wallum Sedge Frog	V	V	VU	Found in ephemeral, semi-permanent and permanent wetlands with emergent reeds, ferns and/or sedges, in undisturbed coastal wallum of South-East Queensland to northern NSW. Often not sympatric with *Litoria fallax* and generally found in fish free environments. Rarely occurs if gambusia is present. The call is a soft 'buzzing'. (Curtis & Dennis, 2012)	**Previous records within Toolara State Forest.** Although previously recorded no suitable habitat was observed during the site reconnaissance. Creeks and low lying areas running through pine plantations are considered low value habitat.	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Mammals						
Chalinolobus picatus Little pied bat	-	NT	NT	Occurs most frequently in dry, open woodland communities throughout its range but has also	**Moderate potential to occur.**	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				been recorded in dry sclerophyll forests and *Araucarian notophyll* vine forests in south-east Queensland. Dry sclerophyll forests inhabited in south-east and central coastal Queensland include types dominated by *Corymbia citriodora*, *Eucalyptus moluccana*, *E. tereticornis* and ironbark species. In the central and western Darling Downs area of Queensland it has been predominantly recorded from *Callitris/Allocasuarina* dominated forests with scattered eucalypt emergents such as *E. dealbata* and *E. fibrosa*. In the more arid parts of its range in Queensland, New South Wales and South Australia it has been recorded from mulga (*Acacia aneura*) woodlands, from patches of *Eucalyptus largiflorens* woodlands (New South Wales) and riverine *E. camaldulensis* dominated communities. (Duncan, Baker, & Montgomery, 1999) Little pied bats have been recorded roosting in tree hollows, caves, abandoned mines, and buildings (Department of Environment and Heritage Protection, 2013). Roosts in tree hollows are in dead limbs and hollowed stumps, and occur in mature mulga, bloodwoods and other large eucalypts (Hourigan, 2012) This species is reported as scarce in highly fragmented landscapes but persists in corridors and well-connected small remnants of native vegetation. (Hourigan, 2012)	No previous records however suitable habitat exists in the adjacent National Park.	If present (although no previous records) this species is expected to forage within vegetated areas along creek lines / flyways which are at a lower topographic position than the wind turbines. The proposed height of the towers and difference in topographic position to the flyways creates a significant separation distance. This is considered to reduce the likelihood of collision and baratrauma and therefore the risk is considered low.
Dasyurus hallucatus Northern Quoll	E	-	EN	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests,	**Low potential to occur** No previous records.	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				sandy lowlands and beaches, shrubland, grasslands and desert. Northern Quolls are also known to occupy non rocky lowland habitats such as beach scrub communities in central Queensland. Northern Quoll habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected but can also include tor fields or caves in low lying areas such as in Western Australia. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds (Department of the Environment, 2014a).	No suitable habitat in the study area.	Due to lack of previous records and suitable habitat.
Dasyurus maculatus maculatus Spotted-tail Quoll	E	V	NT* (**Dasyurus maculatus*)	Preference for mature wet forest habitat, especially in areas with rainfall 600 mm/year. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This subspecies has been recorded from a wide range of habitats. Prey-rich (small mammals (including possums), birds, reptiles, frogs) habitats are preferable (Department of the Environment, 2015f).	**Low potential to occur** No previous records. No suitable habitat in the study area.	**Low risk of impact** Due to lack of previous records and suitable habitat.
Ornithorhynchus anatinus Platypus	-	SL	LC	Streams and suitable freshwater bodies, including some shallow water storage lakes and ponds in areas ranging from cold, high altitudes to tropical rainforest lowlands and plateaus (Van Dyck, Gynther, & Baker, 2013).	**Moderate potential to occur (Tinana Creek only)** No previous records.	**Low risk of impact** Only potential habitat along Tinana Creek. All works undertaken in accordance with

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Platypus feed in both slow-moving and rapid (riffle) parts of streams and are more abundant in areas with pool-riffle sequences. The species shows preference to coarser bottom substrates, particularly cobbles and gravel. Logs, twigs, and roots, as well as cobbled or gravel water substrate result in increased microinvertebrate fauna, a main food source. (Divljan, 2014) Ideal habitat for the species includes rivers or streams with earth banks and native vegetation shading the stream and providing cover near the bank. Burrows are in the banks of rivers, creeks or ponds and under the roots of vegetation near streams. Some individuals may use rocky crevices and stream debris as shelters. (Divljan, 2014)		approved Species Management Program.
Petauroides volans volans Southern greater glider	V	V		The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers (Conservation advice, 2017)	**Previous records within Tuan State Forest.** Low potential to occur in Pine Plantations. May occur in larger remnant patches in broader scoping area. The greater glider is considered to be particularly sensitive to forest clearance and to intensive logging (approved Conservation advice, 2017	**Low risk of impact** Infrastructure sited predominantly in pine plantations, largely avoiding areas of native vegetation.
Phascolarctos cinereus Koala	V	C V (SEQ only)	LC	Scattered populations throughout Qld, including moist forests in coastal areas, subhumid woodlands in southern and central regions, and along watercourses in semiarid eucalypt forested	**Previous records within Toolara State Forest.** Low potential to occur in Pine Plantations. May occur in remnant patches along	**Low risk of impact** Infrastructure sited predominantly in pine

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				landscapes in the west. May also be found along non-riverine communities in semi-arid areas. Preferred habitat includes a range of temperate, sub-tropical and tropical forest, woodlands and semiarid vegetation types dominated by eucalyptus species. Also known to be limited to altitudes <800 m ASL and may be affected by temperature and leaf moisture in the western and northern parts of its range (Department of the Environment, 2014d).	waterway corridors where suitable habitat occurs (provided suitable connectivity). May utilise creek lines for movement corridors within remnant vegetation in the scoping area.	plantations, largely avoiding areas of native vegetation.
Potorous tridactylus tridactylus Long-nosed Potoroo	V	V	LC* (**Potorous tridactylus*)	There is no consistent pattern to the habitat of the Long-nosed Potoroo (SE Mainland); it can be found in wet eucalypt forests to coastal heaths and scrubs. The main factors would appear to be access to some form of dense vegetation for shelter and the presence of an abundant supply of fungi for food (Curtis & Dennis, 2012)	**Low potential to occur** No suitable habitat exists in pine plantations or study area. Potential habitat in remnant heath vegetation in northern portion of the scoping area.	**Low risk of impact** Infrastructure sited predominantly in pine plantations, largely avoiding areas of native vegetation.
Pteropus poliocephalus Grey-headed Flying-fox	V	-	VU	A canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands (Department of the Environment, 2014e). Roost sites are typically located near water, such as lakes, rivers or the coast.	**Known to fly over the study area.** Known roosts adjacent to broader scoping area (regional presence).	**Low risk of impact** No known camps in study area although camps known within broader regional area. Camps in the region fluctuate depending on food resources. Pine plantations do not support preferred food resource, other than isolated patches of remnant native vegetation. Further risk assessments undertaken during concurrent EPBC approval process.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Tachyglossus aculeatus short-beaked echidna	-	SL	LC	The Short-beaked Echidna lives in forests and woodlands, heath, grasslands and arid environments. It has no particular habitat requirements except a supply of ants and termites. (Van Dyck et al., 2013)	**Previous records within Tuan State Forest.** High potential to occur	**Low risk of impact** Minimal disturbance footprint for infrastructure. All clearing and construction undertaken in accordance with Species Management Program
Xeromys myoides Water mouse	V	V	VU	Found in habitats including mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands (Department of the Environment, 2015t).	**Previous records within Tuan State Forest** No suitable habitat within the pine plantations or study area.	**Low risk of impact** No suitable habitat within the pine plantations or study area.
Fish						
Maccullochella mariensis Mary River cod	E	-	-	The Mary River Cod occurs in three natural subpopulations (Lake Macdonald, Tinana Creek and Coondoo Creek upstream of Tinana Barrage, and upper Obi Obi Creek) in different tributary systems of the Mary River which are isolated from one another by impoundments and the main river channel. (Department of the Environment, 2015i) The Mary River Cod occurs mainly in pools within relatively undisturbed tributaries, preferring relatively large and deep (0.8 to 3.2 m) shaded pools with abundant, slowly flowing water. Submerged logs and branches (snags) are used as cover from which to ambush prey, as resting sites, and as nesting sites. (Department of the Environment, 2015i)	**Previous records within Toolara and Tuan State Forests.** Potential habitat exists in Tinana Creek	**Low risk of impact** Only potential habitat within Tinana Creek. All works undertaken in accordance with approved Species Management Program.
Nannoperca oxleyana Oxleyan Pygmy Perch	E	V	EN	Occurs in coastal *Banksia*-dominated heath or wallum habitats. Usually inhabit waters with a high	**Previous records within Toolara State Forest.**	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				proportion of aquatic plant cover, i.e. between 60-80% (Department of the Environment, 2015k).	Potential to occur in smaller creeks and pools within the study area.	Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Neoceratodus forsteri Australian lungfish	V	-	-	The Australian Lungfish's natural distribution is the Mary, Burnett and Brisbane River systems and (possibly) the Pine River system but translocated populations persist in the Coomera, Condamine, Albert and Logan Rivers. (Department of the Environment, 2015m) The species is restricted to areas of permanent water and cannot live in saline waters or migrate through sea water. Still or slow-flowing, shallow, vegetated pools with clear or turbid water are required to spawn and feed. Emergent or submerged vegetation are essential for successful deposition of eggs and for providing refuges for juveniles. (Department of the Environment, 2015m)	**Moderate potential to occur** No previous records although suitable habitat exists within Tinana Creek.	**Low risk of impact** Only potential habitat within Tinana Creek. All works undertaken in accordance with approved Species Management Program.
Pseudomugil mellis Honey Blue Eye	V	V	EN	Inhabits slightly acidic (pH 4.4–6.8), clear and tannin-stained lakes, streams and wetlands with sandy or muddy bottoms in coastal heath (wallum) ecosystem. The species usually occurs where there is little or no flow, and the fish can find shelter in dense, aquatic vegetation (Department of the Environment, 2015r).	**Moderate potential to occur** No previous records however potential to occur in smaller creeks and pools within the study area.	**Low risk of impact** Turbine infrastructure sited away from low-lying areas and waterbodies. Any culvert upgrades undertaken in accordance with approved Species Management Program.
Birds						
Botaurus poiciloptilus Australian Bittern	E	-	EN	Occurs predominantly in densely vegetated freshwater wetlands, reed beds, swamps, streams.	**Low potential to occur.** No previous records	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Queensland population considered to be mostly confined to a few coastal swamps. (Simpson & Day, 2004)		Low potential to occur and turbine infrastructure sited away from low-lying areas and waterbodies.
Calidris ferruginea Curlew Sandpiper	CE	SL	LC	Mainly occur in both fresh and brackish waters on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms but are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand (Higgins & Davies, 1996). Curlew Sandpipers forage on mudflats and nearby shallow water and generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh (Higgins & Davies, 1996).	**Low potential to occur.** No previous records and no suitable habitat within the study area. Low potential to occur within study area due to specific habitat requirements.	**Low risk of impact** Low risk due to specific habitat requirements.
Calyptorhynchus lathami lathami (eastern subspecies) Glossy Black Cockatoo	-	V	LC* *(* *Calyptorhynchus lathami* *)*	The Glossy Black-Cockatoo is highly dependent on the distribution of *Allocasuarina* species and is found in woodland dominated by *Allocasuarina* and in open forests where it forms a substantial middle layer. Often confined to remnant *Allocasuarina* patches surrounded by cleared farmlands. Requires tree hollows for breeding (Birdlife, 2014b). South-east Queensland has the three of the most significant populations in Australia: Moreton Bay,	**Moderate potential to occur** Previous records within Tuan State Forest. Northern range is southern extent of study area. Suitable habitat exists in the adjacent National Park to the south.	**Low risk of impact** Based on current distribution of this sub-species, preferred habitat and behaviour, collision risk is considered to be low.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Gold Coast Hinterland and Noosa. (Urban Biodiversity Advisory Consortium, 2006)		
Ephippiorhynchus asiaticus Black-necked Stork	-	NT	NT	Restricted mainly to coastal and near-coastal areas of northern and eastern Australia, tending fewer down to south-east Queensland. Habitats are diverse but often wetlands and their vicinity, such as floodplains of rivers with large shallow swamps and pools, and deeper permanent bodies of water (Birdlife, 2014a; Morcombe, 2003). Foraging is mainly in shallow, still water, preferring open wetlands, and taking a variety of prey, including eels and other fish, frogs, turtles, snakes, and invertebrates (such as crabs and insects).	**Moderate potential to occur** No previous records although suitable habitat exists in the Great Sandy Strait.	**Low risk of impact** No previous records in study area or broader scoping area. The area is not known to contain important populations of these birds, as such; it is considered unlikely to have an impact on the populations within the local region.
Erythrotriorchis radiatus Red goshawk	V	E	NT	Occurs in coastal and sub-coastal areas in riverine, wooded and forested lands of tropical and warm-temperate Australia. Known to prefer forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins. The Red Goshawk nests in large trees, frequently the tallest and most massive in a tall stand, and nest trees are invariably within one km of permanent water (Department of the Environment, 2014b).	**Low potential to occur** No previous records and no suitable habitat in the pine plantations. Previous records exist in the adjacent Great Sandy National Park.	**Low risk of impact** No previous records and no suitable habitat in the pine plantations.
Fregata grallaria grallaria White-bellied Storm Petrel	V	-	LC	It has also been recorded over near-shore waters off the coasts of Queensland.	**Low potential to occur** No suitable habitat exists as this is a marine species.	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
						No previous records and no suitable habitat in the pine plantations.
Lewinia pectoralis Lewin's Rail (Syn. *Rallus pectoralis)*	-	NT	LC	Inhabits wetland areas with dense vegetation, including wetlands, farm dams, swamps, saline lakes and river flats where they usually forage around the water's edge in shallow water and close to cover for a variety of aquatic plants and invertebrates (SWIFFT, 2010).	**Low potential to occur** No previous records and no suitable habitat in study area.	**Low risk of impact** No previous records and no suitable habitat in the pine plantations. Turbine infrastructure sited away from low-lying areas and waterbodies.
Lophoictinia isura Square-Tailed Kite	-	NT	LC	Mainly inhabits open eucalypt forests and woodlands with mature trees, often where there is a broken canopy. It also ranges into nearby open habitats and occurs along the edges of dense forest, along road verges with remnant or planted trees, in clearings within forest or in areas of regrowth. Other habitats which occasionally support Square-tailed Kites include mallee, heathland (mallee or coastal) and other low shrublands including saltbush plains, grasslands or open or cultivated farmland near remnant woodland. (Birdlife, 2014c; Morcombe, 2003; SWIFFT, 2007). Known to be a specialised canopy predator where they soar above or through the canopy.	**Moderate potential to occur** No previous records in Tuan or Toolara State Forests. Previous records and suitable habitat within the adjacent Great Sandy National Park.	**Low risk of impact** No previous records. Square-tailed kite's hunt just above and through the canopy. Square-tailed kite's typical flight behaviour puts them at low risk of collision.
Grantiella picta Painted Honeyeater	-	V	VU	Sparsely distributed from southern Victoria and south-eastern South Australia to far northern Queensland and eastern Northern Territory where	**Low potential to occur**	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				it inhabits forests, woodlands and dry shrublands, often with abundant mistletoe(Birdlife; Morcombe, 2003)	No previous records and no suitable habitat within the study area.	No previous records and no suitable habitat in the pine plantations.
Lathamus discolor Swift Parrot	E, LM	E	EN	Occurs in dry sclerophyll eucalypt forests and woodlands (occasionally wet sclerophyll forests). The Swift Parrot is endemic to south-eastern Australia. It breeds only in Tasmania, and migrates to mainland Australia in autumn (to "overwinter": returns to Tasmania in early August). Recent Queensland records are from the Gold Coast, Noosa, Toowoomba, Warwick and Lockyer Valley areas (Department of the Environment, 2014c).	**Low potential to occur** No suitable habitat exists within the study area	**Low risk of impact** No previous records and no suitable habitat in the pine plantations.
Ninox strenua Powerful Owl	-	V	LC	Found in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Known to roost in sheltered groves of midstorey trees, or sometime pine plantations (Curtis et al. 2012) Mainly on the eastern side of the Great Dividing Range (Morcombe, 2003).	**High potential to occur** Previous records within Tuan State Forest	**Low risk of impact** 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

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Macronectes halli Northern Giant-Petrel	V	-	LC	The Northern Giant Petrel breeds in the sub-Antarctic, and visits areas off the Australian mainland mainly during the winter months (May-October).(Department of Environment, 2016)	**Low potential to occur.** Marine species	**Low risk of impact** No previous records and no suitable habitat in the pine plantations.
Pachyptila turtur subantarctica Fairy prion (southern)	V	-	LC	Breeding is currently known from only from two rock stacks off Macquarie Island (conservation advice, 2015).	**Low potential to occur** No previous records and no suitable habitat exists	**Low risk of impact** No previous records and no suitable habitat in the pine plantations.
Pterodroma neglecta neglecta Kermadec Petrel	V	-	LC	In Australia, the Kermadec Petrel (western) breeds on Balls Pyramid, which lies to the south of Lord Howe Island, and on Phillip Island, in the Norfolk Island group. It occasionally reaches the eastern coast of mainland Australia (Queensland and NSW).	**Low potential to occur** No previous records and no suitable habitat exists	**Low risk of impact** No previous records and no suitable habitat in the pine plantations.
Rostratula australis Australian painted snipe (Syn. *Rostratula benghalensis*)	E, LM, MW	V	EN	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 waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (Department of the Environment, 2014f).	**Low potential to occur** No previous records and no suitable habitat exists	**Low risk of impact** No previous records and no suitable habitat in the pine plantations. Turbine infrastructure sited away from low-lying areas and waterbodies.
Turnix melanogaster *Black-breasted Button-quail*	V	V	NT	Prefer drier low closed forests, particularly semi-evergreen vine thickets restricted to coastal and near-coastal regions of south-eastern Queensland and north-eastern New South Wales	**Low potential to occur.** No previous records and no suitable habitat.	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Deep leaf litter seems important (Department of the Environment, 2014g).		No previous records and no suitable habitat in the pine plantations.
Migratory Birds						
Apus pacificus Fork-tailed swift	LM, MM	C	LC	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).	**High potential to occur (flyover).** No previous records within Tuan or Toolara State Forest. Previous records in adjacent Great Sandy National Park.	**Low risk of impact** Further risk assessments undertaken during concurrent EPBC approval process.
Ardea alba *(Syn. A. modesta)* Great Egret, White Egret	LM, MW	C	-	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)	**Moderate potential to occur.** No previous records	**Low risk of impact** Low risk of impact due to predominant foraging behaviour in low-lying areas. Movement inland between the coast and inland wetland habitats could expose this species to collision risk. The likely impact on the Australian population is considered low.
Ardea ibis Cattle egret (Syn. *Bubulcus ibis)*	LM, MW	C	LC	Occurs in moist pastures with tall grass, shallow open wetlands and margins and also mudflats (Morcombe, 2003).	**Moderate potential to occur.** No previous records	**Low risk of impact** Low risk of impact due to predominant foraging behaviour in low-lying areas. Movement inland between the coast and inland wetland habitats could expose this species to collision risk. The

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
						likely impact on the Australian population is considered low.
Calidris canutus Red Knot, Knot	M, Ma, E		LC	Found in flocks on large, sheltered intertidal sand and mudflats during the austral summer. Feed on bivalves, crustaceans and other invertebrates at the receding tide. Rarely encountered inland. Northern Arnhem Land coast is important land during the non-breeding season (Garnett, S.T., Szabo, J.K., and Dutson, 2011)	**Low potential to occur** SPRAT database – roosting known to occur within region. 1 previous record from the Great Sandy National Park (Wildlife Online). Low potential to occur within study area due to specific habitat requirements.	**Low risk of impact** Low risk of impact due to specific habitat requirements that restrict the species to intertidal areas.
Calidris tenuirostris Great Knot	M, Ma, CE		VU	Inhabit the same habitat as Red Knot, and are often found in flocks with, the Red Knot (see above)(Garnett, S.T., Szabo, J.K., and Dutson, 2011)	**Low potential to occur** Low potential to occur within study area due to specific habitat requirements. 1 previous record in Great Sandy National Park (Wildlife Online).	**Low risk of impact** Low risk of impact due to specific habitat requirements that restrict the species to intertidal areas.
Charadrius leschenaultii Greater Sand Plover	M, Ma, V		LC	Only seen in Australia from July-December, with an influx of individuals into the Top End of the NT during October. Inhabit littoral and estuarine habitats, mainly on sheltered beaches with large sand or mudflats, though observations have been made in estuary lagoons, inshore reefs, small rocky islands and sand cays on coral reefs. Occasionally sighted on near-coastal salt lakes and brackish swamps. Roosting generally takes place on sand-spits and banks on beaches or in tidal lagoons, higher up the beach than other waders (can be well above the high tide mark) (Department of the Environment, 2016a)	**Low potential to occur** Previous records exist for Great Sandy Strait although it is not considered an internationally important site for this species.	**Low risk of impact** Low risk of impact due to specific habitat requirements that restrict the species to intertidal areas.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Coracina tenuriostris Cicadabird	LM	C	LC	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).	**Moderate potential to occur** No previous records although suitable habitat exists in the adjacent National Park.	**Low risk of impact** Low risk of impact due to habitat preferences.
Haliaeetus leucogaster White-bellied sea-eagle	LM, MT	C	LC	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).	**Known to occur (flyover)** No roosting habitat observed in the study area although would roost in the adjacent National Park. Likely fly-over species due to large home ranges.	**Low risk of impact** Further risk assessments undertaken during concurrent EPBC approval process.
Hirundapus caudacutus White-throated Needletail	LM, MT	C	LC	Summer migrant (October – April). Occurs in high open spaces above wide range of habitats, such as oceans, ranges and headlands (Morcombe, 2003).	**Known to occur (flyover)** Previous records in Great Sandy National Park	**Low risk of impact** Further risk assessments undertaken during concurrent EPBC approval process.
Hydroprogne caspia Caspian tern	LM, MI	SL	LC	Within Australia, the Caspian Tern has a widespread occurrence and is found in both coastal and inland habitat. Occurs mostly in sheltered coastal harbours, lagoons, inlets, bays, estuaries and river deltas. Areas with sandy or muddy margins are preferred. They can also be found on near-coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes, waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and salt works (Department of the Environment, 2015g).	**Low potential to occur** No previous records within study area although has been recorded in Great Sandy National Park.	**Low risk of impact** Low risk of impact due to habitat preferences.
Macronectes giganteus Southern Giant-Petrel	E, LM, MI	E	LC	Marine bird that occurs in Antarctic to subtropical waters. It is widespread throughout the southern ocean. It occurs in both pelagic and inshore waters	**Low potential to occur.** Marine species	**Low risk of impact** Low risk of impact due to habitat preferences.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				and is attracted to land at sewage outfalls (Department of the Environment, 2015j).		
Merops ornatus Rainbow bee-eater	LM, MT	C	LC	Summer migrant (September – April) although in northern Australia they remain and breed. 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).	**Known to occur.** Observed during site reconnaissance.	**Low risk of impact** Low risk of impact due to typical flight height (below rotor height). Further risk assessments undertaken during concurrent EPBC approval process.
Monarcha melanopsis Black-faced monarch	LM, MT	C	LC	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)	**Moderate potential to occur** No previous records although suitable habitat exists in the adjacent National Park.	**Low risk of impact** Low risk of impact due to habitat preferences and typical flight height.
Monarcha trivirgatus (syn. Symposiachrus trivirgatus) Spectacled Monarch	LM, MT	C	LC	Resident of NE Queensland and migrates to SE Queensland. Found mainly in rainforests but also can be found in mangroves, swamps and watercourse thickets. (Morcombe, 2003)	**Moderate potential to occur** No previous records although suitable habitat exists in the adjacent National Park.	**Low risk of impact** Low risk of impact due to habitat preferences and typical flight height.
*Pandion haliaetus (*Syn. *P. cristatus)* Eastern osprey	LM, MI	C	LC	Eastern ospreys occur in littoral and coastal habitats and terrestrial wetlands, and occasionally travel inland along major rivers. They require extensive areas of open fresh, brackish or saline water for foraging. (Department of the Environment, 2015o)	**Low potential to occur** No previous records and no suitable breeding or foraging habitat exists within the study area.	**Low risk of impact** Low risk of impact due to habitat preferences.
Rhipidura rufifrons Rufous Fantail	LM, MT	C	LC	Found in rainforest, dense wet eucalypt and monsoon forest, swamps, riverside vegetation. Found in open country on migration.(Morcombe, 2003)	**Moderate potential to occur** No previous records however suitable habitat exists in the study area	**Low risk of impact** Low risk of impact due to habitat preferences and typical flight height.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Great Sandy Strait - EAA Flyway						
Charadrius mongolus Lesser Sand Plover	M, Ma		LC	Recorded along most of the coastline of the NT, in particular the North Arnhem coast, Mud Blue Bay, coast between Anson Bay and Murgenella creek and the Port McArthur area (Chatto, 2003). Inhabits mud and sandflats in sheltered bays, estuaries, harbours, and occasionally rocky outcrops, sandy beaches and coral reefs. Roosting occurs near foraging areas (Department of the Environment, 2016b). Migratory shorebird of the EAA. Seven important non-breeding sites in Australia; one being the Great Sandy Strait.	**Known to occur in Great Sandy Straits** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005)	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.
Limosa lapponica baueri Bar-tailed Godwit	Ma, M		LC	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 (Department of the Environment, 2015h; Morcombe, 2003). Breeds in eastern Russia and Alaska (Migratory Shorebirds of the East Asian – Australiasian Flyway)	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Migratory shorebird of the EAA. Seven important non-breeding sites in Australia; one being the Great Sandy Strait.		
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit	Ma, M			As per *Limosa lapponica baueri,* although breeds in northern central Russia (Migratory Shorebirds of the East Asian – Australiasian Flyway). Migratory shorebird of the EAA. Seven important non-breeding sites in Australia; one being the Great Sandy Strait.	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.
Tringa brevipes Grey-tailed tattler	Ma, M			Within Australia, the Grey-tailed Tattler has a primarily northern coastal distribution and is found in most coastal regions. In Queensland it is found along the entire coast, with small numbers located in the Gulf of Carpentaria. The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It 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 (Department of the Environment, 2016d).	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Migratory shorebird of the EAA. The Great Sandy Strait is an important non-breeding site in Australia (Bamford et al., 2008).		
Tringa nebularia Common greenshank			LC	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). Migratory shorebird of the EAA. The Great Sandy Strait is an important non-breeding site in Australia (Bamford et al., 2008).	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.
Xenus cinereus Terek Sandpiper	Ma, M			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 (*Halosarcia spp.*). Birds are seldom near the edge of water, however, birds may wade into the water (Department of the Environment, 2016e). here appear to be two waves of migration down the eastern coast: one in August or September and one in November (Department of the Environment, 2016e) Widespread in coastal Queensland, from south-east of the Gulf of Carpentaria, north to Torres Strait and along the eastern coast to south-east Australia.	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Migratory shorebird of the EAA. The Great Sandy Strait is an important non-breeding site in Australia (Bamford et al., 2008).		
Numenius madagascariensis Eastern Curlew	CE, LM, MI	NT	LC	Associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sand flats (Morcombe, 2003). Migratory shorebird of the EAA. Non-breeding period in Australia (Bamford et al, 2008).	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.
Numenius phaeopus Whimbrel	LM, MI	SL	LC	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(Department of the Environment, 2015n). Migratory shorebird of the EAA. Non-breeding period in Australia (Bamford et al, 2008).	**Known to occur in the Great Sandy Strait** as a summer migrant (non-breeding). Previous collision risk assessment (Biosis, 2005) for this species has considered it unlikely to be at risk of rotor strike due to specific habitat requirements that restrict the species distribution to intertidal areas (Biosis, 2005).	**Low risk of impact** Low risk of impact due to specific habitat preferences. Further risk assessments undertaken during concurrent EPBC approval process.

EPBC Act (species listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), Aust.): Ex= Extinct CE = Critically Endangered E = Endangered, V = Vulnerable, MM = Migratory Marine, MT = Migratory Terrestrial, MW = Migratory Wetlands, LM = Listed Marine MI=Listed Migratory

NC Act (species listed under the Nature Conservation (Wildlife) Regulation 2006 Act (NC Act), QLD):PE: Extinct in the Wild CE: Critically Endangered E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern, C = Least Concern

IUCN (species listed under the International Union for Conservation of Nature (IUCN) Red List of Threatened Species) EX= Extinct, EW= Extinct in the Wild, CR= Critically Endangered, EN= Endangered, VU= Vulnerable, NT=Near Threatened, LC= Least Concern

Six (6) albatross species were reported in the SPRAT. All species have been excluded as they inhabit marine habitats not within the study area.

Table 7 Likelihood of Occurrence - Flora

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Acacia attenuata	V	V	-	This species occurs on flat coastal lowland plains, at altitudes of lower than 30 m above sea level, typically occurring in seasonally waterlogged areas of wet heathland or heathland margins, open forest and woodland communities, and specifically on sandy poorly drained soils or peat swamps which are infertile. The species has been recorded growing in shrublands with *Leptospermum whitei* and *Baeckea frutescens*; in wallum with *Banksia aemula* and *Eucalyptus robusta*; in woodlands with *Corymbia trachyphloia, E. umbra* and *Banksia oblongifolia*; and in open forests of *E. umbra, E. racemosa* and *Melaleuca quinquenervia* and has been found in disturbed environments, such as roadsides subject to vegetation control. (Department of the Environment, 2016)	**High potential to occur** Previous records within Toolara State Forest (Wildlife Online)	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Acacia baueri subsp. Baueri Tiny wattle		V		This species is found on infertile and often seasonally waterlogged sands in coastal heath (wallum) habitat and adjacent plateaus and low open woodland (DEHP, 2016).	**Moderate potential to occur** Previous records in Great Sandy National Park	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Archidendron lovelliae Bacon wood	V	V		Bacon Wood is a small tree, generally growing to 8 m and, less commonly, to 20 m. Bacon Wood has	**High potential to occur (in broader study area)**	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				a slender trunk and lightly rounded canopy. The leaves are bipinnate, with velvety, hairy ovoid leaflets 3-12 cm long. Flowers are red and occur in dense terminal clusters, with a mass of long stamens. Bacon Wood occurs in south-east Queensland, from the Cooloola to Fraser Island and the Wide Bay district. Bacon Wood occurs mostly on well-drained sandy loam soils, which are often alluvial in origin and contain clay or deep podosols. Bacon Wood occurs in wet sclerophyll woodland, subtropical lowland rainforest or riverine-type gallery forest. (Department of Environment, 2016)	Previous records within Toolara State Forest (Wildlife Online). No suitable habitat in elevated turbine locations or in heathland. Only suitable habitat is along Tinana Creek	Minimal disturbance of native vegetation for Project infrastructure.
Boronia keysii Key's boronia	V	V	-	Key's Boronia is an open shrub to 2 m high with deep rose-pink or white flowers. This species is found in lowland areas up to 20 m above sea level, where it is usually scattered through the understorey. It is found in mixed eucalypt and Brushbox *Lophostemon confertus* woodland, ranging to open forest, and varying in height from 8-35 m. The taller habitats are dominated by *Eucalyptus grandis* and *E. intermedia* with well developed vineforest understorey. This species has a restricted distribution in the Noosa Plains area, between Kin Kin and Lake Cootharaba, east of Gympie, Qld. More specifically, it occurs in an area of approximately 150 ha on the lower Kin Kin Ck and upper Noosa R. basins, east of the private property of Tarangau.	**Low potential to occur** Although previous records within Toolara State Forest (Wildlife Online). No suitable habitat exists in the elevated wind turbine location nor in the observed gullies / creek lines within the study area.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
Boronia rivularis Wide Bay boronia	-	NT	-	A shrub to 2 m that flowers in spring and early summer and is found mainly on sandy soil on Fraser Island and Cooloola. (Haslam, 2004)	**High potential to occur** Previous records within Toolara State Forest (Wildlife Online). Unlikely to occur in pine plantations.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Bosistoa transversa (*Bosistoa selwynii*) Three-leaved Bosistoa, Yellow Satinheart	V	-	-	Three-leaved Bosistoa grows in lowland subtropical rainforest up to 300 m above sea level. (Department of the Environment, 2015c)	**Low potential to occur** No previous records and no suitable habitat exists	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel	V	V	-	The Stinking Cryptocarya is restricted to coastal sands, or if not, then close to the coast, occurring in littoral rainforest on old sand dunes and subtropical rainforests over slate and occasionally on basalt to an altitude of 150 m. Associated species include *Syzygium hemilamprum* (Broad-leaved Lilly Pilly), *Acronychia imperforata* (Beach Acronychia), *Cryptocarya triplinervis* (Three-veined Laurel), *Cupaniopsis anacardioides* (Tuckeroo), *Flindersia bennettiana* (Bennet's Ash), *Lophostemon confertus* (Brush Box) and *Syzygium luehmannii* (Small-leaved Lilly Pilly). (Department of the Environment, 2015d)	**Low potential to occur** No previous records and no suitable habitat exists	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Cryptostylis hunteriana Leafless Tongue-orchid	V	-	-	The Leafless Tongue-orchid has been reported to occur in a wide variety of habitats including heathlands, heathy woodlands, sedgelands, *Xanthorrheoa* spp. plains, dry sclerophyll forests	**Low potential to occur** No previous records.	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				(shrub/grass sub-formation and shrubby sub-formation), forested wetlands, freshwater wetlands, grasslands, grassy woodlands, rainforests and wet sclerophyll forests (grassy sub-formation). Soils are generally considered to be moist and sandy, however, this species is also known to grow in dry or peaty soils. In south east Queensland, the associated plant community is *Banksia* spp./*Eucalyptus* spp. wallum heath. (Department of the Environment, 2015e). Tin Can Bay is the northern most distribution of this species.	Unlikely to occur in pine plantations. Suitable habitat in the northern portion of the study area is outside of the current know range.	Minimal disturbance of native vegetation for Project infrastructure.
Cupaniopsis shirleyana Wedge-leaf tuckeroo	V			Wedge-leaf Tuckeroo is known from south-eastern Queensland over a range of approximately 450 km, between Brisbane and Curtis Island (SHG, 2006). Wedge-leaf Tuckeroo occurs in a number of small populations throughout its range, in dry rainforest and scrubby urbanised areas on moderate to very steep slopes, screeslope gullies and rocky stream channels at elevations of 60–550 m above sea level (Conservation Advice, 2008)	**Low potential to occur** No previous records or suitable habitat	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Fontania rostrata	V	V		Fontainea rostrata is a tree or shrub growing 7–12 m high and is known from ten sites in the Gympie district, Teddington Weir and Mt Theebine near Glenwood, in Queensland, covering a distance of 100 km (BRI collection records, n.d.). This species occurs in notophyll vine forest on soil derived from metamorphic rock (Approved Conservation Advice, 2008).	**High potential to occur (Tinana Creek).** Suitable habitat along Tinana Creek. No suitable habitat in the eastern portion of the study area.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				The main potential threats to Fontainea rostrata include clearing of vegetation, fire, invasion by weeds, and potential impacts of stochastic events due to restricted distribution.		
Macadamia integrifolia Macadamia nut	V			The Macadamia Nut is a medium-sized tree which can grow to approximately 20 m in height with a similar crown width, giving the tree a rounded shape. The Macadamia Nut grows in remnant rainforest, preferring partially open areas such as rainforest edges.	**Moderate potential to occur** No previous records. Only suitable habitat is associated with Tinana Creek in areas with transitional rainforest. No suitable habitat exists in the eastern portion of the study area.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Macrozamia pauli-guilielmi Pineapple Zamia	E	E	EN	*Macrozamia pauli-guilielmi* occurs in lowland (5–230 m altitude) open forest or woodland (wallum) dominated by banksias or eucalypts, or in shrub land or heath land, generally on stabilised sand dunes. (Queensland Herbarium, 2007)	**High potential to occur** Previous records within Toolara State Forest (Wildlife Online) Potential habitat exists in the remnant heath vegetation in the northern portion of the study area, road reserves and mature stands of pine plantations.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Phaius australis Lesser Swamp-orchid	E	E	-	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp	**Low potential to occur** No suitable habitat exists and no previous records	**Low risk of impact**

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (*Lophostemon suaveolens*)), swampy rainforest (often with sclerophyll emergents), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*). This orchid species is relatively adaptable in its requirements for light and soil type. Soils range from acidic waterlogged peat, with a pH of 4.2 to peaty-sand, with a pH of 7.0. Soil parent materials include marine aeolian sand, the most common substrate, alluvium, granite, metasediments, hailstone gravel and sandstone. Soil types on sand range from shallow peat to humus/groundwater podzol. (Department of the Environment, 2015p)		Minimal disturbance of native vegetation for Project infrastructure.
Phebalium distans Mt Berryman Phebalium	CE	E	-	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period. Vegetation associations in which Mt Berryman	**Low potential to occur** No suitable habitat exists and no previous records	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Phebalium occur include microphyll to notophyll vine forest with or without *Araucaria cunninghamii* and low microphyll vine forest and semi-evergreen vine thicket with or without *Araucaria cunninghamii* which can be divided further into regional ecosystems depending on substrate, geography and associated vegetation species. (Department of the Environment, 2015q)		
Pterostylis chaetophora		E		A Terrestrial orchid with a slender flowering stem to 40 cm. The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey. Flowers from September to November.	**Low potential to occur** 1 previous record within Toolara State Forest (Wildlife Online). No suitable habitat was observed during the site reconnaissance.	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.
Samadera bidwillii Quassia	V	V	-	Endemic to Queensland and occurs in lowland rainforest most commonly but can also be found in other forest types. Commonly found in areas adjacent to watercourses. Found on a range of soil types including lithosols, skeletal soils, loam soils, sands, silts and sands with clay subsoils. (DoE, 2013) Quassia is a small shrub or tree that grows to about 6 m in height, with red flowers and red fruit occurring from November to March. Branchlets are ribbed, with fine, pale-brown hairs. Its leaves are 4.5–9 cm long, 6–12 mm wide, glabrous (hairless) or sometimes silky to pubescent only on the lower surface, with secondary veins numerous and regularly arranged. Leaves are stiff and leathery,	**Known to occur** Previous records within Tuan State Forest (Wildlife Online). Known to occur along Tinana Creek	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				narrow-elliptic or lanceolate, blunt or bluntly pointed, the margins bent under. They are green, glossy and hairless above, and sparsely hairy below. Quassia flowers occur in clusters of 1–4, and each flower has 8–10 stamens, with filaments densely villous (covered in small hairs) on the outer surface, the sepals are 0.75 to 1 mm long and the red petals are approximately 2.5 mm in length. The fruit are ovid-ellipsoid, 1 cm long, hairy and sometimes appear winged (George 1985; Harden 2000; Williams et al. 1984). Quassia is endemic to Queensland and is currently known to occur in several localities between Scawfell Island, near Mackay, and Goomboorian, north of Gympie (QDNR 2001). Quassia has been confirmed as occurring in at least 40 sites (QDNR 2001). Included within this range are a number of populations along the Mary River; Tinana Creek, Tallegalla Weir, Teddington Weir pondage, and from Teddington Weir to Tiana Barrage (Belleng Pty Ltd 2004		
Thesium australe Austral Toadflax, Toadflax	V	V	-	Austral Toadflax is semi-parasitic on roots of Kangaroo Grass (*Themeda triandra*) and a range of other grass species. The species occurs in subtropical, temperate and subalpine climates over a wide range of altitudes on soils derived from sedimentary, igneous and metamorphic geology including black clay loams to yellow podzolics and peaty loams. (Department of the Environment, 2014)	**Low potential to occur** No suitable habitat exists and no previous records	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				Austral Toadflax occurs in shrubland, grassland or woodland, often on damp sites. Vegetation types include open grassy heath dominated by Swamp Myrtle (*Leptospermum myrtifolium*), Small-fruit Hakea (*Hakea microcarpa*), Alpine Bottlebrush (*Callistemon sieberi*), Woolly Grevillea (*Grevillea lanigera*), Coral Heath (*Epacris microphylla*) and *Poa* spp. (Griffith 1991); Kangaroo Grass grassland surrounded by *Eucalyptus* woodland; and grassland dominated by Barbed-wire Grass (*Cymbopogon refractus*). (Department of the Environment, 2014) The species flowers and fruits throughout the year on the coast and during summer at higher altitudes. In subalpine and tableland climates, the species dies back to rootstock during winter and resprouts in spring. In coastal areas the species persists all year round and may live for longer than two years. (Department of the Environment, 2014)		
Xanthostemon oppositifolius Southern Penda	V			It is known from Kin Kin-Boreen Point–Cooroy District, near Noosa; Teddington Weir, south of Maryborough; and Granite Creek and Broken Creek, south-west of Miriam Vale (Barry & Thomas 1994; Queensland Herbarium 2008b). In southern locations, southern penda occurs predominantly in riparian communities on slightly acid clayey sands to sandy clays derived from sedimentary and metasedimentary rocks. Associated vegetation includes notophyll vine	**High potential to occur** Previous records within Toolara State Forest (Wildlife Online). Only suitable habitat is along creeks in Western portion of study area such as Tinana Creek (provided riparian habitat	**Low risk of impact** Minimal disturbance of native vegetation for Project infrastructure.

Species Name	EPBC Act Status	NC Act Status	IUCN Status	Habitat Preference	Likelihood of Occurrence	Risk Assessment
				forest, simple notophyll mixed tall closed forest with *Araucaria cunninghamii var. cunninghamii* (hoop pine) emergents or in transitional rainforest where the upper stratum is composed mostly of tall sclerophyll elements with rainforest species restricted to a developing understorey or mid-storey (Barry & Thomas 1994). At Granite Creek sites, it occurs on hillside on metasediments or old volcanic rocks in araucarian notophyll vine forest (McDonald pers. comm. 2001). Department of the Environment (2016). Xanthostemon oppositifolius in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: http://www.environment.gov.au/sprat. Accessed Mon, 24 Oct 2016 09:35:46 +1100.	is vine forest / transitional rainforest). No suitable habitat in eastern portion of the study area.	

EPBC Act (species listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), Aust.): Ex= Extinct CE = Critically Endangered E = Endangered, V = Vulnerable, MM = Migratory Marine, MT = Migratory Terrestrial, MW = Migratory Wetlands, LM = Listed Marine MI=Listed Migratory

NC Act (species listed under the Nature Conservation (Wildlife) Regulation 2006 Act (NC Act), QLD):PE: Extinct in the Wild CE: Critically Endangered E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern, C = Least Concern

IUCN (species listed under the International Union for Conservation of Nature (IUCN) Red List of Threatened Species) EX= Extinct, EW= Extinct in the Wild, CR= Critically Endangered, EN= Endangered, VU= Vulnerable, NT=Near Threatened, LC= Least Concern

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APPENDIX C
DESKTOP SEARCH RESULTS

Australian Government
Department of the Environment and Energy

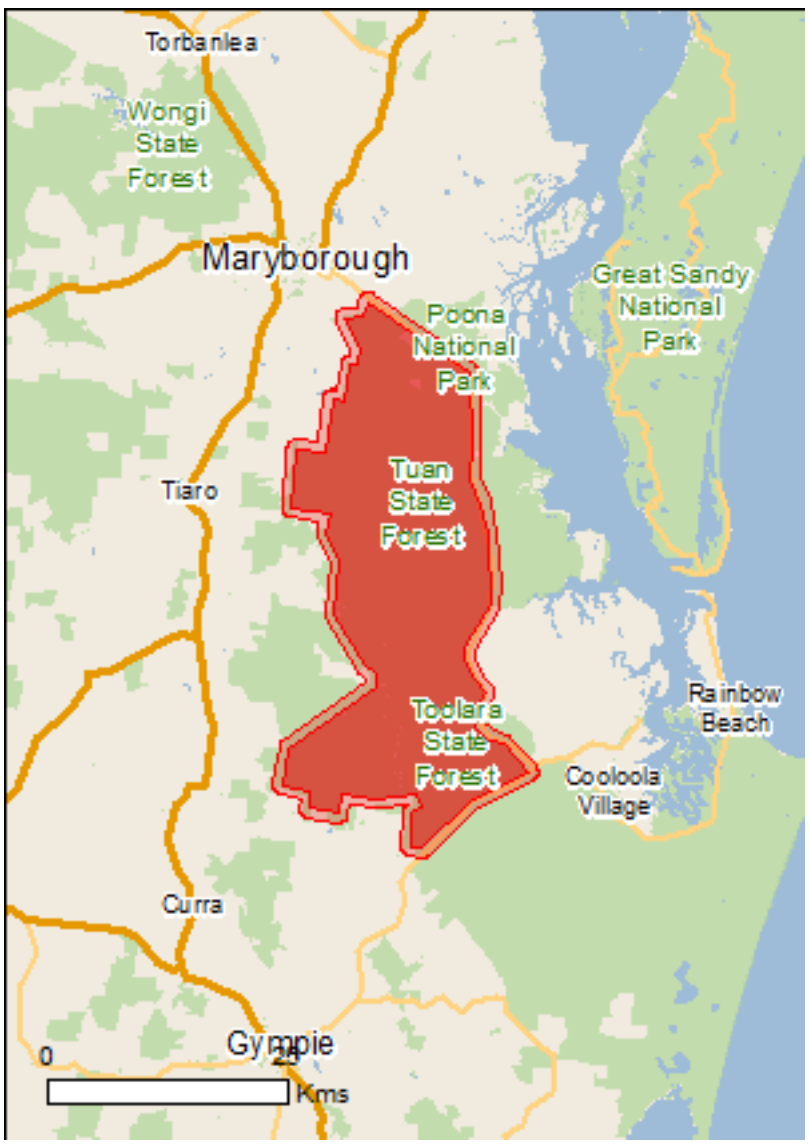
EPBC Act Protected Matters Report

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: 14/09/17 13:47:16



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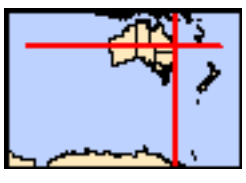
Coordinates

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:	1
Listed Threatened Species:	57
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
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	38
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 [Resource Information]

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

Name	Status	Type of Presence
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

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
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
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
Poephila cincta cincta		
Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to 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 iteratus		
Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
Insects		
Argynnis hyperbius inconstans		
Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi		
Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
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

Name	Status	Type of Presence
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 likely to 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
Other		
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
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 Balogia, 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
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

Name	Status	Type of Presence
		within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	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 [14747]	Endangered	Species or species habitat may 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
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]		Species or species habitat known to occur

Name	Threatened	Type of Presence 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 may 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 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

Name	Threatened	Type of Presence 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 may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species

Name	Threatened	Type of Presence
		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 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
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
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 Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur 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 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

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely 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

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 Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
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

Name	Status	Type of Presence
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
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
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Annona glabra Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish		Species or species

Name	Status	Type of Presence
Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		habitat likely to occur within area
Chrysanthemoides monilifera		
Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata		
Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora		
Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Dolichandra unguis-cati		
Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Protasparagus densiflorus		
Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Protasparagus plumosus		
Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
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

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

-25.56654 152.750652,-25.565301 152.749279,-25.565301 152.749279,-25.62475 152.844036,-25.685408 152.845409,-25.713869 152.844036,-25.736138 152.855022,-25.75964 152.860515,-25.779428 152.861889,-25.801685 152.864635,-25.820229 152.863262,-25.856073 152.838543,-25.867195 152.839916,-25.883258 152.849529,-25.894377 152.857769,-25.912907 152.846782,-25.922788 152.849529,-25.932669 152.861889,-25.936374 152.875621,-25.959836 152.898967,-25.982059 152.846782,-26.024024 152.80009,-26.02279 152.789104,-25.994403 152.790477,-25.9907 152.798717,-25.978355 152.793224,-25.982059 152.757518,-25.97959 152.724559,-25.994403 152.721813,-25.9907 152.694347,-25.975886 152.69572,-25.970948 152.669628,-25.940078 152.675121,-25.889435 152.756145,-25.87708 152.756145,-25.872137 152.747905,-25.827646 152.717693,-25.781901 152.723186,-25.758403 152.710827,-25.74356 152.713573,-25.738612 152.677868,-25.689121 152.681987,-25.692833 152.710827,-25.647036 152.71632,-25.648274 152.725933,-25.618559 152.732799,-25.617321 152.739666,-25.604937 152.741039,-25.578927 152.727306,-25.577689 152.745159,-25.56654 152.750652

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
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-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.

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Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Selected Area
Species: All
Type: All
Status: All
Records: Confirmed
Area: Neerdie State Forest 2
Email: paul.fox@premise.com.au
Date submitted: Wednesday 13 Sep 2017 14:58:46
Date extracted: Wednesday 13 Sep 2017 15:00:10

The number of records retrieved = 68

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		1
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		1
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		1
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		1
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		1
animals	birds	Artamidae	*Cracticus tibicen*	Australian magpie		C		1
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		1
animals	birds	Campephagidae	*Coracina tenuirostris*	cicadabird		C		1
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		1
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		1
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		1
animals	birds	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough		C		1
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		1
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		1
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		1
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		1
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		1
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		1
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		1
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		1
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		1
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		1
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		1
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		1
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		1
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		1
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		1
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		1
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		1
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		1
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		1
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		1
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		1
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		1
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		1
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		1
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		1
animals	ray-finned fishes	Percichthyidae	*Maccullochella mariensis*	Mary River cod			E	1/1
plants	cycads	Zamiaceae	*Macrozamia pauli-guilielmi*			E	E	1/1
plants	higher dicots	Acanthaceae	*Pseuderanthemum variabile*	pastel flower		C		1/1
plants	higher dicots	Asteraceae	*Pterocaulon redolens*			C		1/1
plants	higher dicots	Fabaceae	*Desmodium gunnii*			C		1/1
plants	higher dicots	Fabaceae	*Flemingia parviflora*	flemingia		C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum simulans*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Lamiaceae	*Plectranthus graveolens*	flea bush		C		1/1
plants	higher dicots	Malvaceae	*Sida hackettiana subsp. (Gayndah P.Grimshaw+ PG2388)*			C		1/1
plants	higher dicots	Phyllanthaceae	*Sauropus hirtellus*			C		1/1
plants	higher dicots	Polygalaceae	*Polygala triflora*			C		1/1
plants	monocots	Commelinaceae	*Commelina diffusa*	wandering jew		C		1/1
plants	monocots	Cyperaceae	*Isolepis cernua*	nodding club rush		C		1/1
plants	monocots	Cyperaceae	*Cyperus polystachyos var. polystachyos*			C		1/1
plants	monocots	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush		C		1/1
plants	monocots	Cyperaceae	*Cyperus trinervis*			C		1/1
plants	monocots	Cyperaceae	*Cyperus laevis*			C		1/1
plants	monocots	Hemerocallidaceae	*Dianella caerulea var. vannata*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra laxa*	broad-leaved matrush		C		1/1
plants	monocots	Laxmanniaceae	*Lomandra confertifolia subsp. pallida*			C		1/1
plants	monocots	Poaceae	*Aristida gracilipes*			C		1/1
plants	monocots	Poaceae	*Panicum simile*			C		1/1
plants	monocots	Poaceae	*Aristida vagans*			C		1/1
plants	monocots	Poaceae	*Digitaria ramularis*			C		1/1
plants	monocots	Poaceae	*Sporobolus natalensis*		Y			1/1
plants	monocots	Poaceae	*Dichelachne montana*			C		1/1
plants	monocots	Poaceae	*Sarga leiocladum*			C		2/2
plants	monocots	Poaceae	*Bothriochloa decipiens var. decipiens*			C		1/1
plants	monocots	Poaceae	*Panicum effusum*			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Selected Area
Species: All
Type: All
Status: All
Records: Confirmed
Area: Toolara State Forest
Email: paul.fox@premise.com.au
Date submitted: Wednesday 13 Sep 2017 15:22:30
Date extracted: Wednesday 13 Sep 2017 15:30:25

The number of records retrieved = 279

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			8
animals	amphibians	Hylidae	*Litoria olongburensis*	wallum sedgefrog		V	V	2
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		5/3
animals	amphibians	Hylidae	*Litoria gracilenta*	graceful treefrog		C		1
animals	amphibians	Hylidae	*Litoria freycineti*	wallum rocketfrog		V		6/3
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		1/1
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		2
animals	amphibians	Hylidae	*Litoria lesueuri sensu lato*	stony creek frog		C		1
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		11
animals	amphibians	Hylidae	*Litoria cooloolensis*	Cooloola sedgefrog		NT		1/1
animals	amphibians	Hylidae	*Litoria nasuta*	striped rocketfrog		C		2
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		1/1
animals	amphibians	Hylidae	*Litoria wilcoxii*	eastern stony creek frog		C		7
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		5
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		1
animals	amphibians	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog		C		4
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		1
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		11/1
animals	amphibians	Myobatrachidae	*Crinia signifera*	clicking froglet		C		4
animals	amphibians	Myobatrachidae	*Uperoleia fusca*	dusky gungan		C		2
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		C		1
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		1
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		1
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		1
animals	birds	Meliphagidae	*Myzomela obscura*	dusky honeyeater		C		1
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		1
animals	insects	Nymphalidae	*Hypocysta adiante adiante*	orange ringlet				1
animals	insects	Nymphalidae	*Acraea andromacha andromacha*	glasswing				1
animals	insects	Pieridae	*Belenois java teutonia*	caper white				1
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		2
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			12/10
animals	mammals	Muridae	*Melomys burtoni*	grassland melomys		C		2
animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		2
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	1
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		1
animals	ray-finned fishes	Melanotaeniidae	*Melanotaenia duboulayi*	crimsonspotted rainbowfish				1
animals	ray-finned fishes	Percichthyidae	*Maccullochella mariensis*	Mary River cod			E	5/5
animals	ray-finned fishes	Percichthyidae	*Nannoperca oxleyana*	Oxleyan pygmy perch		V	E	1
animals	ray-finned fishes	Plotosidae	*Tandanus tandanus*	freshwater catfish				1
animals	ray-finned fishes	Pseudomugilidae	*Pseudomugil signifer*	Pacific blue eye				1
animals	reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon		C		2/1
animals	reptiles	Agamidae	*Chlamydosaurus kingii*	frilled lizard		C		1
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		1
animals	reptiles	Chelidae	*Elseya albagula*	southern snapping turtle		E	CE	6
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		2
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Diplodactylidae	*Diplodactylus vittatus*	wood gecko		C		1
animals	reptiles	Elapidae	*Hemiaspis signata*	black-bellied swamp snake		C		2/1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		1
animals	reptiles	Pygopodidae	*Delma plebeia*	common delma		C		1/1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		1
animals	reptiles	Pygopodidae	*Pygopus lepidopodus*	common scaly-foot		C		1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		2
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		1
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		1
fungi	club fungi	Basidiomycota	*Microporellus*			C		1/1
fungi	club fungi	Basidiomycota	*Amanita*			C		1/1
fungi	club fungi	Basidiomycota	*Pisolithus marmoratus*			C		1/1
fungi	club fungi	Basidiomycota	*Polyporus dictyopus*			C		1/1
fungi	club fungi	Basidiomycota	*Ramaria*			C		1/1
fungi	club fungi	Basidiomycota	*Russula*			C		1/1
fungi	club fungi	Basidiomycota	*Cymatoderma elegans*			C		1/1
fungi	club fungi	Basidiomycota	*Trametes lactinea*			C		1/1
fungi	club fungi	Basidiomycota	*Typhula*			C		1/1
fungi	club fungi	Basidiomycota	*Hexagonia*			C		2/2
fungi	club fungi	Basidiomycota	*Tremella fimbriata*			C		1/1
fungi	club fungi	Basidiomycota	*Calyptella longipes*			C		1/1
fungi	club fungi	Basidiomycota	*Crepidotus*			C		1/1
fungi	club fungi	Basidiomycota	*Amanita ochrophylla*			C		1/1
fungi	club fungi	Basidiomycota	*Rhizopogon*			C		1/1
fungi	club fungi	Basidiomycota	*Ryvardenia*			C		1/1
plants	conifers	Araucariaceae	*Araucaria cunninghamii*	hoop pine		C		1
plants	conifers	Araucariaceae	*Agathis robusta*	kauri pine		C		1
plants	conifers	Podocarpaceae	*Podocarpus spinulosus*	dwarf plum-pine		C		1/1
plants	cycads	Zamiaceae	*Macrozamia pauli-guilielmi*			E	E	3/3
plants	ferns	Dryopteridaceae	*Arachniodes aristata*	prickly shield fern		C		1/1
plants	ferns	Lindsaeaceae	*Lindsaea incisa*			C		1/1
plants	ferns	Schizaeaceae	*Lygodium microphyllum*	snake fern		C		1/1
plants	higher dicots	Apocynaceae	*Tabernaemontana pandacaqui*	banana bush		C		2/2
plants	higher dicots	Apocynaceae	*Alyxia magnifolia*			C		3/2
plants	higher dicots	Apocynaceae	*Nerium oleander*	oleander	Y			1/1
plants	higher dicots	Apocynaceae	*Marsdenia fraseri*	narrow-leaved milk vine		C		3/3
plants	higher dicots	Apocynaceae	*Melodinus australis*	southern melodinus		C		1
plants	higher dicots	Araliaceae	*Astrotricha longifolia*	star hair bush		C		1/1
plants	higher dicots	Asteraceae	*Rutidosis murchisonii*			C		1/1
plants	higher dicots	Asteraceae	*Coreopsis lanceolata*		Y			1/1
plants	higher dicots	Asteraceae	*Cyanthillium cinereum*			C		1/1
plants	higher dicots	Byttneriaceae	*Commersonia bartramia*	brown kurrajong		C		2/2
plants	higher dicots	Byttneriaceae	*Seringia arborescens*			C		1/1
plants	higher dicots	Caesalpiniaceae	*Cassia tomentella*			C		2/2
plants	higher dicots	Carpodetaceae	*Abrophyllum ornans*			C		1/1
plants	higher dicots	Casuarinaceae	*Allocasuarina littoralis*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Celastraceae	*Denhamia celastroides*	broad-leaved boxwood		C		1
plants	higher dicots	Convolvulaceae	*Polymeria calycina*	pink bindweed		C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia linearis var. floribunda*			C		1/1
plants	higher dicots	Ebenaceae	*Diospyros yandina*			C		1/1
plants	higher dicots	Elaeocarpaceae	*Elaeocarpus reticulatus*	ash quandong		C		1/1
plants	higher dicots	Elaeocarpaceae	*Elaeocarpus eumundi*	Eumundi quandong		C		2
plants	higher dicots	Elaeocarpaceae	*Tetratheca thymifolia*			C		1/1
plants	higher dicots	Ericaceae	*Leucopogon leptospermoides*			C		1/1
plants	higher dicots	Ericaceae	*Agiortia pedicellata*			C		2/2
plants	higher dicots	Ericaceae	*Epacris pulchella*	wallum heath		C		1/1
plants	higher dicots	Euphorbiaceae	*Croton stigmatosus*	white croton		C		2/2
plants	higher dicots	Fabaceae	*Phyllota phylicoides*	yellow peabush		C		1/1
plants	higher dicots	Fabaceae	*Pultenaea myrtoides*			C		1/1
plants	higher dicots	Fabaceae	*Gompholobium pinnatum*	poor mans gold		C		1/1
plants	higher dicots	Fabaceae	*Hovea acutifolia*			C		2/2
plants	higher dicots	Fabaceae	*Aeschynomene falcata*		Y			1/1
plants	higher dicots	Fabaceae	*Oxylobium robustum*	tree shaggy pea		C		3/3
plants	higher dicots	Fabaceae	*Aotus lanigera*	pointed aotus		C		1/1
plants	higher dicots	Fabaceae	*Daviesia ulicifolia subsp. ulicifolia*			C		1/1
plants	higher dicots	Fabaceae	*Dillwynia retorta*			C		1/1
plants	higher dicots	Goodeniaceae	*Goodenia rotundifolia*			C		1/1
plants	higher dicots	Haloragaceae	*Gonocarpus micranthus subsp. ramosissimus*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum gracile var. gracile*			C		1/1
plants	higher dicots	Haloragaceae	*Gonocarpus chinensis subsp. verrucosus*			C		1/1
plants	higher dicots	Lamiaceae	*Gmelina leichhardtii*	white beech		C		1
plants	higher dicots	Loganiaceae	*Strychnos psilosperma*	strychnine tree		C		1/1
plants	higher dicots	Loganiaceae	*Mitrasacme paludosa*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia complanata*	flatstem wattle		C		1/1
plants	higher dicots	Mimosaceae	*Acacia ulicifolia*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia cincinnata*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia hubbardiana*			C		2/2
plants	higher dicots	Mimosaceae	*Acacia penninervis var. longiracemosa*			C		2/2
plants	higher dicots	Mimosaceae	*Acacia attenuata*			V	V	1/1
plants	higher dicots	Mimosaceae	*Acacia leiocalyx subsp. leiocalyx*			C		1/1
plants	higher dicots	Mimosaceae	*Archidendron grandiflorum*	lace flower tree		C		1/1
plants	higher dicots	Mimosaceae	*Acacia oshanesii*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia melanoxylon*	blackwood		C		1/1
plants	higher dicots	Mimosaceae	*Archidendron lovelliae*	bacon wood		V	V	1/1
plants	higher dicots	Mimosaceae	*Acacia suaveolens*	sweet wattle		C		1/1
plants	higher dicots	Myrtaceae	*Austromyrtus glabra*			C		1/1
plants	higher dicots	Myrtaceae	*Xanthostemon oppositifolius*	southern penda		V	V	2/2
plants	higher dicots	Myrtaceae	*Leptospermum whitei*			C		2/2
plants	higher dicots	Myrtaceae	*Melaleuca thymifolia*	thyme honeymyrtle		C		2/2
plants	higher dicots	Myrtaceae	*Eucalyptus pilularis*	blackbutt		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus racemosa*			C		1/1
plants	higher dicots	Myrtaceae	*Leptospermum polygalifolium*	tantoon		C		3/3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Myrtaceae	*Lophostemon confertus*	brush box		C		2
plants	higher dicots	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus racemosa subsp. racemosa*	scribbly gum		C		1/1
plants	higher dicots	Myrtaceae	*Melaleuca sieberi*			C		2/2
plants	higher dicots	Myrtaceae	*Melaleuca uncinata*			C		1/1
plants	higher dicots	Myrtaceae	*Leptospermum brachyandrum*	weeping tea-tree		C		1/1
plants	higher dicots	Myrtaceae	*Melaleuca pachyphylla*			C		3/3
plants	higher dicots	Myrtaceae	*Melaleuca nodosa*			C		1/1
plants	higher dicots	Myrtaceae	*Homoranthus virgatus*	twiggy homoranthus		C		1/1
plants	higher dicots	Myrtaceae	*Archirhodomyrtus beckleri*	rose myrtle		C		1/1
plants	higher dicots	Myrtaceae	*Corymbia gummifera*	red bloodwood		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus microcorys*			C		2/1
plants	higher dicots	Myrtaceae	*Acmena smithii*	lillypilly satinash		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus latisinensis*			C		3/3
plants	higher dicots	Myrtaceae	*Syncarpia glomulifera subsp. glomulifera*			C		2/1
plants	higher dicots	Myrtaceae	*Eucalyptus tindaliae*	Queensland white stringybark		C		1/1
plants	higher dicots	Myrtaceae	*Leptospermum speciosum*			C		3/3
plants	higher dicots	Myrtaceae	*Leptospermum liversidgei*			C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus resinifera*	red mahogany		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus grandis*	flooded gum		C		1
plants	higher dicots	Myrtaceae	*Gossia bidwillii*			C		1/1
plants	higher dicots	Myrtaceae	*Sannantha bidwillii*			C		1/1
plants	higher dicots	Myrtaceae	*Rhodamnia acuminata*	cooloola ironwood		C		1/1
plants	higher dicots	Myrtaceae	*Syzygium*			C		1/1
plants	higher dicots	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly		C		2/2
plants	higher dicots	Oleaceae	*Notelaea punctata*			C		1/1
plants	higher dicots	Oleaceae	*Notelaea longifolia*			C		1
plants	higher dicots	Phyllanthaceae	*Cleistanthus cunninghamii*	omega		C		1/1
plants	higher dicots	Picrodendraceae	*Petalostigma triloculare*	forest quinine		C		1/1
plants	higher dicots	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum		C		1/1
plants	higher dicots	Polygalaceae	*Polygala paniculata*		Y			1/1
plants	higher dicots	Proteaceae	*Strangea linearis*	strangea		C		2/2
plants	higher dicots	Proteaceae	*Grevillea hilliana*			C		1/1
plants	higher dicots	Proteaceae	*Persoonia virgata*	small-leaved geebung		C		1/1
plants	higher dicots	Proteaceae	*Hakea benthamii*			C		1/1
plants	higher dicots	Proteaceae	*Conospermum taxifolium*	devil's rice		C		2/2
plants	higher dicots	Proteaceae	*Banksia oblongifolia*	dwarf banksia		C		1/1
plants	higher dicots	Proteaceae	*Banksia robur*	broad-leaved banksia		C		1/1
plants	higher dicots	Proteaceae	*Hakea actites*			C		1/1
plants	higher dicots	Rhamnaceae	*Alphitonia petriei*	pink ash		C		1
plants	higher dicots	Rosaceae	*Rubus moluccanus var. trilobus*			C		1/1
plants	higher dicots	Rubiaceae	*Atractocarpus chartaceus*			C		1/1
plants	higher dicots	Rubiaceae	*Cyclophyllum coprosmoides*			C		1
plants	higher dicots	Rutaceae	*Boronia falcifolia*	wallum boronia		C		1/1
plants	higher dicots	Rutaceae	*Flindersia bennettii*			C		1
plants	higher dicots	Rutaceae	*Boronia keysii*	Key's boronia		V	V	3/3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Rutaceae	*Zieria minutiflora subsp. minutiflora*			C		1/1
plants	higher dicots	Rutaceae	*Halfordia kendack*	saffron heart		C		2/1
plants	higher dicots	Rutaceae	*Boronia rosmarinifolia*	forest boronia		C		1/1
plants	higher dicots	Rutaceae	*Boronia rivularis*	Wide Bay boronia		NT		4/4
plants	higher dicots	Rutaceae	*Zieria smithii*			C		1/1
plants	higher dicots	Rutaceae	*Zieria laxiflora*	wallum zieria		C		1/1
plants	higher dicots	Rutaceae	*Philotheca queenslandica*			C		2/2
plants	higher dicots	Rutaceae	*Flindersia australis*	crow's ash		C		1/1
plants	higher dicots	Rutaceae	*Zieria furfuracea subsp. euthadenia*			C		2/2
plants	higher dicots	Rutaceae	*Acronychia wilcoxiana*	silver aspen		C		2/1
plants	higher dicots	Rutaceae	*Flindersia schottiana*	bumpy ash		C		1
plants	higher dicots	Sapindaceae	*Mischocarpus pyriformis*			C		1
plants	higher dicots	Sapindaceae	*Sarcopteryx stipata*	steelwood		C		1
plants	higher dicots	Sapindaceae	*Mischocarpus pyriformis subsp. pyriformis*			C		1/1
plants	higher dicots	Sapindaceae	*Guioa acutifolia*	northern guioa		C		1
plants	higher dicots	Sapotaceae	*Pleioluma queenslandica*			C		1/1
plants	higher dicots	Sapotaceae	*Planchonella chartacea*			C		1
plants	higher dicots	Sterculiaceae	*Argyrodendron sp. (Kin Kin W.D.Francis AQ81198)*	rusty tulip oak		C		2/1
plants	higher dicots	Sterculiaceae	*Sterculia quadrifida*	peanut tree		C		1/1
plants	higher dicots	Stylidiaceae	*Stylidium debile*	frail trigger plant		C		1/1
plants	higher dicots	Symplocaceae	*Symplocos stawellii*			C		2/2
plants	higher dicots	Symplocaceae	*Symplocos thwaitesii*	buff hazelwood		C		1
plants	higher dicots	Vitaceae	*Cissus hypoglauca*			C		2/2
plants	higher dicots	Vitaceae	*Cissus sterculiifolia*			C		1
plants	liverworts	Lepidoziaceae	*Bazzania corbieri*			C		1/1
plants	liverworts	Lepidoziaceae	*Lepidozia*			C		1/1
plants	liverworts	Lepidoziaceae	*Bazzania*			C		1/1
plants	liverworts	Lepidoziaceae	*Zoopsis argentea*			C		1/1
plants	lower dicots	Annonaceae	*Melodorum leichhardtii*			C		1
plants	lower dicots	Lauraceae	*Cassytha filiformis*	dodder laurel		C		1/1
plants	lower dicots	Lauraceae	*Litsea leefeana*			C		1
plants	lower dicots	Lauraceae	*Beilschmiedia elliptica*	grey walnut		C		1
plants	lower dicots	Lauraceae	*Litsea reticulata*			C		1/1
plants	lower dicots	Lauraceae	*Endiandra discolor*	domatia tree		C		2/2
plants	lower dicots	Lauraceae	*Cryptocarya glaucescens*			C		1/1
plants	lower dicots	Lauraceae	*Cryptocarya macdonaldii*	McDonald's laurel		C		2/1
plants	lower dicots	Linderniaceae	*Lindernia crustacea*			C		1/1
plants	lower dicots	Menispermaceae	*Sarcopetalum harveyanum*	pearl vine		C		1
plants	lower dicots	Piperaceae	*Piper hederaceum var. hederaceum*			C		1/1
plants	monocots	Amaryllidaceae	*Zephyranthes carinata*		Y			1/1
plants	monocots	Arecaceae	*Calamus muelleri*	lawyer vine		C		1
plants	monocots	Cyperaceae	*Gahnia aspera*			C		1/1
plants	monocots	Cyperaceae	*Chorizandra sphaerocephala*			C		1/1
plants	monocots	Cyperaceae	*Rhynchospora rubra*			C		1/1
plants	monocots	Cyperaceae	*Lepironia articulata*			C		2/2
plants	monocots	Cyperaceae	*Lepidosperma laterale var. laterale*			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Cyperaceae	*Lepidosperma longitudinale*	pithy swordsedge		C		1/1
plants	monocots	Cyperaceae	*Cyperus polystachyos var. polystachyos*			C		1/1
plants	monocots	Cyperaceae	*Cyperus laevis*			C		1/1
plants	monocots	Cyperaceae	*Caustis recurvata*			C		1/1
plants	monocots	Cyperaceae	*Caustis blakei subsp. blakei*			C		1/1
plants	monocots	Cyperaceae	*Cyperus haspan*			C		1/1
plants	monocots	Cyperaceae	*Cyperus pilosus*			C		1/1
plants	monocots	Cyperaceae	*Gahnia clarkei*	tall sawsedge		C		2/2
plants	monocots	Cyperaceae	*Baumea teretifolia*			C		1/1
plants	monocots	Cyperaceae	*Schoenus apogon var. apogon*			C		1/1
plants	monocots	Eriocaulaceae	*Eriocaulon scariosum*			C		1/1
plants	monocots	Flagellariaceae	*Flagellaria indica*	whip vine		C		2/1
plants	monocots	Hemerocallidaceae	*Dianella caerulea var. assera*			C		1/1
plants	monocots	Hemerocallidaceae	*Dianella caerulea*			C		1/1
plants	monocots	Johnsoniaceae	*Tricoryne elatior*	yellow autumn lily		C		1/1
plants	monocots	Juncaceae	*Juncus prismatocarpus*	branching rush		C		1/1
plants	monocots	Laxmanniaceae	*Sowerbaea juncea*	vanilla plant		C		1/1
plants	monocots	Laxmanniaceae	*Lomandra longifolia*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra hystrix*			C		1/1
plants	monocots	Laxmanniaceae	*Cordyline rubra*	red-fruited palm lily		C		1
plants	monocots	Laxmanniaceae	*Lomandra confertifolia subsp. pallida*			C		1/1
plants	monocots	Orchidaceae	*Caladenia carnea*			C		2/2
plants	monocots	Orchidaceae	*Cryptostylis subulata*	large tounge orchid		C		1/1
plants	monocots	Orchidaceae	*Pterostylis sp. (Toolara R.Crane 1322)*			E		1/1
plants	monocots	Orchidaceae	*Corybas aconitiflorus*			C		1/1
plants	monocots	Orchidaceae	*Pterostylis antennifera*			C		1/1
plants	monocots	Orchidaceae	*Eriochilus*			C		1/1
plants	monocots	Orchidaceae	*Dipodium variegatum*			C		1/1
plants	monocots	Orchidaceae	*Microtis parviflora*	slender onion orchid		C		1/1
plants	monocots	Orchidaceae	*Acianthus fornicatus*	pixie caps		C		1/1
plants	monocots	Orchidaceae	*Glossodia minor*	small wax lip orchid		C		1/1
plants	monocots	Orchidaceae	*Caleana major*	flying duck orchid		C		1/1
plants	monocots	Orchidaceae	*Thelymitra angustifolia*			C		1/1
plants	monocots	Orchidaceae	*Lyperanthus suaveolens*	brown beaks		C		1/1
plants	monocots	Poaceae	*Entolasia stricta*	wiry panic		C		1/1
plants	monocots	Poaceae	*Paspalum mandiocanum*		Y			1/1
plants	monocots	Poaceae	*Andropogon virginicus*	whiskey grass	Y			2/2
plants	monocots	Poaceae	*Ottochloa nodosa*			C		1/1
plants	monocots	Poaceae	*Eragrostis bahiensis*		Y			1/1
plants	monocots	Restionaceae	*Leptocarpus tenax*			C		1/1
plants	monocots	Restionaceae	*Sporadanthus caudatus*			C		1/1
plants	monocots	Restionaceae	*Baloskion tetraphyllum subsp. meiostachyum*			C		1/1
plants	monocots	Restionaceae	*Baloskion pallens*			C		1/1
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea fulva*	swamp grasstree		C		1/1
plants	mosses	Lembophyllaceae	*Camptochaete excavata*			C		1/1
plants	mosses	Polytrichaceae	*Dawsonia polytrichoides*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	mosses	Rhizogoniaceae	*Pyrrhobryum paramattense*			C		1/1
plants	spike mosses	Selaginellaceae	*Selaginella uliginosa*	swamp selaginella		C		1/1
plants		Notothyladaceae	*Phaeoceros carolinianus*			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Selected Area
Species: All
Type: All
Status: All
Records: Confirmed
Area: Tuan State Forest
Email: paul.fox@premise.com.au
Date submitted: Wednesday 13 Sep 2017 15:21:54
Date extracted: Wednesday 13 Sep 2017 15:30:51

The number of records retrieved = 275

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			3
animals	amphibians	Hylidae	*Litoria freycineti*	wallum rocketfrog		V		1
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		23
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		1
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		4
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		19/3
animals	amphibians	Myobatrachidae	*Uperoleia sp.*					1/1
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		1
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		1
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		1
animals	birds	Cacatuidae	*Calyptorhynchus funereus*	yellow-tailed black-cockatoo		C		1
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		1
animals	birds	Casuariidae	*Dromaius novaehollandiae*	emu		C		3
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		1
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		1
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		1
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		1
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		1
animals	birds	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird		C		1
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		1
animals	birds	Meliphagidae	*Phylidonyris niger*	white-cheeked honeyeater		C		1
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		1
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		1
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		1
animals	birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet		C		1
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		1
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		1
animals	insects	Nymphalidae	*Melanitis leda bankia*	evening brown				2
animals	insects	Pieridae	*Delias argenthona argenthona*	scarlet jezebel				1
animals	insects	Pieridae	*Eurema hecabe*	large grass-yellow				1
animals	mammals	Canidae	*Canis lupus familiaris*	dog	Y			1
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		12/9
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		2/2
animals	mammals	Dugongidae	*Dugong dugon*	dugong		V		1
animals	mammals	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat		C		2/1
animals	mammals	Macropodidae	*Macropus rufogriseus*	red-necked wallaby		C		1
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		1
animals	mammals	Muridae	*Rattus fuscipes*	bush rat		C		2
animals	mammals	Muridae	*Melomys burtoni*	grassland melomys		C		1
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			4
animals	mammals	Muridae	*Xeromys myoides*	water mouse		V	V	41/1
animals	mammals	Muridae	*Rattus tunneyi*	pale field-rat		C		2/1
animals	mammals	Muridae	*Melomys sp.*					1
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		1
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		V	V	1/1
animals	mammals	Suidae	*Sus scrofa*	pig	Y			1
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		1
animals	mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat		C		1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		1
animals	mammals	Vespertilionidae	*Scoteanax rueppellii*	greater broad-nosed bat		C		4/1
animals	mammals	Vespertilionidae	*Chalinolobus nigrogriseus*	hoary wattled bat		C		1
animals	mammals	Vespertilionidae	*Scotorepens sp.*					1
animals	ray-finned fishes	Percichthyidae	*Maccullochella mariensis*	Mary River cod			E	2/2
animals	reptiles	Agamidae	*Diporiphora nobbi*	nobbi		C		5/1
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		2
animals	reptiles	Agamidae	*Diporiphora australis*	tommy roundhead		C		2/2
animals	reptiles	Agamidae	*Chlamydosaurus kingii*	frilled lizard		C		1
animals	reptiles	Chelidae	*Elseya albagula*	southern snapping turtle		E	CE	1
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		1
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		2/2
animals	reptiles	Diplodactylidae	*Oedura tryoni*	southern spotted velvet gecko		C		2/2
animals	reptiles	Diplodactylidae	*Amalosia rhombifer*	zig-zag gecko		C		1
animals	reptiles	Elapidae	*Hemiaspis signata*	black-bellied swamp snake		C		5/4
animals	reptiles	Scincidae	*Lampropholis amicula*	friendly sunskink		C		1
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		3/2
animals	reptiles	Scincidae	*Carlia vivax*	tussock rainbow-skink		C		2/2
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		1
animals	reptiles	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis		C		5/1
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		21/19
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		3
animals	reptiles	Typhlopidae	*Anilios wiedii*	brown-snouted blind snake		C		1
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		1
fungi	club fungi	Basidiomycota	*Chlorophyllum molybdites*	green-spored parasol		C		1/1
fungi	club fungi	Basidiomycota	*Lycoperdon*			C		1/1
plants	cycads	Zamiaceae	*Macrozamia pauli-guilielmi*			E	E	22/20
plants	cycads	Zamiaceae	*Macrozamia douglasii*			C		7/7
plants	ferns	Adiantaceae	*Cheilanthes sieberi*			C		1
plants	ferns	Adiantaceae	*Adiantum silvaticum*			C		1/1
plants	ferns	Blechnaceae	*Blechnum camfieldii*			C		1/1
plants	ferns	Blechnaceae	*Blechnum nudum*	fishbone water fern		C		1/1
plants	ferns	Dennstaedtiaceae	*Hypolepis muelleri*	swamp bracken		C		1/1
plants	ferns	Dennstaedtiaceae	*Pteridium esculentum*	common bracken		C		4
plants	ferns	Lindsaeaceae	*Lindsaea dimorpha*			C		1/1
plants	ferns	Osmundaceae	*Todea barbara*	king fern		C		1/1
plants	ferns	Polypodiaceae	*Microsorum scandens*	fragrant climbing fern		C		1/1
plants	higher dicots	Anacardiaceae	*Mangifera indica*	mango	Y			1
plants	higher dicots	Apiaceae	*Platysace linearifolia*			C		1/1
plants	higher dicots	Apiaceae	*Apium prostratum*			C		1
plants	higher dicots	Araliaceae	*Astrotricha longifolia*	star hair bush		C		1/1
plants	higher dicots	Asteraceae	*Baccharis halimifolia*	groundsel bush	Y			1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Asteraceae	*Conyza*					1
plants	higher dicots	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	Y			1
plants	higher dicots	Asteraceae	*Praxelis clematidea*		Y			2/2
plants	higher dicots	Asteraceae	*Crassocephalum crepidioides*	thickhead	Y			1
plants	higher dicots	Boraginaceae	*Echium plantagineum*	Paterson's curse	Y			1/1
plants	higher dicots	Byttneriaceae	*Commersonia bartramia*	brown kurrajong		C		1
plants	higher dicots	Campanulaceae	*Lobelia purpurascens*	white root		C		1
plants	higher dicots	Casuarinaceae	*Allocasuarina littoralis*			C		4
plants	higher dicots	Casuarinaceae	*Allocasuarina torulosa*			C		1
plants	higher dicots	Celastraceae	*Denhamia celastroides*	broad-leaved boxwood		C		1/1
plants	higher dicots	Chenopodiaceae	*Suaeda australis*			C		1/1
plants	higher dicots	Cucurbitaceae	*Zehneria cunninghamii*	slender cucumber		C		1/1
plants	higher dicots	Cunoniaceae	*Schizomeria ovata*	white cherry		C		1/1
plants	higher dicots	Cunoniaceae	*Bauera capitata*	clustered bauera		C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia salicifolia*			C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia vestita*			C		1
plants	higher dicots	Elaeocarpaceae	*Elaeocarpus reticulatus*	ash quandong		C		1/1
plants	higher dicots	Ericaceae	*Sprengelia sprengelioides*	sprengelia		C		1/1
plants	higher dicots	Ericaceae	*Woollsia pungens*			C		1
plants	higher dicots	Ericaceae	*Acrotriche aggregata*	red cluster heath		C		2
plants	higher dicots	Ericaceae	*Leucopogon deformis*			C		2/2
plants	higher dicots	Euphorbiaceae	*Ricinocarpos pinifolius*	wedding bush		C		1/1
plants	higher dicots	Fabaceae	*Hardenbergia violacea*			C		1
plants	higher dicots	Fabaceae	*Stylosanthes viscosa*		Y			1/1
plants	higher dicots	Fabaceae	*Gompholobium pinnatum*	poor mans gold		C		1
plants	higher dicots	Fabaceae	*Crotalaria*			C		2
plants	higher dicots	Fabaceae	*Jacksonia scoparia*			C		1
plants	higher dicots	Fabaceae	*Oxylobium robustum*	tree shaggy pea		C		1/1
plants	higher dicots	Fabaceae	*Hovea acutifolia*			C		1
plants	higher dicots	Fabaceae	*Bossiaea heterophylla*	variable bossiaea		C		1/1
plants	higher dicots	Fabaceae	*Hovea clavata*			C		2/2
plants	higher dicots	Fabaceae	*Gompholobium virgatum*			C		1/1
plants	higher dicots	Fabaceae	*Bossiaea dasycarpa*			C		1/1
plants	higher dicots	Goodeniaceae	*Velleia spathulata*	wild pansies		C		1/1
plants	higher dicots	Goodeniaceae	*Goodenia rotundifolia*			C		1
plants	higher dicots	Lamiaceae	*Mentha satureioides*	native pennyroyal		C		1/1
plants	higher dicots	Lamiaceae	*Chloanthes parviflora*			C		1/1
plants	higher dicots	Lamiaceae	*Westringia tenuicaulis*	tufted westringia		C		1
plants	higher dicots	Loganiaceae	*Mitrasacme paludosa*			C		1/1
plants	higher dicots	Malvaceae	*Hibiscus heterophyllus*			C		1
plants	higher dicots	Melastomataceae	*Melastoma malabathricum subsp. malabathricum*			C		2
plants	higher dicots	Meliaceae	*Synoum glandulosum subsp. glandulosum*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia aulacocarpa*			C		3
plants	higher dicots	Mimosaceae	*Acacia bakeri*	marblewood		C		1/1
plants	higher dicots	Mimosaceae	*Acacia leiocalyx*			C		2
plants	higher dicots	Mimosaceae	*Acacia attenuata*			V	V	3/3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Mimosaceae	*Acacia suaveolens*	sweet wattle		C		1
plants	higher dicots	Mimosaceae	*Acacia flavescens*	toothed wattle		C		2
plants	higher dicots	Mimosaceae	*Acacia complanata*	flatstem wattle		C		4/2
plants	higher dicots	Mimosaceae	*Acacia ulicifolia*			C		1
plants	higher dicots	Myrsinaceae	*Myrsine variabilis*			C		1
plants	higher dicots	Myrtaceae	*Melaleuca quinquenervia*	swamp paperbark		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus bancroftii*	Bancroft's red gum		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus drepanophylla*			C		1/1
plants	higher dicots	Myrtaceae	*Lophostemon suaveolens*	swamp box		C		2
plants	higher dicots	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus acmenoides*			C		1
plants	higher dicots	Myrtaceae	*Corymbia gummifera*	red bloodwood		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus tereticornis*			C		1
plants	higher dicots	Myrtaceae	*Melaleuca salicina*			C		1
plants	higher dicots	Myrtaceae	*Eucalyptus tindaliae*	Queensland white stringybark		C		1/1
plants	higher dicots	Myrtaceae	*Melaleuca bracteata*			C		1
plants	higher dicots	Myrtaceae	*Eucalyptus resinifera*	red mahogany		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus portuensis*			C		1/1
plants	higher dicots	Myrtaceae	*Sannantha bidwillii*			C		2/2
plants	higher dicots	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly		C		2/1
plants	higher dicots	Myrtaceae	*Tristaniopsis laurina*			C		1
plants	higher dicots	Myrtaceae	*Corymbia citriodora*	spotted gum		C		2
plants	higher dicots	Myrtaceae	*Leptospermum polygalifolium*	tantoon		C		1
plants	higher dicots	Myrtaceae	*Micromyrtus leptocalyx*			C		1
plants	higher dicots	Myrtaceae	*Lophostemon confertus*	brush box		C		1
plants	higher dicots	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		3
plants	higher dicots	Myrtaceae	*Eucalyptus racemosa subsp. racemosa*	scribbly gum		C		3
plants	higher dicots	Myrtaceae	*Pilidiostigma rhytispermum*			C		1/1
plants	higher dicots	Myrtaceae	*Backhousia myrtifolia*	carrol		C		1/1
plants	higher dicots	Myrtaceae	*Angophora leiocarpa*	rusty gum		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus siderophloia*			C		2/1
plants	higher dicots	Phyllanthaceae	*Phyllanthus microcladus*			C		3/3
plants	higher dicots	Phyllanthaceae	*Glochidion ferdinandi*			C		2
plants	higher dicots	Phyllanthaceae	*Breynia oblongifolia*			C		1
plants	higher dicots	Picrodendraceae	*Petalostigma pubescens*	quinine tree		C		1
plants	higher dicots	Picrodendraceae	*Petalostigma triloculare*	forest quinine		C		4/1
plants	higher dicots	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum		C		1/1
plants	higher dicots	Pittosporaceae	*Billardiera scandens*			C		1/1
plants	higher dicots	Pittosporaceae	*Pittosporum spinescens*			C		1
plants	higher dicots	Plantaginaceae	*Veronica plebeia*	trailing speedwell		C		1/1
plants	higher dicots	Proteaceae	*Persoonia cornifolia*	broad-leaved geebung		C		1
plants	higher dicots	Proteaceae	*Persoonia virgata*	small-leaved geebung		C		4/1
plants	higher dicots	Proteaceae	*Xylomelum benthamii*			C		2
plants	higher dicots	Proteaceae	*Banksia aemula*	wallum banksia		C		1
plants	higher dicots	Proteaceae	*Banksia spinulosa*			C		1
plants	higher dicots	Proteaceae	*Hakea actites*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Proteaceae	*Banksia oblongifolia*	dwarf banksia		C		1
plants	higher dicots	Proteaceae	*Grevillea reptans*			C		1/1
plants	higher dicots	Proteaceae	*Petrophile shirleyae*			C		2/1
plants	higher dicots	Proteaceae	*Conospermum taxifolium*	devil's rice		C		2/1
plants	higher dicots	Proteaceae	*Strangea linearis*	strangea		C		1
plants	higher dicots	Proteaceae	*Banksia robur*	broad-leaved banksia		C		1/1
plants	higher dicots	Proteaceae	*Banksia spinulosa var. spinulosa*			C		1/1
plants	higher dicots	Proteaceae	*Hakea benthamii*			C		1
plants	higher dicots	Proteaceae	*Banksia integrifolia*			C		3
plants	higher dicots	Proteaceae	*Lomatia silaifolia*	crinkle bush		C		2
plants	higher dicots	Rhamnaceae	*Alphitonia excelsa*	soap tree		C		2
plants	higher dicots	Rubiaceae	*Gynochthodes jasminoides*			C		1
plants	higher dicots	Rubiaceae	*Atractocarpus chartaceus*			C		1/1
plants	higher dicots	Rubiaceae	*Richardia brasiliensis*	white eye	Y			1/1
plants	higher dicots	Rubiaceae	*Opercularia diphylla*			C		1/1
plants	higher dicots	Rubiaceae	*Psychotria loniceroides*	hairy psychotria		C		3/2
plants	higher dicots	Rutaceae	*Zieria minutiflora*			C		1
plants	higher dicots	Rutaceae	*Boronia rivularis*	Wide Bay boronia		NT		1/1
plants	higher dicots	Rutaceae	*Halfordia kendack*	saffron heart		C		1/1
plants	higher dicots	Rutaceae	*Phebalium woombye*	wallum phebalium		C		3/2
plants	higher dicots	Rutaceae	*Acronychia imperforata*	beach acronychia		C		1
plants	higher dicots	Sapindaceae	*Dodonaea triquetra*	large-leaved hop bush		C		4/2
plants	higher dicots	Sapindaceae	*Jagera pseudorhus*			C		1
plants	higher dicots	Simaroubaceae	*Samadera bidwillii*			V	V	3/1
plants	higher dicots	Solanaceae	*Solanum nodiflorum*		Y			1
plants	higher dicots	Stylidiaceae	*Stylidium graminifolium*	grassy-leaved trigger-flower		C		2/1
plants	higher dicots	Symplocaceae	*Symplocos thwaitesii*	buff hazelwood		C		1/1
plants	higher dicots	Thymelaeaceae	*Pimelea linifolia subsp. linifolia*			C		1/1
plants	higher dicots	Violaceae	*Hybanthus enneaspermus*					2
plants	higher dicots	Vitaceae	*Cayratia*			C		1
plants	higher dicots	Vitaceae	*Cissus hypoglauca*			C		2/1
plants	lower dicots	Lauraceae	*Cassytha pubescens*	downy devil's twine		C		1/1
plants	lower dicots	Lauraceae	*Cassytha filiformis*	dodder laurel		C		1/1
plants	lower dicots	Lauraceae	*Cryptocarya glaucescens*			C		3/1
plants	lower dicots	Lauraceae	*Endiandra sieberi*	hard corkwood		C		2/1
plants	lower dicots	Menispermaceae	*Hypserpa decumbens*			C		1/1
plants	lower dicots	Menispermaceae	*Stephania japonica*			C		1
plants	lower dicots	Winteraceae	*Tasmannia insipida*	brush pepperbush		C		1/1
plants	monocots	Amaryllidaceae	*Crinum*			C		1
plants	monocots	Arecaceae	*Livistona*			C		1
plants	monocots	Arecaceae	*Archontophoenix cunninghamiana*	piccabeen palm		C		1/1
plants	monocots	Arecaceae	*Livistona decora*			C		1
plants	monocots	Cyperaceae	*Lepidosperma laterale*			C		2/1
plants	monocots	Cyperaceae	*Baumea muelleri*			C		1/1
plants	monocots	Cyperaceae	*Gahnia aspera*			C		1
plants	monocots	Cyperaceae	*Caustis recurvata*			C		3/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Cyperaceae	*Rhynchospora heterochaeta*			C		1/1
plants	monocots	Cyperaceae	*Gahnia sieberiana*	sword grass		C		1
plants	monocots	Cyperaceae	*Caustis blakei subsp. blakei*			C		1/1
plants	monocots	Eriocaulaceae	*Eriocaulon nanum*			C		1/1
plants	monocots	Eriocaulaceae	*Eriocaulon australe*			C		1/1
plants	monocots	Flagellariaceae	*Flagellaria indica*	whip vine		C		1
plants	monocots	Hemerocallidaceae	*Dianella caerulea*			C		2
plants	monocots	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily		C		1
plants	monocots	Hemerocallidaceae	*Dianella rara*			C		1/1
plants	monocots	Hemerocallidaceae	*Dianella*			C		1
plants	monocots	Johnsoniaceae	*Tricoryne elatior*	yellow autumn lily		C		1
plants	monocots	Johnsoniaceae	*Tricoryne anceps subsp. pterocaulon*			C		1
plants	monocots	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra longifolia*			C		1
plants	monocots	Laxmanniaceae	*Sowerbaea juncea*	vanilla plant		C		1/1
plants	monocots	Orchidaceae	*Eriochilus cucullatus*			C		1
plants	monocots	Orchidaceae	*Genoplesium acuminatum*			C		2/1
plants	monocots	Orchidaceae	*Genoplesium sagittiferum*			C		1
plants	monocots	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid		C		1/1
plants	monocots	Orchidaceae	*Prasophyllum elatum*	tall leek orchid		C		1
plants	monocots	Orchidaceae	*Thelymitra pauciflora*	slender sun orchid		C		1
plants	monocots	Orchidaceae	*Caladenia carnea*			C		1/1
plants	monocots	Orchidaceae	*Corybas undulatus*	tailed helmet orchid		C		1/1
plants	monocots	Orchidaceae	*Geodorum densiflorum*	pink nodding orchid		C		1
plants	monocots	Orchidaceae	*Spiranthes sinensis*	austral ladies tresses		C		1
plants	monocots	Orchidaceae	*Pterostylis russellii*			C		1/1
plants	monocots	Orchidaceae	*Spiranthes australis*			C		1/1
plants	monocots	Orchidaceae	*Orthoceras strictum*	horned orchid		C		2/1
plants	monocots	Orchidaceae	*Cymbidium suave*			C		1
plants	monocots	Pandanaceae	*Freycinetia scandens*			C		1/1
plants	monocots	Poaceae	*Oplismenus aemulus*	creeping shade grass		C		1
plants	monocots	Poaceae	*Themeda triandra*	kangaroo grass		C		3
plants	monocots	Poaceae	*Melinis repens*	red natal grass	Y			1
plants	monocots	Poaceae	*Ottochloa nodosa*			C		1
plants	monocots	Poaceae	*Aristida warburgii*			C		1/1
plants	monocots	Poaceae	*Cymbopogon refractus*	barbed-wire grass		C		1
plants	monocots	Poaceae	*Eriachne glabrata*			C		1/1
plants	monocots	Poaceae	*Imperata cylindrica*	blady grass		C		2
plants	monocots	Poaceae	*Andropogon virginicus*	whiskey grass	Y			1/1
plants	monocots	Poaceae	*Digitaria parviflora*			C		1
plants	monocots	Smilacaceae	*Smilax glyciphylla*	sweet sarsaparilla		C		2
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea*			C		1
plants	monocots	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*			C		2
plants	monocots	Zingiberaceae	*Alpinia arundelliana*			C		1/1
plants	monocots	Zingiberaceae	*Alpinia caerulea*	wild ginger		C		1/1
plants	mosses	Leucobryaceae	*Leucobryum*			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

APPENDIX D
FIELD DATA

Table 8 Bird species list by site, date and time

			8 December 2016				15 March 2017						
			PC1-1	PC1-2	PC1-3	PC1-4	PC2-1	PC2-2	PC2-3	PC2-4	PC2-5	PC2-6	PC2-7
Family	**Species**	**Common name**	**7:21-7:41**	**7:58-8:18**	**13:59-14:19**	**14:50-15:10**	**10:01-10:21**	**10:32-10:52**	**11:11-11:31**	**11:44-12:04**	**12:23-12:43**	**12:56-13:16**	**13:28-13:48**
Accipitridae	*Haliastur sphenurus*	Whistling kite							X				
Apodidae	*Hirundapus caudacutus*	White-throated needletail	X	X				X					
Artamidae	*Cracticus tibicen*	Australian magpie		X				X					
Artamidae	*Cracticus torquatus*	Grey butcherbird	X			X	X	X		X	X	X	X
Campephagidae	*Coracina novaehollandiae*	Black-faced cuckoo-shrike				X							
Campephagidae	*Coracina tenuirostris*	Cicadabird	X										
Casuariidae	*Dromaius novaehollandiae*	Emu		X									
Cisticolidae	*Cisticola exilis*	Golden-headed cisticola	X	X									
Climacteridae	*Cormobates leucophaea*	White-throated treecreeper						X					
Columbidae	*Geopelia humeralis*	Bar-shouldered dove								X	X	X	
Columbidae	*Macropygia amboinensis*	Brown cuckoo-dove		X					X				
Columbidae	*Phaps chalcoptera*	Common bronzewing						X					
Columbidae	*Ptilinopus superbus*	Superb fruit-dove				X							
Corvidae	*Corvus orru*	Torresian crow					X		X				X
Cuculidae	*Chalcites lucidus*	Shining bronze-cuckoo	X										
Estrildidae	*Neochmia temporalis*	Red-browed finch		X			X	X		X			
Estrildidae	*Taeniopygia bichenovii*	Double-barred finch		X					X				
Halcyonidae	*Dacelo novaeguineae*	Laughing kookaburra					X			X			
Maluridae	*Malurus lamberti*	Variegated fairy-wren	X	X			X				X		
Meliphagidae	*Lichenostomus chrysops*	Yellow-faced honeyeater	X										
Meliphagidae	*Lichmera indistincta*	Brown honeyeater						X	X				
Meliphagidae	*Manorina melanocephala*	Noisy miner									X	X	
Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater	X	X	X		X			X	X	X	

			8 December 2016				15 March 2017						
			PC1-1	PC1-2	PC1-3	PC1-4	PC2-1	PC2-2	PC2-3	PC2-4	PC2-5	PC2-6	PC2-7
Family	**Species**	**Common name**	**7:21-7:41**	**7:58-8:18**	**13:59-14:19**	**14:50-15:10**	**10:01-10:21**	**10:32-10:52**	**11:11-11:31**	**11:44-12:04**	**12:23-12:43**	**12:56-13:16**	**13:28-13:48**
Meliphagidae	*Philemon corniculatus*	Noisy friarbird					X	X		X			
Meropidae	*Merops ornatus*	Rainbow bee-eater		X	X	X			X				
Monarchidae	*Myiagra inquieta*	Restless flycatcher				X							
Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	X						X				
Nectariniidae	*Dicaeum hirundinaceum*	Mistletoebird			X	X					X	X	
Oriolidae	*Oriolus sagittatus*	Olive-backed oriole	X	X									
Pachycephalidae	*Colluricincla harmonica*	Grey shrike-thrush				X				X		X	
Pachycephalidae	*Pachycephala pectoralis*	Golden whistler						X					
Pachycephalidae	*Pachycephala rufiventris*	Rufous whistler	X	X	X	X	X	X		X	X	X	X
Petroicidae	*Eopsaltria australis*	Eastern yellow robin				X						X	X
Psittacidae	*Alisterus scapularis*	Australian king-parrot				X							
Psittacidae	*Trichoglossus haematodus*	Rainbow lorikeet								X	X		
Rhipiduridae	*Rhipidura fuliginosa*	Grey fantail				X	X				X		
Rhipiduridae	*Rhipidura leucophrys*	Willie wagtail						X	X				
Timaliidae	*Zosterops lateralis*	Silvereye	X	X				X					
		Site Richness	**12**	**13**	**4**	**11**	**9**	**12**	**8**	**9**	**9**	**8**	**4**

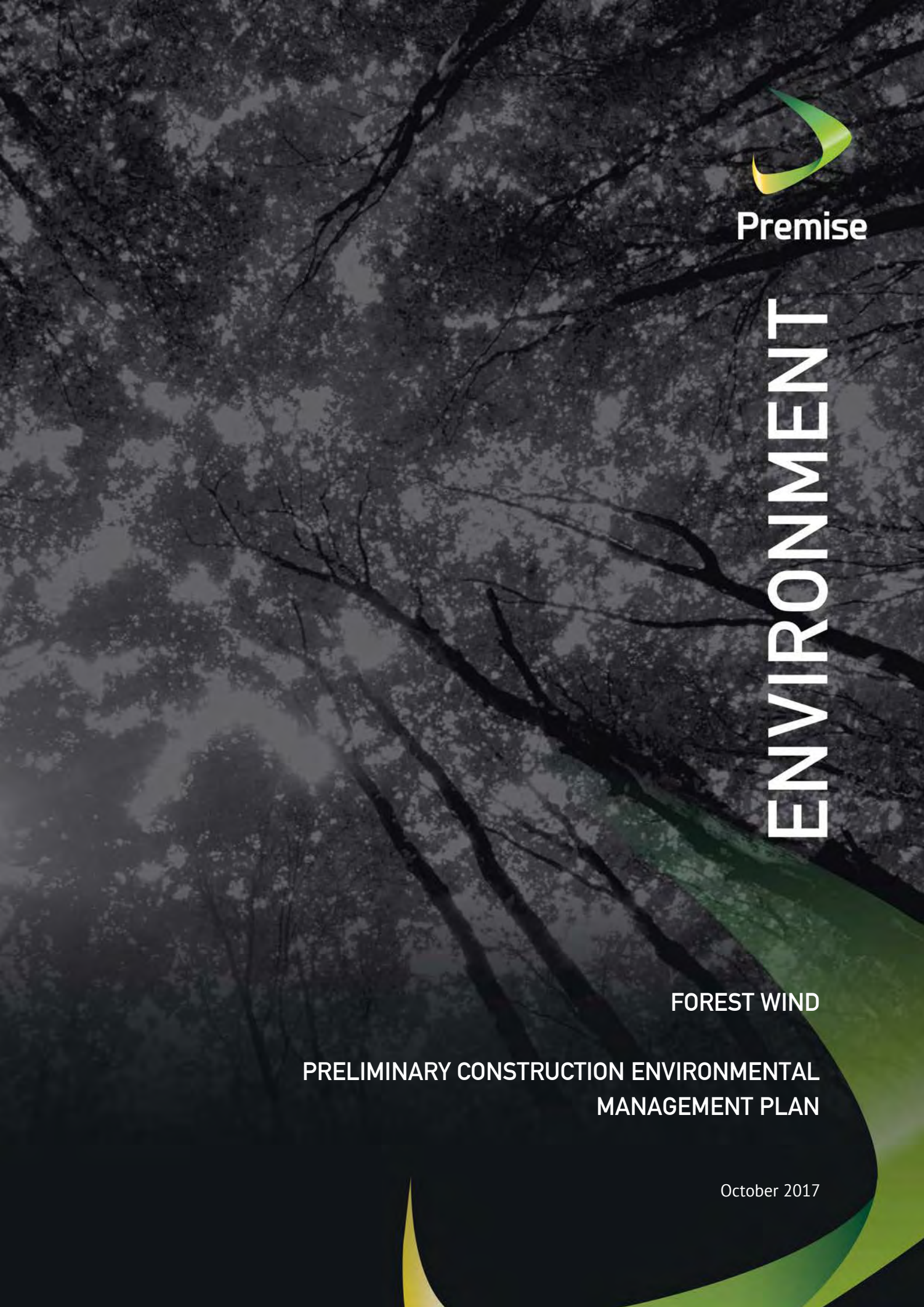
Table 9 Flying-fox camp locations and observations

Map No.	Location	Notes	Observations 07.12.16
161	Gympie Township, Widgee	Nationally Important Flying-fox Colony. 23 km (southwest) from the closest wind turbine corridor in the southern area which is the corridor starting in Neerdie State Forest. 56 km from the northern most corridor.	This camp shows consistency in its activity. Since the National Flying-fox census started in 2012, there has been 15 census surveys. All but 4 of those have reported GHFF in numbers greater than 2,500 and one survey (May 2015) reported numbers greater than 50,000. The May 2017 survey reported GHFF estimates of 500 – 2,500 individuals.
2	Sunshine Acres, Black Swamp	25km north of scoping area boundary.	1-499 blacks in 2015. Camp inactive since 2015 survey.
4	Maryborough, Saltwater Creek	Surveyed but no flying-foxes were found	The camp was surveyed in February 2017, and no flying-foxes were found. [1]
5	Maryborough, Tinana Island	Surveyed but none found. Blacks in 2016.	Access from bank (within 500m). No direct or indirect observations of activity.
6	Maryborough, Little Tinana (north of 5)	Blacks in 2013 (cat 3). None since then. GHFF in 2012 (cat 4). No flying-foxes since 2013.	Access from bank (within 150m). No direct or indirect observations of activity.
7	Tinana, Franklins Close	Surveyed but none found	Not active
8	Kent St, Maryborough	13 km northwest of the closest turbine corridor (corridor leading off Maryborough – Cooloola Road) and 50km from the furthest turbine. Blacks (cat 2) in 2016. GHFF (cat 5) in 2015	Active: GHFF = category 1; BFF = category 3
9	Albion Road Wetlands (Island plantation 533)	GHFF in 2013 (cat 3) and 2014 (cat 2). Blacks (cat 2) in 2015. None in 2016.	Not active
10	Maaroom, Esplanade	Surveyed but no flying-foxes were found. GHFF were present (10,000 – 15,999) in 2015 and Blacks (2,500 – 9,999)	Not active
11	Boonaroo Point, Maroom. End of Davies Road	Surveyed but no flying-foxes were found	Not active
12	Glenwood. End of Arbor Three Road. On Gutchy Creek. West of Glenwood Varley Road. -25.92745; 152.62588	National flying-fox census reported GHFF estimates of 2,500 – 9,999 in November 2016 (and an equal number of black flying-foxes).	Location behind private property. Access obtained within 200m of mapped camp. No direct or indirect observations of activity.
13	Dinnies Ck, opposite Inskip	This location was surveyed in August 2015 and no flying foxes were found. [1]	Can't see or access this location. Attempt made from Palm Drive, Tinnanbar. Requires boat access for survey. No direct or indirect observations of activity in the area.
18	Rainbow Beach Road, Seary's Creek	Not surveyed and considered inactive	Not active

Map No.	Location	Notes	Observations 07.12.16
19	Goomboorian, Anderleigh Rd, Ginger Creek. -26.04874, 152.77788. Tinana Creek	Little reds and blacks. Large little red camp in 2016 (16,000 – 49,999). Blacks (2,500 – 9,999). GHFF in 2015 (10,000 – 15,999). GHFF also in 2013 but not in 2014. Closest active colony to study area. Approximately 8km south of nearest turbine corridor. This is not mapped as a Nationally Important Colony.	Active: GHFF = category 3; BFF = category 1
20	Needie Power St. -25.99844; 152.7566 Griffith St off Red Reidge Rd.	Camp not surveyed and considered inactive	Not active
21	Esplanade off Salmon St, Tin Can Bay (Snapper Point location 564)	Camp surveyed in 2012 but no flying-foxes were found	Not active
22	Rainbow beach, Inskip.	Not surveyed and considered inactive	Not active on initial site reconnaissance (Nov 2016)

1 – National flying-fox monitoring data

APPENDIX E
PRELIMINARY ENVIRONMENTAL MANAGEMENT PLAN



FOREST WIND

PRELIMINARY CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

October 2017

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1 INTRODUCTION

CleanSight Pty Ltd proposes to develop a wind farm project and associated infrastructure across the Gympie Regional Council (GRC) and Fraser Coast Regional Council (FCRC) local government areas (LGA).
Wind farm developments have the potential to impact on flora, fauna and associated ecological processes within and surrounding the development area, including bird and bat strikes and barotrauma (physical damage due to sudden changes in air pressure), in addition to potential impacts on the migratory routes of individual bird species (Department of Infrastructure, 2016).

1.1 Purpose

This preliminary Construction Environmental Management Plan (CEMP) is for the implementation of appropriate site management to ensure contractors working for CleanSight minimise, control and monitor any impact on the environment while undertaking construction works and also during operation of the project.

It is considered that locating the Project in an exotic pine plantation is the most effective mitigation measure to avoid any significant impacts occurring to terrestrial and aquatic flora and fauna, including bird and bat species. Ongoing monitoring and adaptive management during operation of the Project will indicate whether any further mitigation is required.

1.2 Statutory and Policy Requirements

The project team have a "General Environmental Duty" under Section 319 of the *Environmental Protection Act 1994* (EP Act). It an offence under the EP Act to carry out any activity that causes, or is likely to cause, environmental harm unless all reasonable and practical measures have been taken to prevent or minimise the potential harm.

In addition to the EP Act all development must comply with the relevant provisions of Commonwealth and State Legislation including but not limited to:

- *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth);*
- *Sustainable Planning Act 2009 (SP Act);*
- *Nature Conservation Act 1992(NC Act);*
- *Vegetation Management Act 1999 (VM Act);*
- *Water Act 2000;*
- *Queensland Heritage Act 1992;*
- *Aboriginal Cultural Heritage Act 2003;*
- *Coastal Protection and Management Act 1995 (CPM Act).*

Development must also comply with several statutory instruments including State Planning Policies, State government policies and local government planning schemes.

1.3 Project Location and Details

The study area is within the broader scoping area of Toolara, Tuan and Neerdie State Forests. State forests consist predominantly of exotic pine plantations and are operated by HQ Plantations. The pine trees in the plantations are harvested 30 – 35 years after planting. The study area consists of

a mosaic of pine in various ages of the plant rotation. Many waterways and drainage lines within the pine plantations have historically been cleared of most of their riparian vegetation; in most cases, there remains a sparse single row of regrowth melaleuca delineating the creek line from surround landforms.

The proposed development may include:

- up to 300 large wind turbines (1,200MW of wind power capacity) with a tip height of up to 240m;
- access tracks;
- electrical reticulation between wind turbines (underground or overhead);
- crane hardstands and laydown areas for infrastructure;
- operation compounds; and
- Temporary facilities such as construction compounds and concrete batching plants.

The project is situated within pine plantation forests and allows a level of flexibility with final micro-siting of turbines and access tracks away from sensitive areas such as patches of remnant vegetation which occur in small pockets (eg. along waterways) within the pine plantations.

1.4 Roles and Responsibilities

The organisational structure of the proposed works will generally comprise a Construction Engineer/Supervisor, Site Supervisor and operational staff. The roles and responsibilities assigned to individuals are outlined in the table below and are in addition to obligations relating to workplace health and safety and other legislated roles and responsibilities.

The Construction Foreman shall ensure full compliance with the CEMP by all staff, sub-contractors and visitors.

Roles	Responsibilities	Personnel
Project Manager	Ensure all relevant approvals / permits are obtained prior to works. Ensure that relevant legislation, codes and policies are complied with. Liaising with, and reporting to the client Ensure EMP is reviewed for effectiveness and continuous improvement as required Reporting to relevant authorities Respond to internal and external audit results and implement corrective actions	TBA
Project Engineer	Ensure conditions of all approvals / permits are carried out Ensure that design is appropriate and in accordance with current legislation, standards and regulations.	TBA

	Ensure that construction works are in accordance with design drawings. Immediate notification to the Project Manager and Administrator of incidents Investigation of environmental incidents and reporting to the Project Manager Implement appropriate corrective actions to arrest or mitigate the cause of the environmental incident, near miss, complaint and non-conformance in consultation with the Project Manager and Environmental Representative	
Environmental Manager	Scheduled inspections and audits of all environmental protection measures and their efficiency. Unscheduled inspections of the site following instances of increased environmental risk (eg. heavy rainfall) or reported non-compliance. Review monitoring reports, corrective actions, incident register and complaints logs as required. Reports to Cleansight and Construction Foreman and relevant state agencies	TBA
Construction Foreman	Some reporting to relevant authorities including Council and the Principal Engineer. Ensuring project operations are performed in accordance with EMP requirements. Ensure all personnel on site have undertaken site induction. Ensuring non-compliances are reported and corrective actions are taken. Ensuring subcontractors fulfil their environmental obligations. Reviewing environmental procedures. Undertake monitoring and reporting requirements. Establish and maintain the incident register, complaints register and compliance checklists and report this information to the Project Manager.	TBA

	Direct all works for machinery and truck operators. Arranging and attending inspections and meetings. Schedule periodic meetings with operational staff to discuss and record improvement opportunities, keeping up-to-date with industry guidelines. Assigning project staff to perform WMP duties. Perform regular inspections of the site works to identify areas that require improvements	
All Staff	To undertake site works as instructed by the Site Foreman. To ensure all equipment used and works undertaken are in compliance with this EMP. To report all incidents, spills or non conformances with the EMP to the Construction Foreman. To undertake site works with a duty of care under the EP Act.	TBA

2 PRELIMINARY ENVIRONMENTAL MANAGEMENT PLAN

2.1 Vegetation Management

Purpose	To minimise the disturbance to vegetation (and its habitat values) to the greatest extent possible and prevent the spread of weeds.
Performance Objective	• Clearing kept to that absolutely required for the project and within the conditions of project environmental approvals and Councils weed management strategy. • No vegetation to be cleared outside the marked boundary of construction disturbance area. • Rehabilitation of site with endemic species at the completion of construction.
Method	*Interference with Vegetation* • Prior to any clearing or disturbance works being undertaken, all necessary permits for clearing of any native vegetation will be received from relevant regulatory authorities. • The vegetation clearing area will be clearly identified and marked on all construction plans. • All vegetation to be removed will be clearly identified as such. • All vegetation to be retained will be clearly identified as such. • Highly visible barriers (i.e. hi-viz tape or temporary fencing) will be used to establish 'no-go zones' in which marine vegetation to be retained is located. • Open earthworks will be stabilised within one week of practical completion. Revegetation works will commenced as soon as possible after construction to aid in site stabilisation. • Trees shall be cut near or at ground level and the root mass shall be retained in the ground, where possible. • Cleared native vegetation will be mulched for re-use in rehabilitation. • Impacts in root zone of retained vegetation shall be minimised. An arborist may be required to assess the tree and recommend protection measures. • Disturbed areas shall be stabilised progressively *Weed Management* • All declared and pest weed species will be removed from the construction site at initial clearing stages and also at the end of construction works. • Weed removal shall occur prior to clearing to ensure that retained topsoil and native vegetative mulch is not contaminated with weed material.

	• Any herbicides shall be used in accordance with manufacturers and DEHP guidelines. Only herbicides designed for use near waterways shall be used on site. • Remove any weeds or exotic vegetation matter that can propagate from the site. This material shall be disposed of at Council landfill sites.
Monitoring	Weekly inspections will be carried out to check: • Works are only occurring within designated area and no-go fencing is in place. • No disturbance is occurring outside designated construction zone. • Weed removal has been effective.
Reporting	• Contractor to maintain a log of inspections, maintenance actions. • Records are to be logged and kept for verification of compliance on a as need basis. • Keep records of MSDS's for pesticides and herbicides
Incidents	• Vegetation outside construction zone is cleared.
Corrective Actions	• Reinstate no-go fencing. • Survey of disturbed area to be undertaken and liaison with relevant authorities regarding permits. • Investigation into unauthorised clearing. • Re-educate personnel on importance of protecting existing marine vegetation and habitat. • Rehabilitate disturbed area.

2.2 Fauna (including bird and bat) Management

Purpose	To protect fauna and fauna habitat on the site and minimise off-site impacts
Performance Objective	• Protect existing terrestrial and aquatic fauna and habitat on the site. • Minimise impacts on adjacent fauna and habitat.
Method	• 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 • Prior to the commencement of works, the construction zone must be clearly delineated with flagging tape to identify areas to be cleared and "no-go" zones. • Any herbicides shall be used in accordance with manufacturers and DEHP's guidelines. Only herbicides designed for use near waterways shall be used on site. • Disturbed areas shall be stabilised progressively.

	• • Any permanent fencing required on site shall be fauna friendly design.
Monitoring	Weekly inspections will be carried out to check: • Pre and post operational monitoring in accordance with adaptive bird and bat management plan. • Works are only occurring within designated area and no-go fencing is in place. • No disturbance is occurring outside designated construction zone. • Temporary barriers are not causing problems with fauna or fish movements • Fauna movement through the site.
Reporting	• Contractor to maintain a log of inspections, maintenance actions. • Records are to be logged and kept for verification of compliance on an as need basis.
Incidents	• Vegetation outside construction zone is cleared. • Fauna injuries / deaths occur.
Corrective Actions	• Survey of disturbed area to be undertaken and liaison with relevant authorities regarding permits. • Investigation into unauthorised clearing of impacts on fauna. • Re-educate personnel on importance of protecting existing vegetation and habitat. • Rehabilitate disturbed area and review compensatory habitat requirements.

2.3 Water Quality and Waterways

Purpose	To ensure that impacts on water quality and the flow of water is managed in accordance with State law.
Performance Objective	• Minimise potential impacts on water quality of adjacent waterways and surface waters. • Maintain flood heights and flow paths
Method	• Ensure works are undertaken in accordance with approved plans and conditions of approval. • Install construction fencing to delineate construction zone and “no-go” areas. • Consider weather conditions prior to undertaking high-risk activities. • Cease works in storm events and ensure that erosion and sediment controls are appropriate for weather conditions. • Erosion and sediment control measures shall be implemented as per the project specific ESCP. • Acid Sulfate Soil measures shall be implemented as per the project specific ASSMP. • Storage and use of hazardous substances to be in accordance with this EMP.

	• Storage of fuel or liquid chemicals at the site to be on a bunded spill pallet to ensure no spill occurs on site. • All wastes to be securely stored and protected from rain and stormwater contact. • Treat all groundwater such that it meets water quality objectives or dispose of offsite to a licenced facility.
Monitoring	Weekly inspections will be carried out to check: • Works are only occurring within designated area and no-go fencing is in place. • Erosion and Sediment Control measures to ensure they are cleaned out and maintained in working order. • Stabilisation is occurring on a progressive basis. • For litter and debris. • For discharges from sediment basins / sediment traps.
Reporting	• Contractor to maintain a log of inspections, maintenance actions. • Records are to be logged and kept for verification of compliance on a as need basis.
Incidents	• Contamination of watercourse or stormwater drain. • Turbid water discharged from site. • Spill of fuel.
Corrective Actions	• Undertake an investigation to identify possible source of contaminants. • Take all necessary measures to prevent any further discharges of contaminants to waters.

2.4 Managing Traffic and General Environmental Nuisance

Purpose	To manage traffic and minimise the production of environmental nuisances.
Performance Objective	• No traffic complaints • No complaints about environmental nuisances. • No environmental harm to adjacent sensitive areas relating to air quality, noise or light affects
Method	*Dust, Aerosols & Emissions* Control measures may include but are not limited to: • Use of machinery in good working order; • Use water trucks to water roads and unsealed areas to limit dust emissions. • Monitor wind speed and direction and avoid or minimise dust generating activities (ie stripping, excavation, etc) during dry and windy conditions.

	• Stabilising all materials (excluding pavements and screenings) stockpiled for longer than one (1) month by grassing or another approved method. • Covering materials stockpiled for less than one (1) month with plastic, geotextile, surface binding agents, etc. *Noise* • No works shall be undertaken outside the approved hours of operation. • Loud noise generating activities shall be undertaken in an efficient manner to minimise length of noise emissions. • All plant and equipment shall be fitted with an appropriate exhaust system in accordance with manufacturers specifications. • All plant and equipment shall be maintained in sound mechanical condition. • No unnecessary idling of vehicles or plant.
Monitoring	• Regular monitoring of site activities to ensure no emissions are occurring as a result of activities. • Regular monitoring of equipment to ensure it is good working condition with appropriate exhaust system.
Incidents	• Contractor to maintain a log of inspections, maintenance actions. • Records are to be logged and kept for verification of compliance on an as need basis.
Corrective Actions	• Complaint of nuisance from site construction activities.

2.5 Soil Management

Purpose	To manage the environmental impacts associated with the exposure of soils and the use of fill material.
Performance Objective	• Erosion and Sediment Control is in accordance with Best Practice Erosion and Sediment Control (IECA, 2008). • Area of disturbance is no greater than the area necessary for construction works to occur • Minimise erosion of soils during construction works. • Minimise loss of sediment from site during construction works. • ESC measures shall be designed to achieve discharges from the construction site during rainfall events (80th percentile 5-day rainfall depth) to meet the following criteria: • pH 6.5 to 8.5. • Suspended Solids < 50mg/L and Turbidity to be calibrated. • Topsoil is stored to be used in rehabilitation works. • Any potential Acid Sulfate Soils (ASS) are managed in accordance with State Guidelines.

Method	*Erosion and Sediment Control* • Erosion and Sediment control measures are implemented as per the approved construction plans. • Install construction fencing to delineate construction zone and "no-go" areas. • Establish a single stabilised entry / exit point. • Undertake drainage control measures including: • Bypass 'clean' up-slope water around any soil disturbances. • Transport stormwater through the work site in a non-erosive manner. • Minimise hydraulic damage to the adopted erosion and sediment control measures during storm events. • Undertake erosion control measures including: • Limit the area of exposure. • Progressive stabilisation of disturbed areas with native groundcovers. • Heavy mulch to cover disturbed areas open without activity. • Where practical, undertake sediment control measures including: • High efficiency sediment (HES) basins. • Sediment fences. • If heavy rain / storms forecast stabilise exposed areas. • Stockpile topsoil for future use in rehabilitation of site. • Stockpiles of soil shall be controlled by sediment fences on the down slope side. • Water from the external catchment will be diverted around/through the site via catch drains and not allowed to enter disturbed areas of the site. • Stormwater runoff within the site shall be directed via stabilised swales to silt traps. • Disturbed areas should be progressively stabilised as quickly as possible following completion of works. • Stabilise disturbed areas with heavy mulch (50mm thick) to ensure that erosion does not occur in disturbed areas within 20 days of inactivity, even though works might continue later. • Works shall be completed as soon as practical to reduce time of exposed soils. • Excavating and placing fill must be undertaken in a way that does not interfere with the flow of water to the downstream environment. • Following completion of works the site shall be rehabilitated to stabilised any disturbed soils. *Acid Sulfate Soils* • Works that may disturb acid sulfate soils, must be undertaken in accordance with the Soil Management

	Guidelines in the Queensland Acid Sulfate Soil Technical Manual and any relevant management plan developed for the site.
Monitoring	• Contractor to undertake daily checks on weather forecasts and warnings. • Weekly inspections will be carried out to check: • Works are only occurring within designated area and no-go fencing is in place. • Erosion and Sediment Control measures to ensure they are cleaned out and maintained in working order. • Stabilisation is occurring on a progressive basis. • For litter and debris. • For discharges from sediment basins / sediment traps.
Reporting	• Contractor to maintain a log of inspections, maintenance actions. • Records are to be logged and kept for verification of compliance on a as need basis. • Records of any water quality testing to be retained for compliance. • Reports of any ASS treatment and testing results.
Incidents	• Erosion and Sediment controls are not effectively protecting the waterway. • ASS's are not appropriately managed.
Corrective Actions	• Undertake a survey of erosion and sediment control measures and determine effectiveness of current controls. • Reassess the risks of the works areas and determine if further controls will remedy any problems. • Seek the assistance of an appropriately qualified professional for advice on erosion sediment control devices. • Undertake ASS investigation to determine appropriate methods of management.

2.6 Storage and Handling of Hazardous Materials

Purpose	To prevent the contamination of water or land.
Performance Objective	• No justifiable complaints regarding inappropriate waste management resulting from construction activities received from surrounding sensitive receptors or general public. • To comply with the hazardous substances and dangerous goods storage and use requirements specified in relevant legislation, Australian Standards, MSDS and Codes of Practice
Method	• All hazardous substances and dangerous goods shall be stored, used and handled in accordance with relevant

	legislation, Australian Standards, MSDS and Codes of Practice. • Under no circumstances are hazardous materials to be placed into a roadside gutter, stormwater drain or water or a place where it can reasonably be expected to move into a roadside gutter, stormwater drain or water. • Storage and handling of potential environmental contaminants on site should occur in flat areas well away from waterways and drains. Drop sheets or drip trays (or other bunded area) should be used under mixing and pouring areas as a precaution. • Wherever possible products with low environmental toxicity should be identified and used in environmentally sensitive areas. • All staff are to be trained in the handling of hazardous substances, including fuel and spill prevention and the use of spill kits. • Store all hazardous goods a minimum of 30m away from the ocean and drainage lines and in accordance with MSDS storage requirements. MSDS for each hazardous material used on site should be available on site at all times. • Provide suitable number and size spill kits throughout the Project site and in a location available for immediate use, adjacent to sensitive environments. • All hazardous substances must be stored on a suitably sized bunded pallet or similar capable of retaining at least 120% of the volume being stored and provided with a cover for deployment prior to adverse weather conditions. • All equipment is to be well maintained, inspected frequently and free from fuel, oil, grease leaks. • Where possible select biodegradable or low risk to the environment oils, greases and hydraulic fluids. • Do not undertake any machine maintenance or refuelling within 30m of the ocean or drainage lines.
Monitoring	Weekly inspections will be carried out to check: • All machinery is in good working order and does not have any leaks • Bunded pallet is being used and fuel and hazardous substances is stored appropriately
Reporting	• Incident report to be completed for any spills, leaks or issues regarding hazardous substances or goods. • MSDS register to be stored on site.
Incidents	• Spill to ocean or stormwater drain of a hazardous substance.
Corrective Actions	• In the case of a spill of any potential environmental contaminants take immediate action to stop, contain and clean up the spill. This can be achieved through the use of a purpose built chemical or hydrocarbon spill kit or other

	absorbent material. For containment use sandbags, sand or earth bunds and floating booms for oil / fuel in waterways. • Material Safety Data Sheets give advice on suitable clean-up materials and methods. • The health and safety of staff or community members should not be compromised for the sake of spill containment or clean up. If it cannot be done safely, don't do it. • Always try and prevent the movement of a spill into environmentally sensitive areas such as waterways or wetlands as a priority.


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APPENDIX F
ASSESSMENT AGAINST STATE CODE 23, TABLE 23.2.1 (PO5, 7, 8 AND 13)

State code 23: Wind farm development

Table 23.2.1: Material change of use

Performance outcomes	Acceptable outcomes	Response
Flora and fauna		
PO5 Development ensures that impacts on flora, fauna and associated ecological processes are avoided, or minimised and mitigated, through effective siting, design and operation of the development.	No acceptable outcome is prescribed.	YES The Project is located in Tuan, Toolara and Neerdie State Forests, which are highly modified landscapes of exotic pine plantations. The Project is ideally situated as the exotic pine plantations are considered of low ecological value. The siting of the Project within the pine plantations allows areas of ecological significance to be largely avoided, which has been validated through this ecological assessment and design layout.
Stormwater management		
PO7 Development avoids, or minimises and mitigates, adverse impacts on water quality objectives to achieve no worsening to receiving waters during the operation of the wind farm.	No acceptable outcome is prescribed.	YES Some culvert upgrades may be required, which will likely improve water quality in the scoping area. Site infrastructure such as turbines are located in elevated positions away from waterways. Erosion Sediment Control plans will be prepared and implanted to manage sediment and stormwater runoff during construction and operation.
Watercourses and drainage features		
PO8 Development avoids or minimises the clearing of vegetation within any watercourse or drainage feature to protect:	No acceptable outcome is prescribed.	YES The site (i.e. project infrastructure) within the study area will aim to avoid environmentally

Performance outcomes	Acceptable outcomes	Response
1. bank stability by protecting against bank erosion 2. water quality objectives by filtering sediments, nutrients and other pollutants 3. aquatic habitat 4. terrestrial habitat.		sensitive areas (ESA) such as remnant vegetation, essential habitat and watercourses / wetlands. Whilst the study area is expansive, the disturbance footprint for the site is small. Powerlines are able to span waterways.
Construction management		
PO13 Construction activities associated with the development avoid, or minimise and mitigate, adverse impacts on environmental values, water quality objectives, amenity, local transport networks and road infrastructure.	No acceptable outcome is prescribed.	YES. Turbines are in exotic pine plantations off existing access tracks. Construction activities will be undertaken in accordance with the EMP and other specific management plans.

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