

Appendix G Fauna Management Plan



ecosure
improving ecosystems

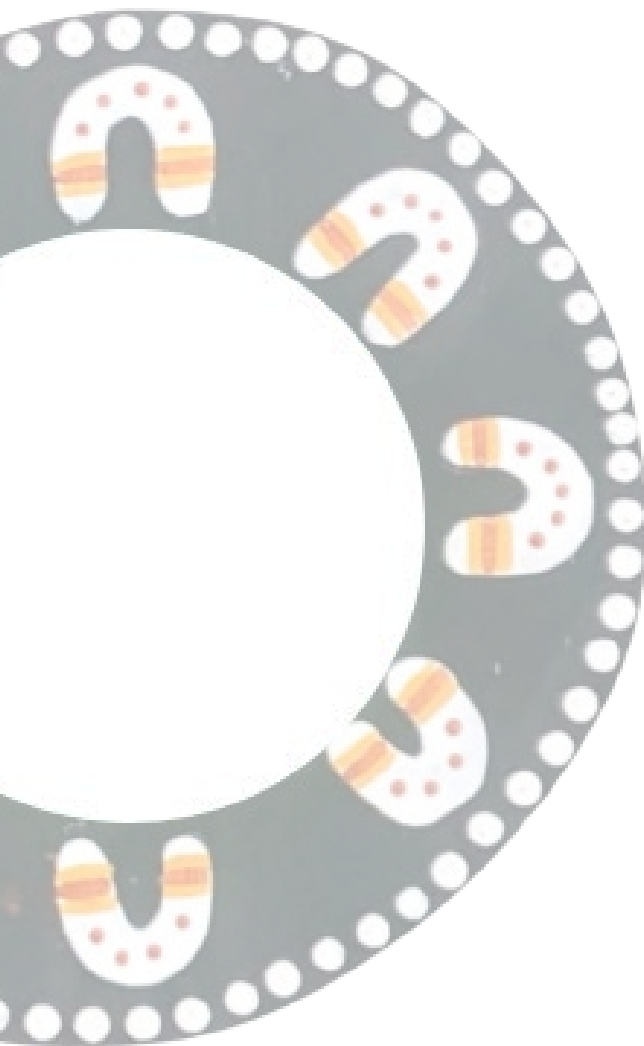
**FAUNA MANAGEMENT PLAN
TARONG WEST WIND FARM,
IRONPOT QUEENSLAND**

August 2025

TARONG WEST PROJECT CO PTY LTD

Acknowledgement of Country

Ecosure acknowledge the Traditional Custodians of the lands and waters where we work. We pay deep respect to Elders past and present who hold the Songlines and Dreaming of this Country. We honour and support the continuation of educational, cultural and spiritual customs of First Nations peoples.



Acknowledgements

Ecosure would like to acknowledge the project team that has collaboratively contributed knowledge over the course of the project to produce this Preliminary Fauna Management Plan, including staff from icubed Consulting Pty Ltd, AECOM Australia Pty Ltd and RES Australia Pty Ltd.

Declaration of accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name (please print)

Organisation (please print)

Date

Glossary, acronyms and abbreviations

BBMP	Bird and Bat Management Plan
BoM	Bureau of Meteorology
Conservation significant species	Species listed as threatened (critically endangered, endangered, vulnerable) and/or migratory under EPBC Act or threatened (critically endangered, endangered, vulnerable) and/or near-threatened under the NC Act
DAWE	Commonwealth Department of Agriculture, Water and the Environment (now DCCEEW)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water (previously DAWE)
DETSI	Queensland Department of Environment, Tourism, Science and Innovation
DoE	Commonwealth Department of the Environment (now DCCEEW)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
FMP	Fauna Management Plan
FSC	Fauna spotter catcher
HVR	High value regrowth
kV	Kilovolt
MNES	Matters of national environmental significance
MSES	Matters of state environmental significance
NC Act	<i>Nature Conservation Act 1992</i> (Queensland)
RE	Regional ecosystem
SARA	State Assessment Referral Agency
SEVT	Semi-evergreen vine thicket
SLC	Special least concern species under the NC Act
SMP	Species Management Program
Threatened	critically endangered, endangered, or vulnerable
WTG	Wind turbine generator

Contents

Acknowledgement of Country	ii
Acknowledgements	iii
Declaration of accuracy	iv
Glossary, acronyms and abbreviations	v
List of figures	viii
List of tables	viii
1 Introduction	1
1.1 Background	1
1.2 Proposed development	1
1.3 Aims and Objectives	3
1.4 Document context	3
1.5 Report conventions	4
1.6 Legislative content	5
2 Existing environment	13
2.1 Landscape values and climate	13
2.2 Vegetation and habitats	14
2.3 Fauna species	17
2.4 Threatened fauna habitat	17
2.5 Other conservation significant species	18
3 Proposed impacts and mitigation	20
3.1 Impacts on fauna and fauna habitat	20
3.1.1 Proposed impacts on threatened fauna habitats	20
3.1.2 Impacts on other significant fauna habitats	23
3.2 Avoidance, minimisation and mitigation measures	23
3.2.1 Avoidance of impacts	24
3.2.2 Minimisation of impacts	24
3.2.3 Mitigation of impacts	26
4 Fauna management	28
4.1 Applicable legislation	28
4.2 Timing of clearing	28
4.3 Management approach prior to clearing	29
4.3.1 Targeted field surveys	29
4.3.2 Pre-clear surveys	29
4.4 Management approach during clearing	30
4.4.1 Hollow-bearing trees	31
4.4.2 Relocation of fauna	31
4.5 Management approach during construction	32
4.6 Management approach during operation	33
4.7 Threatened and conservation significant species management	33

4.7.1	Koala	33
4.7.2	Greater glider.....	34
4.7.3	Grey-headed flying-fox.....	35
4.7.4	White-throated needletail	35
4.7.5	Glossy black-cockatoo	36
4.7.6	Short-beaked echidna.....	36
4.7.7	Fork-tailed swift.....	36
4.7.8	SMPs	36
4.8	Pest animal management	37
4.9	Treatment / removal of injured fauna.....	37
5	Risk assessment.....	38
6	Roles and responsibilities	42
6.1	Personnel and responsibilities.....	42
6.2	Training.....	42
6.3	Monitoring and reporting	43
7	Performance outcomes, corrective actions, and triggers for review.....	44
7.1	Performance outcomes	44
7.2	Corrective actions	44
7.3	Contingency planning	45
	References	47
Appendix 1	Species profiles.....	50

List of figures

Figure 1 Project site location	10
Figure 2 Proposed developmental layout and proposed clearing footprint.....	11
Figure 3 Field verified fauna habitat	16

List of tables

Table 1 Statutory legislation applicable to the FMP	5
Table 2 Fauna habitats recorded within the site	14
Table 3 Results of surveys for EPBC Act and/or NC Act listed fauna species	17
Table 4 Results of surveys for other conservation significant fauna species	19
Table 5 Maximum proposed clearing for project infrastructure on threatened fauna habitat	22
Table 6 Maximum proposed clearing for project infrastructure on other significant fauna habitat.....	23
Table 7 Potential impacts to ecological values and recommended avoidance, minimisation and mitigation measures	26
Table 8 Likelihood evaluation criteria	38
Table 9 Consequence evaluation criteria	38
Table 10 Risk rating matrix for impacts to fauna.....	39
Table 11 Potential impacts to fauna, measures to mitigate these impacts and residual risk rating of impacts assuming effective implementation of mitigation measures	40
Table 12 Performance outcomes	44
Table 13 Corrective actions in the case of adverse events.....	45

1 Introduction

1.1 Background

This Fauna Management Plan (FMP) has been produced for Tarong West Project Co Pty Ltd (the proponent) to support a development application for the proposed Tarong West Wind Farm site (herein referred to as the project site). This FMP addresses the requirements of the State Development Assessment Provisions (SDAP) version 3.0 and Performance Outcome 5 of State Code 23: Wind farm development, as they relate to fauna. The project requires approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for assessment of environmental impacts to matters of national environmental significance (MNES; EPBC 2023/09643). A Public Environment Report (PER) is required to assess impacts. A FMP is required to accompany the PER and the planning application. The project is also the subject of a Development Approval from the State Assessment and Referral Agency (SARA) dated 25 July).

The intention of this FMP is to provide avoidance, minimisation and mitigation measures to protect fauna from adverse impacts resulting from the proposed development. The FMP incorporates information identified from desktop and field assessments (Ecosure 2023a, b, c and 2024a). This information includes an assessment of onsite habitat values, records of fauna presently using or likely to use the project site, potential impacts to fauna and strategies to mitigate fauna injury/impacts.

1.2 Proposed development

The proposed development is the construction and operation of a wind farm located at Ironpot, near Kingaroy in south east Queensland (Figure 1). The wind farm will have up to 97 wind turbine generators (WTG) connected by access tracks and supported by other infrastructure. The development and construction of the site will involve significant ground disturbing work and will include the construction of the following key components:

- up to 97 WTGs
- wind turbine foundations and hardstand areas
- three permanent and four temporary (during construction period only) meteorological masts
- internal electrical reticulation consisting of overhead lines and underground cabling
- access tracks including widening sections of Ironpot Road
- planning corridor containing a maximum clearing footprint of 871.87 ha. The planning corridor allows scope to allow for minor micro-sitting of project infrastructure within the clearing footprint
- on-site connection to existing 275 kilovolt (kV) transmission line
- electrical substations to facilitate connection of the project to the grid

- construction compounds and laydown areas
- site compounds
- operations and maintenance facilities
- batching plant
- borrow pits
- washdown areas
- helipad.

Figure 2 shows the proposed planning corridor and clearing footprint to accommodate WTGs, access tracks and other associated infrastructure. The clearing footprint represents the maximum proposed clearing area (as provided by the proponent in October 2024) and has been reduced by ongoing refinement during the detailed design phase. Potential for micro-siting of infrastructure will provide further opportunity to refine the clearing area. In the planning corridor presented in this plan, no WTGs or hardstands are proposed to be placed in ecologically significant areas (e.g. areas of remnant vegetation).

The project is currently planned to be constructed in a single stage, with construction proposed to start in the second quarter of 2025 and last approximately 30 months.

Construction

The construction methodology will generally include:

- marking out areas for infrastructure installation
- clearing the areas of vegetation
- scraping off the topsoil and stockpiling for later use in rehabilitation
- construction of access tracks
- widening sections of Ironpot Road to allow transport of turbine components
- creating a level pad for infrastructure construction
- installing the infrastructure
- rehabilitating disturbed surfaces that are not required for operations.

Operation

The project is expected to have an operational life of at least 30 years excluding construction and decommissioning. The operational parameters of the project have not been finalised at this stage. However, it has been assumed that all WTGs will be operating continuously when wind speeds are suitable, apart from occasional shut-down periods for maintenance.

Decommissioning

Decommissioning or repowering of the site is expected to occur at the end of the project's useful life. If decommissioning occurs, the process is expected to take approximately 24

months and be undertaken in accordance with all relevant approval conditions and best practice methods at the time of decommissioning. If repowering occurs it will be undertaken in accordance with all relevant approval conditions and any changes to the Project design or configuration will be submitted for assessment by all relevant regulatory bodies, as required.

1.3 Aims and Objectives

The aim of this FMP is to avoid, minimise and mitigate the potential impacts to native fauna and their habitats during construction and operation of the project.

The objectives of the FMP to support this aim are:

- mitigate and manage the risk (of injury or mortality) to fauna during construction and operation of the wind farm
- outline measures that will result in the humane and ethical treatment of animals during construction and operation of the wind farm
- mitigate and manage potential impacts of clearing works, gross mechanical disturbance, invasive species or impacts associated with sedimentation or escape of pollutants from the construction area on retained habitat and habitat features
- allow continued utilisation of the site by fauna, post construction.

Direct and indirect impacts to flying terrestrial fauna (birds and bats) include both impacts during construction (primarily habitat loss from clearing) and impacts during operation (primarily wind turbine strike). Impacts to birds and bats from vegetation clearing and construction activities are considered as part of this FMP. Impacts to birds and bats from operation of the project are considered and managed separately in the Bird and Bat Management Plan (BBMP) (Ecosure 2024b).

1.4 Document context

This FMP is supported by, and must be read in conjunction with, the following documents:

- Ecological Assessment Report for Tarong West Wind Farm (Ecosure 2023a)
- Tarong West Wind Farm Transport Route Ecological Assessment (Ecosure 2023b)
- Assessment of Matters of National Environmental Significance for Tarong West Wind Farm, Ironpot, Queensland (2023c)
- Addendum to the Assessment of Matters of National Environmental Significance for Tarong West Wind Farm (Ecosure 2024a)
- Bird and Bat Management Plan for Tarong West Wind Farm (Ecosure 2024b)
- Vegetation Management Plan for Tarong West Wind Farm (Ecosure 2024c)
- Bird and Bat Utilisation Survey for Tarong West Wind Farm (Ecosure 2024d).

Information provided in the FMP includes:

- background (including existing site conditions)
- habitat values
- fauna register
- wildlife management measures including
 - pre-clearance requirements
 - general requirements
 - special considerations for known conservation significant species
- responsible authorities
- species profiles.

1.5 Report conventions

The following conventions are used throughout the report:

- The project site comprises the properties identified in Figure 1.
- The project boundary defines the outer perimeter of the project site.
- The proposed development comprises the spatial data presented in the shapefiles provided by the proponent in October 2024.
- The planning corridor is the area for all infrastructure and development to occur within the project site and contains the clearing footprint (Figure 2).
- The clearing footprint represents the maximum disturbance footprint of the project, while allowing for minor micro-siting within the planning corridor.
- Conservation significant species include flora and fauna species that are listed as
 - threatened (critically endangered, endangered or vulnerable) and/or migratory under the EPBC Act
 - threatened (critically endangered, endangered or vulnerable) or near threatened flora and fauna species and special least concern (SLC) fauna species under the *Nature Conservation Act 1992* (NC Act).
- Common and scientific names of flora and fauna species follow the Department of Environment, Tourism, Science and Innovation (DETSI) WildNet database (DETSI 2024).
- Introduced species are denoted by an asterisk (*).

1.6 Legislative content

Table 1 outlines statutory legislation that is relevant to:

- identifying the fauna values likely to be present on the project site
- providing guidance for the assessment of potential project impacts
- avoiding, minimising and mitigating impacts of project activities.

Table 1 Statutory legislation applicable to the FMP

Jurisdiction	Legislation / Guideline	Brief description
Commonwealth	EPBC Act Significant Impact Guidelines 1.1 - Matters of National Environmental Significance	<p>The EPBC Act provides the legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places identified as MNES. MNES are defined in the EPBC Act and include:</p> <ul style="list-style-type: none"> • Ramsar wetlands of international importance • World Heritage properties • National Heritage places • Commonwealth Marine areas • the Great Barrier Reef Marine Park • nationally listed threatened species and ecological communities • nationally listed migratory species • nuclear actions (including uranium mining) • water resources in relation to coal seam gas and large coal mining development. <p>A project or action which is likely to have a significant impact on a MNES is a 'controlled action' and must be submitted to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for assessment and determination by the Minister. The EPBC Act processes allow voluntary referral of a project to seek confirmation as to whether a significant impact on MNES is likely and to confirm any approval pathway.</p> <p>The Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (Department of the Environment [DoE] 2013) were released to assist proponents with the assessment of the significance of impacts on MNES and are relevant to fauna and fauna habitat at the project site.</p> <p>This project was determined to be a controlled action to be assessed using a PER based on impacts to threatened species and communities present in the project site.</p>

Jurisdiction	Legislation / Guideline	Brief description
State	<i>Planning Act 2016</i>	<p>The <i>Planning Act 2016</i> establishes the framework for the Queensland planning system. The purpose of the legislation is to establish an efficient and accountable system of land-use planning and development assessment that will lead to ecological sustainability. The Act defines ecological sustainability as a balance between:</p> <ul style="list-style-type: none"> the protection of ecological processes and natural systems at local, regional, state and national levels economic development the cultural, economic, physical and social wellbeing of Queenslanders. <p>The Planning Regulation (2017) and the State Planning Policy (2017) guide local and state government in land use planning and development by defining the Queensland Government policies relating to matters of State interest.</p> <p>Applications for development approval are lodged with either the local council or the State Assessment Referral Agency (SARA), depending on the nature of the proposed development, the zoning of the land and the location. The SARA provides expert assessment of specific aspects of the proposed development and can be either the assessment manager (determining the application) or a referral agency.</p> <p>This FMP along with an accompanying Ecological Assessment (Ecosure 2023a), supported the assessment process for the development application. Condition 12 of the approval requires finalisation of a Vegetation and Fauna Management Plan prior to the commencement of vegetation clearing and implementation all measures at all times during the clearing of vegetation. This plan specifically focuses on the fauna management measures of the required Vegetation and Fauna Management Plan.</p>
State	<p>SDAP</p> <p>State code 23: Wind farm development</p> <p>State code 23: Wind farm development – Planning guideline</p>	<p>Development Application 2402-39136 SDA for a Material change of use for a wind farm (97 wind turbine generators and ancillary infrastructure) and Operational work for clearing native vegetation was approved by SARA on 25 July 2024.</p> <p>The SDAP provide assessment benchmarks and consistency in assessment and contain state codes which are specific to particular development proposals or impacts. Each code includes a purpose and performance outcomes. Some include acceptable outcomes which identify one way to achieve the relevant performance outcome.</p> <p>State code 23: Wind farm development. Performance was addressed as part of the development application, including outcome PO5 of the code which requires that “<i>wind farm development is designed, sited and operated to ensure that flora, fauna and associated ecological processes are protected from adverse impacts</i>”.</p> <p>The following information was provided with the development application, as specified in the Guidelines accompanying the state code, to demonstrate that a proposal is consistent with Performance Outcome 5:</p> <ul style="list-style-type: none"> an Ecological Assessment (Ecosure 2023a) a Preliminary FMP (Ecosure 2023d) a Preliminary Vegetation Management Plan (Ecosure 2023e) a Preliminary BBMP (Ecosure 2023f). <p>No further assessment against the State Code is required and a final FMP is to be provided for approval in accordance with the development permit.</p>

Jurisdiction	Legislation / Guideline	Brief description
State	<p>NC Act</p> <p>Nature Conservation (Animal) Regulation 2020</p>	<p>The NC Act aims to conserve nature through strategies such as dedicating and declaring protected areas for those parts of Queensland with outstanding biological diversity, natural features and wilderness values. The NC Act provides for the conservation of native fauna through restriction of activities such as taking, keeping or interfering with animals or their breeding places. The act also contains provisions relating to the management of non-native wildlife.</p> <p>Unless authorised, it is an offence under the NC Act to take, keep, use, or move protected animals for commercial, recreational or other purposes. Protected animal is defined as an animal that is prescribed under this Act as threatened, near threatened or least concern wildlife. Where a proposed development will result in such impacts to fauna protected under the NC Act, authorisation from the DETSI will be required.</p> <p>Nature Conservation (Animal) Regulation 2020</p> <p>In support of the purpose and the provisions of the NC Act, this regulation identifies all native fauna species as either 'extinct in the wild', 'endangered', 'vulnerable', 'near threatened' and 'least concern' which includes SLC wildlife. SLC wildlife includes short-beaked echidna (<i>Tachyglossus aculeatus</i>), platypus (<i>Ornithorhynchus anatinus</i>) and migratory birds listed under international conservation agreements with Japan, Korea or China or the Bonn Convention.</p> <p>Under s335 Tampering with animal breeding place, a person must not, without a reasonable excuse, tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring. A high-risk Species Management Program (SMP) is required for near threatened, vulnerable, endangered, critically endangered, SLC species and colonial breeders (bats, some wetland bird species). A low-risk SMP is required for other least concern species. Note that due to the mobility of koala (with young in the pouch), this species is excluded from this requirement (DES 2020).</p> <p>The Ecological Assessment (Ecosure 2023a) details the threatened fauna species listed under the NC Act confirmed or likely to occur within the project site.</p>
State	Vegetation Management Act 1999 (VM Act)	<p>The VM Act is the planning initiative underlying regional management of vegetation in Queensland. The VM Act aims to conserve remnant endangered and of concern regional ecosystems (REs), prevent land degradation and further loss of biodiversity, manage the environmental impacts of clearing vegetation and reduce of greenhouse emissions.</p> <p>In addition to provisions related to the protection and management of native vegetation and regrowth, the VM Act contains provisions for the regulation of essential habitat for species of state significance. Essential habitat (mapped by DES) is vegetation in which a species listed as endangered or vulnerable under the NC Act has been known to occur. Clearing or disturbance to areas of essential habitat will require compensatory habitat measures to be developed.</p> <p>The Ecological Assessment (Ecosure 2023a) details the regulated vegetation, REs and essential habitat ground truthed as fauna habitat present across the project site.</p>

Jurisdiction	Legislation / Guideline	Brief description
State	<i>Biosecurity Act 2014</i>	<p>The <i>Biosecurity Act 2014</i> is administered by the Department of Agriculture and Fisheries. The Act provides management measures to protect agricultural and tourism industries and the environment from pests, diseases and contaminants. Under the Act, invasive plants and animals are categorised as either a 'Prohibited Matter' or a 'Restricted Matter'.</p> <p>Land owners and proponents have obligations under this act to manage pest species. In the context of this FMP this includes identification of potential threats and the provision of measures to avoid or manage the spread and impacts of prohibited or restricted matters.</p> <p>The Ecological Assessment (Ecosure 2023a) details the fauna biosecurity matters ground truthed on the project site.</p>
State	<i>Environmental Protection Act 1994</i>	<p>The <i>Environmental Protection Act 1994</i> (EP Act) provides the key legislative framework for environmental management and protection in Queensland.</p> <p>The EP Act utilises a number of mechanisms to achieve its objectives. Relevant to this project is the requirement for the establishment of a general environmental duty, under Section 319 of the EP Act.</p> <p>Section 319 of the EP Act places a general environmental duty on Tarong West Wind Farm to ensure that 'it does not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm'.</p> <p>By undertaking the preparation of this detailed ecological investigation, Tarong West Wind Farm demonstrates that it is cognisant of the responsibilities for environmental protection and management in Queensland.</p> <p>Wind farms are not environmentally relevant activities for the purposes of this act.</p>

Jurisdiction	Legislation / Guideline	Brief description
State	<i>Water Act 2000</i>	<p>The purpose of the <i>Water Act 2000</i> is to provide for the sustainable management of water and other resources. Under Section 266 of the <i>Water Act 2000</i>, a riverine protection permit is generally required from the Department of Resources to:</p> <ul style="list-style-type: none"> · destroy vegetation in a watercourse · excavate in a watercourse · place fill in a watercourse. <p>Additionally, water supply for construction purposes (e.g. access track construction/ compaction, dust suppression etc) may be required. Where this water supply is proposed to be sourced from nearby watercourses, a permit in accordance with Section 237 of the <i>Water Act 2000</i> will be required from the Department of Resources prior to any water being extracted from the watercourse.</p> <p>The Ecological Assessment (Ecosure 2023a) details relevant water resources (watercourses and drainage lines) present within the project site.</p>
State	Environmental Offsets Regulation 2014	<p>Matters of State Environmental Significance (MSES) are referenced in the biodiversity State interest under the State Planning Policy 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.</p> <p>Many of the MSES in the Environmental Offsets Regulation 2014 coincide with the MSES listed under the State Planning Policy, however, there are additional items listed under the Environmental Offsets Regulation 2014 that are not listed in the State Planning Policy. 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.</p> <p>The Ecological Assessment (Ecosure 2023a) details the MSES within the project site and the potential development impacts to MSES that may require offsets.</p>

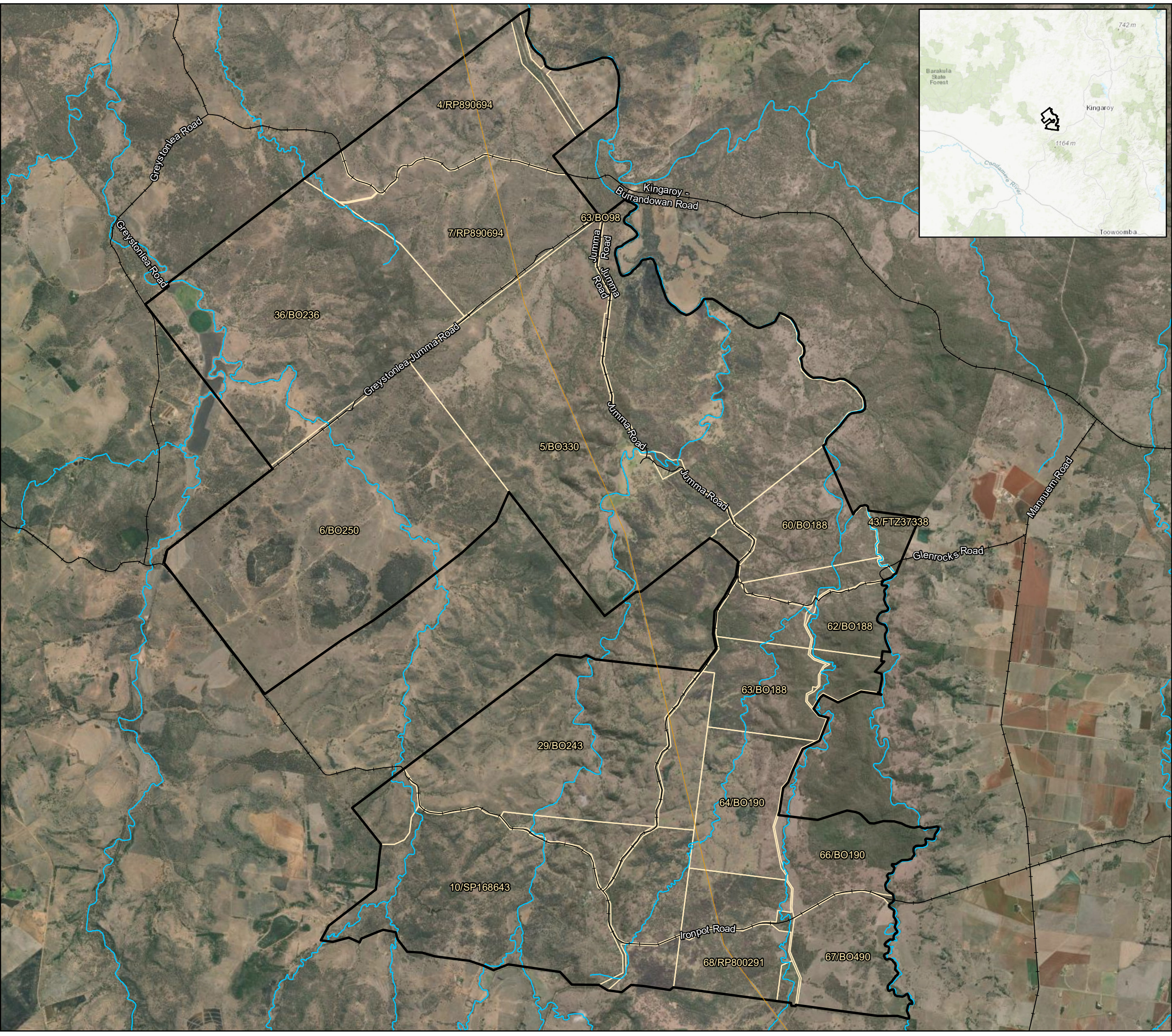


Figure 1: Project site location

- Legend**
- Existing 275kV transmission line
 - Road
 - Watercourse
 - Project boundary
 - Land parcel


Tarong West Project Co Pty Ltd

Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland

0 1 2 4
Kilometers

Job number: PR6944
Revision: 0
Author: KF
Date: 11/27/2024

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

 **ecosure**
improving ecosystems

Data Sources: © Ecosure Pty Ltd 2024; Image Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

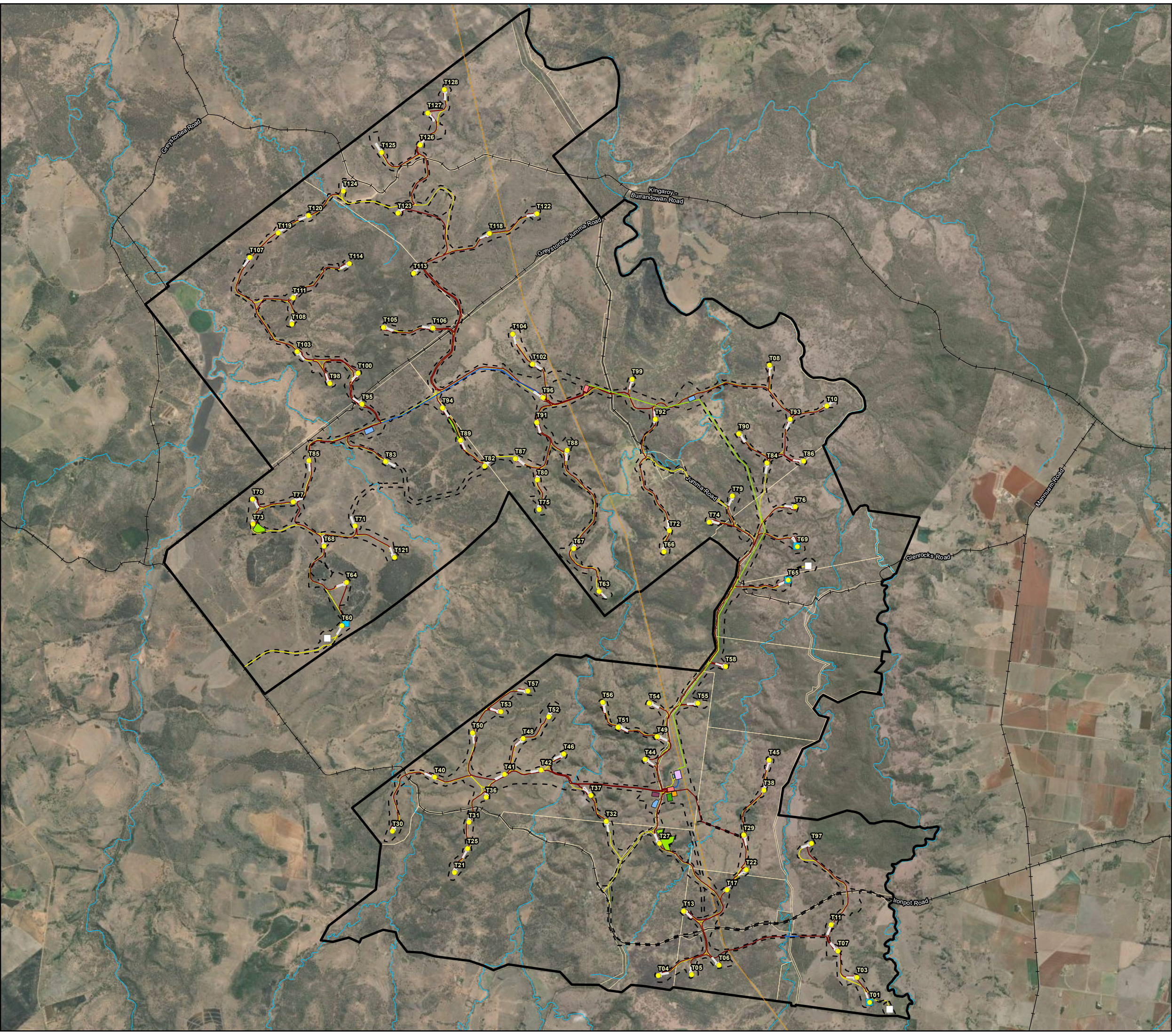


Figure 2a: Proposed development layout

Legend

●

 WTG

□

 Mast (permanent)

■

 Mast (temporary)

—

 Turbine hardstand

—

 Cables - overhead 275kV

—

 Cables - overhead 33kV

—

 Cables - underground

—

 Existing 275kV transmission line

—

 Access track

—

 Watercourse

—

 Road

■

 Batch plant

■

 Borrow pit

■

 Helipad

■

 Laydown

■

 Operations and maintenance building

■

 Site compound

■

 Substation

■

 Switching station

- - -

 Planning corridor

▭

 Project boundary

▭

 Land parcel

Tarong West Project Co Pty Ltd

Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland

0

1

2

4

Kilometers

Job number: PR6944

Revision: 0

Author: KF


Date: 11/27/2024

GDA 1994 MGA Zone 56

Projection: Transverse Mercator

Datum: GDA 1994

Units: Meter



ecosure

improving ecosystems

Data Sources: © Ecosure Pty Ltd 2024; Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

ECOSURE does not warrant the accuracy or completeness of information displayed in this map. Any person using this map does so at their own risk, and should consider the context of the report that this map supports. ECOSURE shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

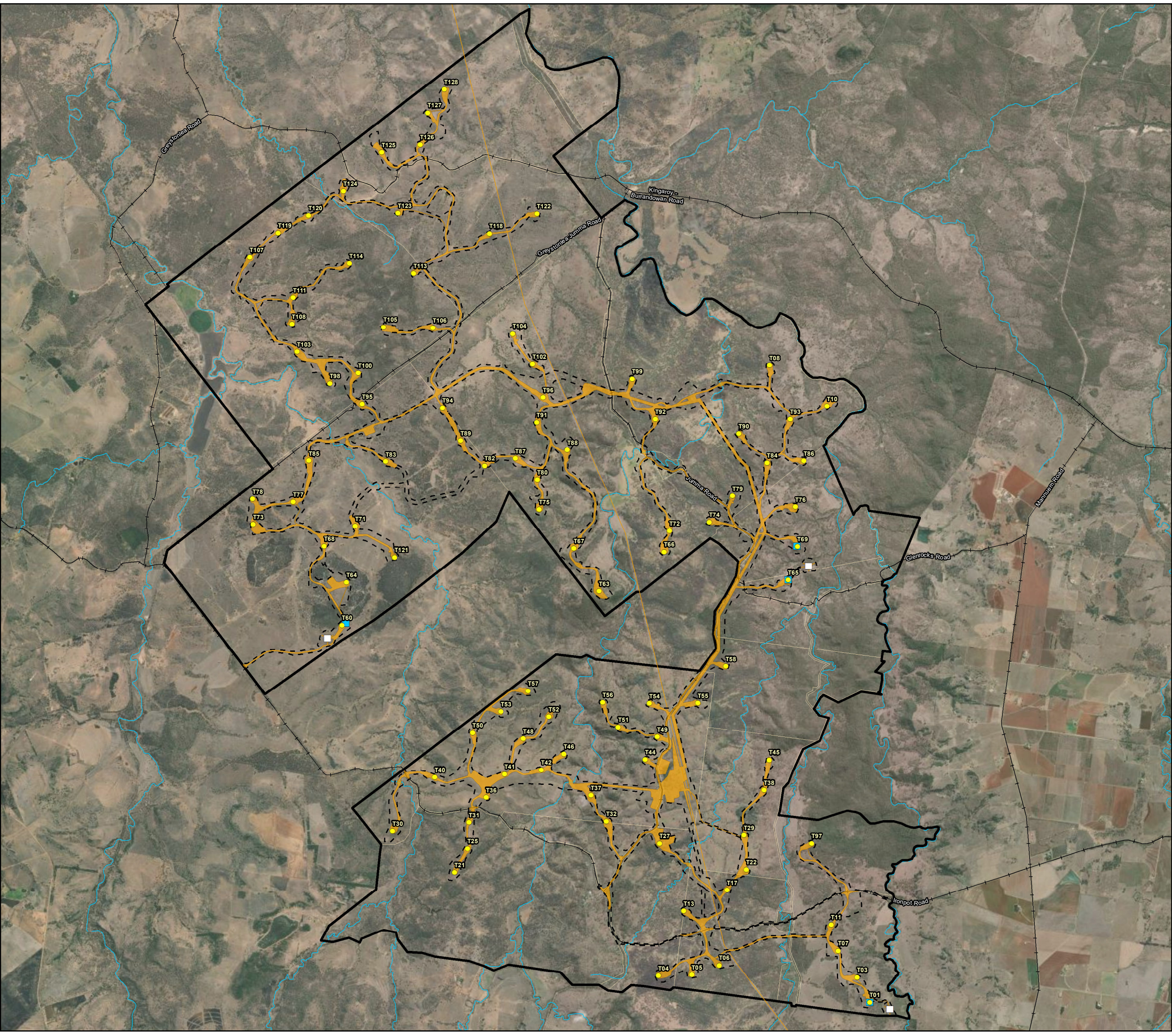


Figure 2b: Proposed clearing footprint

- Legend**
- WTG
 - Mast (permanent)
 - Mast (temporary)
 - Existing 275kV transmission line
 - Watercourse
 - Road
 - Clearing footprint
 - Planning corridor
 - Project boundary
 - Land parcel

RES Australia

Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland

0 1 2 4
Kilometers

Job number: PR6944
Revision: 0
Author: KF
Date: 11/27/2024

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



Data Sources: © Ecosure Pty Ltd 2024; Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
ECOSURE does not warrant the accuracy or completeness of information displayed in this map. Any person using this map does so at their own risk, and should consider the context of the report that this map supports. ECOSURE shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

2 Existing environment

2.1 Landscape values and climate

The project site covers an area of approximately 17,500 ha within the South Burnett Regional Council area and lies approximately 30 km west of Kingaroy and approximately 85 km east of Chinchilla. It is currently used for cattle grazing with areas of cleared paddocks and standing vegetation. Access to the site is via Ironpot Road (Figure 1).

The site is located approximately 20 km to the north of the Bunya Mountains National Park, 7 km to the east of Diamondy State Forest and 7 km to the south of Dangore State Forest. It lies to the north, but outside, of a mapped state significant biodiversity corridor (DES 2018) and regionally significant corridors are mapped along the Boyne River and Jumma Creek.

The site is located on the south eastern boundary of the Brigalow Belt (South) bioregion in the Banana-Auburn Ranges subregion. Landforms present are primarily undulating plains and hillslopes. The project site occurs within a highly fragmented area with remnant and high value regrowth (HVR) vegetation occurring within generally small and discontinuous patches. Within the site, large patches occur along the ranges on the eastern boundary, which extends to vegetation to the north-east of the site and eventually connects to Dangore State Forest to the north. A large patch of vegetation in the western portion connects via vegetation near Kingaroy-Burrandowan Road to Diamondy State Forest to the west. Linear strips of vegetation provide some connectivity along Kingaroy-Burrandowan Road along the northern boundary of the project site. Riparian vegetation along larger watercourses (e.g. Boyne River, Jumma Creek, Middle Creek) provide some connectivity along the lower portions of the project site.

Natural wetlands do not occur within the site and there are no significant wetlands in close proximity to the site (Ecosure 2023a). There are, however, temporary wetlands to the north and north-west of site, including one palustrine wetland (Ecosure 2023a). Landholders have also constructed numerous farm dams throughout the site. These dams may provide habitat for wetland birds and waterfowl and a water source for other fauna.

The project site occurs within the Boyne-Auburn Rivers drainage sub-basin in the Burnett drainage basin, which drains to the Great Barrier Reef lagoon. One major mapped watercourse flows generally south to north within the site. The Boyne River begins as a second order stream in the south of the site, increasing in size before exiting the site along the north-western boundary. The Boyne River feeds into Boondooma Lake and the Burnett River before discharging at Bargara near Bundaberg. Other large streams that flow into Boyne River, either within or north of the site, include Mannuem Creek on the eastern boundary, Middle Creek in the south-eastern portion, Jumma Creek in the central portion, Boughyard Creek in the western portion and Ironpot Creek in the north-western portion of the site.

The climate is defined as sub-tropical with warm, humid summers and cool, dry winters. The nearest Bureau of Meteorology (BoM) weather station at Kingaroy Airport (Station 040922], approximately 30 km east of the site, has an average maximum temperature of 19.6°C in July and 30.9°C in January (BoM 2023). The average annual rainfall is 663.3 mm (BoM 2023).

2.2 Vegetation and habitats

The vegetation within the site is relatively homogenous comprising narrow bands of riparian vegetation along larger watercourses and dry sclerophyll forests and woodlands dominated by lemon-scented gum (*Corymbia citriodora*) and narrow-leaved ironbark (*Eucalyptus crebra*) on ridges and slopes. One small patch of semi-evergreen vine thicket (SEVT) occurs in the south-western corner.

Non-remnant vegetation covers most of the site (15,838.54 ha or 90.52% of the site). Field-verified remnant vegetation occurs within 1,336.34 ha (7.63%) of the site and HVR within 321.35 ha (1.84%). The ground layer is sparse to dense and is dominated by grasses, including native species (e.g. *Cymbopogon refractus*, *Aristida queenslandica*, *Bothriochloa decipiens*, *Entolasia stricta*, *Imperata cylindrica*) and exotic species (e.g. *Cynodon dactylon*, *Eragrostis curvula*, *Melinis repens*, *Megathyrus maximus*). A variety of native and exotic forbs are common in non-remnant areas. Tree cover is variable.

Five broad habitat types were recorded across the site (Table 2, Figure 3).

Table 2 Fauna habitats recorded within the site

Habitat type	Component REs	Habitat description	Potential fauna habitat	Area (ha)
Eucalypt woodland/forest	11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3, 11.12.6	Sparse to mid-dense canopy of trees. Shrub layer absent to mid-dense. Ground layer sparse to mid-dense and dominated by grasses and forbs. Numerous small hollows and occasional large hollows.	<ul style="list-style-type: none"> · reptiles · arboreal and ground dwelling mammals · birds 	1,633.81 ha (9.3%)
Riparian forest	11.3.25	Sparse to mid-dense canopy of trees. Shrub layer absent to mid-dense. Ground layer sparse to dense with diverse range of grasses, forbs, sedges and rushes. Numerous small hollows and occasional large hollows.	<ul style="list-style-type: none"> · arboreal fauna · reptiles · ground dwelling mammals · birds 	941.58 ha mapped (5.38%) 23.25 ha ground-truthed remnant (0.13%)
Vine thicket	11.8.3, patches of RE 11.12.6 with developing vine thicket mid storey	Scattered emergent trees over sparse to dense canopy containing a diverse variety of vine thicket tree species. Shrub layer absent to mid-dense. Ground layer very sparse to sparse (may be denser in patches with reduced tree cover), numerous vines. Numerous small hollows and occasional large hollows in emergent eucalypts.	<ul style="list-style-type: none"> · reptiles · ground dwelling mammals · birds 	0.63 ha (0.004%)
Pasture / exotic grassland	Non-remnant	Isolated trees and shrubs. Ground layer sparse to dense and dominated by grasses and forbs. Rare hollows in large remnant paddock trees.	<ul style="list-style-type: none"> · reptiles · small mammals 	15,838.54 ha (90.52%)

Habitat type	Component REs	Habitat description	Potential fauna habitat	Area (ha)
Farm dam	Non-remnant	Banks have scattered trees and shrubs. Ground layer varies from bare dirt to dense layer of grasses, forbs and sedges. Shallow water may support sparse to dense aquatic plants including forbs, sedges and rushes. Deeper water generally open with scattered lilies or floating aquatic plants. Occasional hollows in large remnant paddock trees.	<ul style="list-style-type: none"> · amphibians · wetland birds 	Scattered throughout site.

Remnant eucalypt woodland/forest is the main remnant fauna habitat within the site. It is generally dominated by *Eucalyptus crebra* or *Corymbia citriodora*. Mature individuals of these species typically contain numerous small hollows suitable for nesting or denning by small arboreal fauna and occasional large hollows suitable for larger arboreal mammals and large birds. These species also provide important seasonal nectar resources for birds and bats. Some small areas have rock outcrops (e.g. granite, metamorphic, conglomerate and laterite outcrops) that provide shelter and habitat for fauna such as reptiles and small mammals.

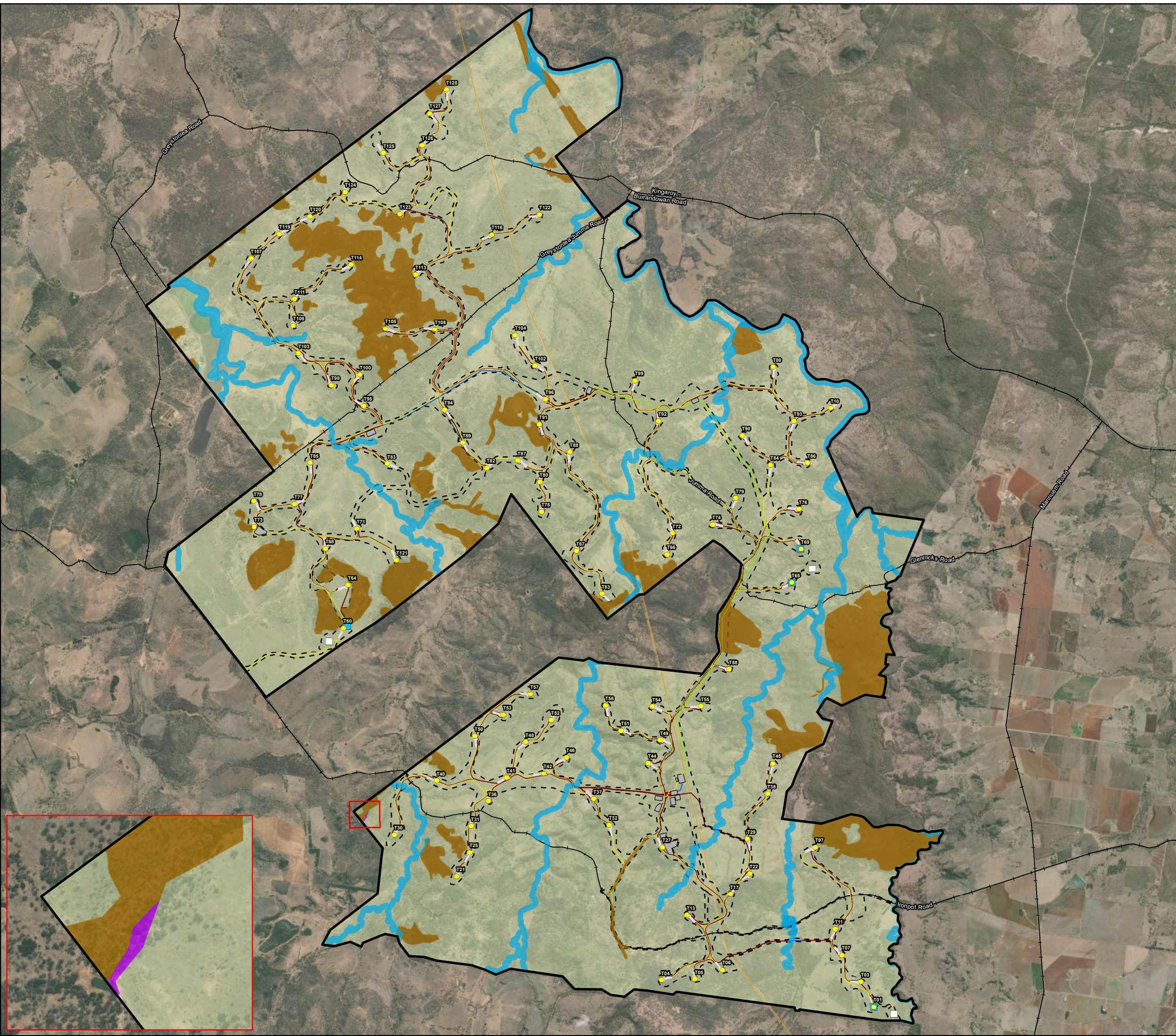
Riparian forest occurs on riparian soils along major watercourses. These areas provide a sparse to mid-dense canopy of trees usually containing scattered large and numerous small hollows, providing nesting and denning habitat for arboreal fauna, including greater gliders. Trees also provide important seasonal nectar resources. Scattered pools provide drinking and bathing water for numerous species and riparian areas can be valuable refuges during droughts and provide important corridors for wildlife travelling between remnant habitat blocks.

Vine thicket has a sparse to dense canopy of trees and shrubs that provide shelter as well as important seasonal fruit and nectar resources. The shrub layer is often mid-dense to dense, providing cover for reptiles and ground dwelling mammals and birds. Leaf litter, logs and rocks provide shelter and foraging habitat for small fauna such as reptiles and small mammals.

Cleared grassland is the main habitat type, by area, across the project site. Isolated trees provide limited food, roosting and nesting/denning resources. The sparse to dense grassy ground layer provides shelter and food resources for suitable species.

Farm dams are scattered throughout the site and provide drinking and bathing water and dense fringing vegetation on some dams provide shelter and food resources for small animals such as wetland birds.

Figure 3: Field-verified fauna habitat

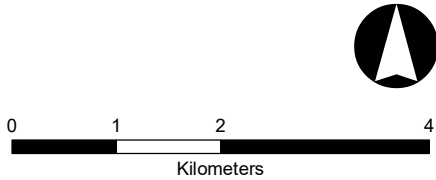


Legend

- WTG
- Mast (permanent)
- Mast (temporary)
- Turbine hardstand
- Access track
- Cables - overhead 275kV
- Cables - overhead 33kV
- Cables - underground
- Existing 275kV transmission line
- Road
- Infrastructure
- Planning corridor
- Project boundary
- Eucalypt woodland / forest
- Riparian woodland / grassland
- Vine thicket
- Grassland

Tarong West Project Co Pty Ltd

Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland



Job number: PR6944
Revision: 0
Author: KF
Date: 11/27/2024

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



Data Sources: © Ecosure Pty Ltd 2024; Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
ECOSURE does not warrant the accuracy or completeness of information displayed in this map. Any person using this map does so at their own risk, and should consider the context of the report that this map supports. ECOSURE shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

2.3 Fauna species

A total of 262 species of fauna have been detected within the site over the combined surveys spanning from 2018 to 2023 (Ecosure 2023a and b). The combined surveys recorded:

- 16 amphibians (including one pest)
- 193 birds (including two introduced species)
- 44 mammals (including six pests)
- 16 reptiles.

2.4 Threatened fauna habitat

Five EPBC Act and/or NC Act listed threatened fauna species are known to occur within or adjacent to the project site (Table 3, Ecosure 2023a and b). These include:

- koala (*Phascolarctos cinereus*)
- greater glider (EPBC Act *Petauroides volans*, NC Act *Petauroides armillatus*)
- grey-headed flying-fox (*Pteropus poliocephalus*)
- glossy black-cockatoo (*Calyptorhynchus lathami lathami*)
- white-throated needletail (*Hirundapus caudacutus*).

An assessment of the potential for other threatened species to occur was completed as part of the Ecological Assessment and none were considered likely to occur (Ecosure 2023a). Profiles of these species are found in Appendix 1.

Table 3 Results of surveys for EPBC Act and/or NC Act listed fauna species

Species	EPBC Act	NC Act	Survey results	Habitat description
koala (<i>Phascolarctos cinereus</i>)	E	E	16 sightings (13 within and 3 outside project boundary), 21 other detections (scat or scratches)	The koala occurs in a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus trees. Primarily associated with RE 11.3.25, but food species are also a component of remnant, HVR and non-remnant vegetation (including REs 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).
greater glider (EPBC Act <i>Petauroides Volans</i> ; NC Act <i>Petauroides armillatus</i>)	E	E	70 sightings	Habitat preferences were found to be within lemon-scented gum dominated forests (RE 11.7.6, 11.11.4, 11.12.6) on hill crests and in generally remnant vegetation communities (DCCEEW 2022a). Suitable habitat exists within productive communities on alluvial soils dominated by Queensland blue gum (RE 11.3.25) and tall eucalypt forests. Greater gliders within habitats containing REs 11.11.4, 11.11.15, 11.12.3 and

Species	EPBC Act	NC Act	Survey results	Habitat description
				11.12.6, primarily on hill crests. Habitat assessments recorded large hollow-bearing trees in all of these REs, which may provide denning resources.
grey-headed flying-fox (<i>Pteropus poliocephalus</i>)	V	LC	12 sightings	<p>Sub-tropical and temperate rainforest, tall open forest, swamps, heaths and urban areas. Roosting sites usually in dense forest adjacent to waterbodies. Forages within 50 km of camp in flowering trees or rainforests, eucalypts, paperbarks and banksias (DAWE 2021).</p> <p>Observed foraging within the site during the spring 2021 surveys when food species were in flower, although no habitats are considered to be critical food sources for this species.</p> <p>The nearest known grey-headed flying-fox camp is near Cooyar (38 km south-east of site).</p>
glossy black-cockatoo (<i>Calyptrorhynchus lathami lathami</i>)	V	V	7 sightings, 21 other detections	<p>Suitable foraging habitat exists in small patches amongst forest and woodland communities across the site.</p> <p>A total of seven glossy black-cockatoo individuals were observed, two adjacent to a dam and five in a forested area. Signs of chewings (orts) have been observed in patches of woodland containing <i>Allocasuarina torulosa</i>, <i>A. littoralis</i>, <i>A. luehmannii</i> and <i>Casuarina cunninghamiana</i>. Habitat assessments recorded large hollow-bearing trees in remnant REs, which may provide nesting resources.</p>
white-throated needletail (<i>Hirundapus caudacutus</i>)	V, Mi	V	364 sightings	<p>This species is almost entirely aerial and rarely lands, none have been observed roosting in the project site. It does not breed in Australia.</p> <p>Low to very high, open airspace over almost any habitat, including oceans, forests and deserts. At times gather over ranges, headlands, often in humid, unsettled weather preceding thunderstorms (TSSC 2019).</p> <p>Observed foraging aerially on site.</p>

EPBC Act status: E - Endangered, V – Vulnerable, Mi – Migratory Species.

NC Act: E – Endangered, V – Vulnerable, LC – Least concern.

2.5 Other conservation significant species

Other conservation significant species detected within the site include species listed SLC under the NC Act and birds listed as migratory under the EPBC Act.

The short-beaked echidna, listed as SLC under the NC Act, was detected (includes sightings of live animals and scats) at several locations within the project site. Table 4 summarises the other conservation significant species confirmed at the project site. Profiles of these species are found in Appendix 1.

Table 4 Results of surveys for other conservation significant fauna species

Species	EPBC Act	NC Act	Survey results	Habitat description
short-beaked echidna (<i>Tachyglossus aculeatus</i>)	-	SLC	6 sightings	Short-beaked echidnas use all habitat types that occur in Australia and are one of the few species that has an entirely Australia-wide distribution. Inhabits forests and woodlands, heath, grasslands and arid environments (Menkhorst & Knight 2011). The entirety of the project site is suitable habitat for the short-beaked echidna.
white-throated needletail (<i>Hirundapus caudacutus</i>)	V, Mi	V	364 sightings between 2018 and 2023	This species is almost entirely aerial and rarely lands, none have been observed roosting in the project site. It does not breed in Australia. Low to very high, open airspace over almost any habitat, including oceans, forests and deserts. At times gather over ranges, headlands, often in humid, unsettled weather preceding thunderstorms (TSSC 2019). Observed foraging aerially on site.
fork-tailed swift (<i>Apus pacificus</i>)	Mi	SLC	3 sightings	This species is an exclusively aerial forager, which is believed to roost on the wing. The fork-tailed swift does not breed in Australia. Species is found across a range of habitats, from inland open plains to wooded areas, where it is exclusively aerial (DoE 2015). Sighting occurred over open woodland and grassland in the east of the project site.

EPBC Act status: Mi – Migratory Species

NC Act: SLC – Special Least Concern.

3 Proposed impacts and mitigation

3.1 Impacts on fauna and fauna habitat

Potential impacts to fauna habitat may result from a number of aspects of the project including clearing of remnant and regrowth areas of vegetation and the resulting loss or fragmentation of habitats. These impacted habitats and habitat features provide shelter or foraging resources for fauna. Shelter resources include hollow-bearing trees (nesting and denning locations for arboreal birds and mammals), woody debris including bark (shelter for reptiles), and complex vegetation structures (shelter for small birds). Foraging resources include flowers/fruits and invertebrates sheltering within the habitats (food for a variety of species). The maximum clearing footprint is 871.87 ha.

Habitat can also be adversely impacted by:

- deterioration of aquatic habitats due to installation of drainage works and watercourse crossings for access
- loss or alteration of habitat due to weed infestation
- facilitation of the movement of pest animals into new areas, including scavenger species attracted by carrion, resulting in habitat degradation or predation
- edge effects resulting from the exposure of increased extents of the vegetation interface with fire, weed, grazing, dust and other pressures (e.g. noise and light).

In addition to the loss of habitat and the reduced quality of habitat due to fragmentation and edge effects, impacts on fauna may result from:

- interactions between fauna and construction vehicles or personnel resulting in direct mortality or movement of animals away from preferred habitats
- ongoing disturbance to wildlife (e.g. avoidance of habitat adjacent to WTGs)
- entrapment of fauna in trenching during construction
- disturbance of nocturnal species as a result of night time works
- infection by pathogens carried on equipment and machinery.

3.1.1 Proposed impacts on threatened fauna habitats

Table 5 outlines the maximum proposed clearing for project infrastructure on threatened fauna habitat.

The koala could potentially be impacted as the result of the proposed project due to loss of foraging habitat. Construction impacts to koalas include the clearing of up to 130.66 ha of preferred and general habitat (15.46 ha of preferred habitat remnant vegetation and 115.2 ha of modelled general habitat within non-remnant vegetation), and a further 139.86 ha of modelled general low habitat within non-remnant areas, that could reduce habitat availability

and connectivity, increase risk of predation from terrestrial predators such as dogs and exacerbate stress-induced disease. Mainly during construction, but also during ongoing operational activities post-construction, the risk of vehicle strike for koalas will increase, particularly when koalas are most active (e.g. at night and in the lead up to the breeding season from July to September). Construction will clear up to a further 347.16 ha of koala dispersal habitat, which is 10.3% of available dispersal habitat within the project site. However, as the project is linear in nature the ecological function of this habitat will remain and be unimpacted, without physical barrier to koala movement and dispersal. Whilst there may be some interference with that dispersal habitat, it will remain safe dispersal habitat, without fencing and low speed (<40 km/hr) internal maintenance access tracks. No limitation to ecological function will come about from the clearing of this dispersal habitat.

Up to 15.46 ha of preferred denning and foraging habitat and 112.08 ha of potential greater glider habitat comprising future food and den trees in non-remnant areas will be cleared within the clearing footprint for the construction of project infrastructure. In addition to the impacts of habitat loss, fragmentation of remnant habitat patches by clearing areas greater than 50 m wide will likely force gliders to traverse across the ground increasing their susceptibility to predation (Taylor and Goldingay 2014). This equates to the removal of 142.58 ha of modelled dispersal habitat within non-remnant areas. Operational activities are unlikely to directly impact significantly on greater gliders. However, construction and operational activities may disrupt the breeding cycle of greater glider.

The current design may remove up to 130.65 ha of secondary foraging habitat (remnant and HVR, and forested / woodland habitat within 100m of a watercourse) and 139.86 ha of tertiary foraging habitat (non remnant habitat) for the grey-headed flying-fox, which is only 2.82% of potential habitat within the project site. Given the high mobility of this species and the abundance of flowering eucalypts in the region, construction activities are unlikely to disrupt the breeding cycle of grey-headed flying-fox. Operational impacts to grey-headed flying-fox are likely to be limited to direct strike if travelling within the rotor swept area (RSA) and disturbance from WTGs to foraging habitat when trees are in flower and fruit. Blade strike issues are assessed and discussed in more detail in the BBMP (Ecosure 2024b).

Approximately 15.46 ha of potential roosting habitat for white-throated needletail will be cleared for the construction of project infrastructure. However, surveys did not record any roosting and large areas of similar habitat are available within the project site and the surrounding region. Construction activities are unlikely to impact significantly on feeding habitat, as this species is an aerial forager, nor breeding activities as this species does not breed in Australia. Potential operational impacts include blade strike when flying and foraging at RSA height.

Approximately 15.46 ha of potential foraging habitat and 72.4 ha (108 possible trees) of modelled potential breeding (nesting) habitat for glossy black-cockatoo will be cleared for the construction of project infrastructure but large areas of similar habitat are available within the project site and the surrounding region. Construction activities are unlikely to significantly reduce foraging and breeding habitat. Some hollow-bearing trees may be removed during construction, micro-siting of WTGs and other infrastructure will avoid clearing these trees where possible. Operational impacts to glossy black-cockatoo are likely to be limited to direct

strike if travelling within the RSA and disturbance from WTGs to breeding behaviours.

Table 5 Maximum proposed clearing for project infrastructure on threatened fauna habitat

Species	Potential habitat	Maximum proposed clearing within clearing footprint (ha)	Total habitat within project site (ha)	% of total habitat within project site
koala	Remnant/HVR REs containing koala food trees Non-remnant vegetation with - woody vegetation foliage projective cover > 125 and mapped as pre-clear REs containing koala food trees	130.66 (15.46 remnant preferred habitat, 115.2 non-remnant general habitat) 139.86 ha of modelled general low habitat within non-remnant areas.	5,720.43 (1,631.71 of preferred habitat, 4,088.72 of general habitat) 4,321.01 of modelled general low habitat	2.28% - preferred and general habitat
	Dispersal habitat includes non-remnant areas with scattered trees linking patches of remnant and modelled habitat	347.16	3,370.89	10.3% of dispersal habitat
greater glider	Remnant/HVR REs 11.3.25, 11.11.4, 11.11.15, 11.12.3 and 11.12.6 Non-remnant vegetation with - woody vegetation foliage projective cover > 125 and mapped as pre-clear REs containing greater glider habitat trees	127.54 (15.46 Preferred foraging and denning habitat in remnant vegetation and 112.08 ha of Potential habitat with future food and den trees in non-remnant areas)	5,727.91 (1,631.71 remnant preferred foraging and denning habitat and 4,096.20 non-remnant potential and future denning habitat)	2.23% of preferred, habitat, potential foraging habitat and future denning habitat
	Dispersal habitat - Non-remnant areas containing low quality non-remnant woodlands providing sparse – very sparse coverage of trees	142.58	4,113.67	3.47% of dispersal habitat
grey-headed flying-fox	Potential foraging - Remnant/HVR REs and higher quality non-remnant woodland containing foraging habitat Low quality potential foraging habitat - Non-remnant vegetation containing foraging habitat	130.65 ha of secondary foraging habitat (remnant and HVR, and forested / woodland habitat within 100 m of a watercourse) 139.86 ha of tertiary foraging habitat (non remnant habitat)	5,270.43 potential foraging 4,321.01 potential foraging – low quality	2.82% of potential foraging habitat
glossy black-cockatoo	Remnant/HVR REs containing foraging habitat	15.46	1631.71	0.95%
	Remnant/HVR REs containing potential breeding habitat	72.4 ha (108 possible trees) of modelled potential breeding (nesting) habitat	1,851.45 (containing 3,064 trees)	3.91%
white-throated needletail	Roosting habitat: Remnant/HVR REs	15.46	1,631.71	0.95%

3.1.2 Impacts on other significant fauna habitats

Table 6 outlines the impact of project infrastructure on other significant fauna habitat.

Proposed clearing may result in the loss of feeding habitat and removal of some ecologically significant resting sites (e.g. logs, protective understorey vegetation) for the short-beaked echidna. However, short-beaked echidnas can utilise a wide range of remnant and non-remnant vegetation communities, sufficient habitat is likely to remain at the site during construction activities. In addition, short-beaked echidnas can easily transverse the proposed access tracks. While some habitat may be removed during clearing works, the project is unlikely to cause disruption to breeding sites that would impact significantly on local population. Operational activities may increase the risk of vehicle strike for short-beaked echidna.

Fork-tailed swifts have only been observed aurally and none were observed roosting across the project site. Construction impacts are not considered to impact this species as the project site is highly unlikely to provide roosting habitat, as they forage aurally and roost on the wing. Potential operational impacts include blade strike if flying and foraging at RSA height and disturbance of foraging habitat caused by the WTG operations. Blade strike issues are assessed and discussed in more detail in the BBMP (Ecosure 2024b).

Table 6 Maximum proposed clearing for project infrastructure on other significant fauna habitat

Species	Potential habitat	Maximum proposed clearing within clearing footprint (ha)	Total habitat within project site (ha)	% of total habitat within project site
short-beaked echidna	Entire project site	871.87	17,496.23	4.98%
fork-tailed swift	Airspace over farmland, woodlands, riparian zones, SEVT and ridges.	0	17,496.23	0%

3.2 Avoidance, minimisation and mitigation measures

The potential impacts of the project will be addressed in accordance with the impact minimisation hierarchy to:

- firstly avoid, then minimise, then mitigate any potential impacts on ecological values
- compensate (i.e. offset) any significant residual impacts.

The following management measures will be implemented to manage impacts to fauna during the construction, operation, and decommissioning of the Tarong West Wind Farm.

3.2.1 Avoidance of impacts

Most impacts to ecological values have been avoided through siting of infrastructure away from sensitive values. This includes the placement of WTGs and tracks away from regulated vegetation and watercourses as far as possible. During the projects design phase the clearing area has been reduced to 871.87 ha and also the impact areas to all species listed in section 2. Ongoing design of the project infrastructure will continue throughout the remaining development and construction phase, and allow for refinements within the clearing footprint, which may result in a further reduced impact area. During the construction phase, micro-siting of infrastructure will also be implemented to avoid important habitat features such as hollow-bearing trees and food trees, where engineering solutions can allow.

The development process for wind farms occurs gradually over time as new data is gained and analysed and solutions are developed to overcome resource, engineering, environmental and social issues. In practical terms, this means that the locations of WTGs, construction pads, cable routes and tracks change frequently, but generally within a defined planning corridor. This process is termed 'micro-siting' and allows for small changes to the project design to overcome site constraints. The current planning corridor and clearing footprint is shown in Figure 2. The proponent has progressed the Project design to a level that allows increased accuracy of the required clearing footprint area. This is evident through the reduced overall area of disturbance across the site in comparison to the previous design submitted for referral. Minor micro-siting within the clearing footprint may still occur to assist with avoiding key habitat features such as hollow bearing trees, where design allows.

The current design will remove up to a maximum of 15.46 ha of ground-truthed remnant vegetation. This clearing represents 0.95% of the total remnant and HVR vegetation in the project site. As the project design progresses, all practicable efforts will be made to avoid impacts to vegetation communities and fauna habitats, including seasonal impacts (including foraging periods or breeding seasons) to flora and fauna.

Pre-clear surveys will be conducted prior to construction activities to allow for identification of fauna habitat features which can be potentially avoided during the micro-siting phase.

3.2.2 Minimisation of impacts

Where avoidance of an impact is not possible, impacts have been minimised by redesign and/or relocation of infrastructure. Impacts to ecological values will be minimised by implementing the following measures:

- siting of infrastructure in areas that have already been cleared
- siting of infrastructure on the edge of vegetation patches to reduce fragmentation
- micro-site WTGs using engineering solutions where available to maximise separation from the edges of remnant vegetation
- micro-site the location of access tracks and other infrastructure based on the results of pre-clear fauna surveys, reconfiguring infrastructure to minimise the amount of vegetation impacted (e.g. elongating pad dimensions may be possible on some sites)

- upgrade existing farm tracks for construction traffic to minimise the amount of vegetation requiring removal and reducing fragmentation (compared with clearing required for new tracks)
- minimise track widths as far as practicable while still allowing vehicle and plant access
- minimise the width of new and upgraded tracks within sensitive habitats such as stream crossings or through remnant/HVR vegetation
- retain the ground stratum and top soil as far as practicable (e.g. by trimming trees and woody shrubs rather than undertaking ground disturbance works) in areas adjacent to tracks and watercourse crossings, in order to retain soil structure and prevent erosion
- where engineering allows, large hollow-bearing trees that provide important nesting habitat for threatened species (e.g. greater glider or glossy black-cockatoo) will be retained, these hollows are to be identified during pre-clearing surveys (as detailed in section 4.3.2) and the potential retention of these features will be discussed with the project ecologist and engineering design team
- vegetation clearing boundaries will be clearly demarcated, and areas outside clearing boundaries will be designated as “no go” zones to avoid accidental damage to adjacent vegetation
- pre-clear surveys will be conducted at appropriate timeframes to identify habitat features before clearing commences and allow development of an appropriate tree removal procedure
- a traffic management plan will be developed and implemented to minimise damage to sensitive ecological areas and injury/mortality of fauna. A traffic management plan for the project will incorporate measures to reduce the risk of collisions with vehicles including:
 - limiting vehicle traffic to authorised tracks and roads
 - minimise travel at dawn and dusk and at night, wherever possible
 - reduced traffic speed limits at night
 - minimise the number of vehicles on site by carpooling, wherever possible
 - enforcing strict speed limits and fauna safe behaviour through signage and staff training
- presence of a fauna spotter catcher during habitat clearing works (e.g. trees, shrubs, earthen banks, built infrastructure, waterbodies or grassed areas) and disturbance of stockpiles to detect fauna and conduct appropriate capture and release methods
- where scheduling requirements allow and where agreed upon between the construction team and project ecologist, construction will be scheduled to avoid seasonal foraging or breeding seasons of threatened fauna
- trees to be retained adjacent to work sites will be protected via tree protection zones (TPZs) (e.g. refer to Australian Standard AS4970-2009 Protection of trees on

development sites) or as advised by a suitably qualified and experienced arborist (Australian Qualification Framework Level 5)

- appropriate environmental management procedures will be developed in a construction environmental management plan (e.g. erosion and sediment control, dust suppression, stockpile management, weed and pest animal management, offsite rubbish disposal)
- wildlife management measures (e.g. escape devices or fencing) will be implemented during construction to reduce the potential for entrapment of fauna in trenches
- monitoring programs will be implemented to enable management of pest animals during the construction and operation phases of the project.

3.2.3 Mitigation of impacts

After impacts have been avoided and minimised as far as practicable, remaining impacts will be mitigated. Mitigation strategies include:

- rehabilitating disturbed areas following completion of construction activities such as temporary WTG construction pads, laydown areas and other temporary infrastructure (e.g., construction compounds)
- rehabilitating unused verges alongside tracks within sensitive habitats (e.g. remnant vegetation, habitat containing hollow-bearing trees, vegetation adjacent to watercourses) following construction
- protection and potential restoration of any vegetation corridors that may facilitate the long-term survival and dispersal of the threatened fauna species identified within the project site
- installation of wildlife movement or nesting furniture or structures (e.g., glider poles, nest boxes for unavoidable loss of hollows)
- implementation of a pest animal management plan.

General minimising and mitigating strategies are provided in Table 7.

Table 7 Potential impacts to ecological values and recommended avoidance, minimisation and mitigation measures

Potential impact	Avoidance, minimisation and mitigation measures
Removal of habitat	<p>Keep clearing footprints to a minimum.</p> <p>Set clear boundaries for clearing works.</p> <p>Tree felling to occur only where strictly necessary, in the first instance consider removal of limbs from trees rather than entire trees (e.g. adjacent to tracks and waterway crossings).</p> <p>Avoid removal of vegetation through micro-siting infrastructure in already cleared areas within the clearing footprint.</p>
Declines in threatened species populations	<p>Avoid vegetation clearing where previously cleared areas in the project site are available for the location of infrastructure.</p> <p>Avoid removal of critically important features of threatened species habitats (e.g. large hollow-bearing trees for greater gliders), only removing when there is no</p>

Potential impact	Avoidance, minimisation and mitigation measures
	feasible alternative (e.g. micro-siting infrastructure away from the important feature). Use fauna spotter catchers to identify and, if necessary, relocate threatened fauna before clearing works. Clearing will be completed in a sequential manner to allow fauna to first self-relocate. Establish temporary exclusion fencing to minimise entrapment, injury and/or mortality of fauna in sensitive areas during construction. Enforce traffic speed limits to minimise fauna injury/mortality.
Erosion of waterways	Best Practice Erosion and Sediment Control Guidelines (IECA 2008) to be followed to prevent off-site impacts to downstream receiving environments.
Removal of hollow-bearing trees or logs	Large logs and hollow limbs cleared during construction will be placed in adjacent vegetation, so they can be used for habitat.
Removal of potential and active breeding sites	Fauna spotter catcher to undertake pre-clear survey to identify habitat features and potential breeding sites prior to clearing works so that eggs or young can be removed and taken to qualified carer. A Queensland approved SMP high risk of impacts will be implemented for potential impacts to the breeding places of threatened and colonial breeding species.
Death or injury to fauna	Fauna spotter catcher to check fauna habitat prior to and during clearing. Fauna spotter catcher to check creeks and drainage lines for frogs and aquatic fauna prior to any proposed works in waterways. Have contact details of qualified carer to take any fauna injured or orphaned during works for rehabilitation.
Spread of weeds	Restricted weed species within the clearing footprint must be treated prior to construction commencing using an appropriate control technique to minimise the spread of weeds. Weed control may require additional treatments during construction if new or seasonal weeds are identified and or may require additional treatment. Refer to the Vegetation Management Plan (Ecosure 2024c) for effective treatment options. Reasonable control would include treating individual plants with a registered herbicide, which must be applied by an experienced and licenced weed control contractor. Ensure all vehicles and plant are washed down prior to entering site.
Spread of pest animals	Restricted pest animals must be managed to minimise biosecurity risks. During construction and operation, rubbish and food waste must be appropriately stored and disposed off-site to minimise attracting foxes, wild dogs and pigs.

4 Fauna management

4.1 Applicable legislation

All native vertebrate fauna are protected animals under the NC Act. It is an offence to take (wound, kill, harm or injure) a protected animal without approval. It is also an offence to tamper with the breeding place of a protected animal unless in accordance with an authorised SMP for the project (Section 1.6).

Following the actions detailed within this FMP will help meet the purpose of the NC Act and meet the requirements of the associated guidelines. This FMP provides the appropriate guidance to minimise direct or indirect impacts on fauna during construction and operation works. The management and mitigation actions detailed within the FMP have been developed for species identified as confirmed at the project site through the onsite and desktop assessment (see Section 2.4 and 2.5 of this plan, and Ecosure 2024b and Ecosure 2023a).

4.2 Timing of clearing

Ideally, vegetation clearing within mapped threatened fauna habitats should be completed outside of threatened species breeding or foraging seasons. Although this is not always possible, it is important to understand these sensitive seasons to minimise potential impacts and refine the clearing schedule wherever possible. Regardless of when clearing is completed, contractors and visitors to site must be made aware of these sensitive periods for threatened fauna during site inductions prior to works occurring.

The threatened and SLC species breeding seasons to be aware of include:

- koala mating occurs between December and March and young are born 35 days later. The young remain in the pouch for up to five to six months and are weaned at seven months and start to consume leaves. The young rides on its mothers back up to 12 months old, whereby the mother will become pregnant again (Martin et al. 2008)
- greater glider breed between March and June and young emerge from the pouch when they are three to four months old and are carried on their mothers back or remain in the den tree. Juveniles become independent at seven months old (McKay 2008)
- grey-headed flying-foxes breed between January and April and young are born in October. Young are carried on the chest of the foraging mothers for the first four to five weeks of age (Martin et al. 1996)
- white-throated needletails do not breed within Australia (Tarburton 2021)
- glossy black-cockatoo lay eggs between March and June. The female incubates the egg/s and the fledgling leaves the nest at around three months and is fed by both parents until the following breeding season. Glossy black-cockatoos that successfully

raise a chick will forgo the following breeding season (Glossy Black Conservancy 2010)

- short-beaked echidna mating occurs in July and August. The female constructs a short burrow in which to lay their solitary egg. Some females remain in the burrow until the egg hatches while others carry the egg in their pouch. When the mother leaves the burrow with the young inside, she seals the entrance. Juveniles generally emerge from September to November (Augee 2008)
- fork-tailed swifts do not breed within Australia (DoE 2015).

Clearing of vegetation outside of these species' breeding seasons will be difficult and parental care is given for koala, greater glider and glossy black-cockatoo for up to one year following birth/hatching. Therefore, the location of threatened and SLC habitat within the project site combined with the breeding behaviour of the relevant species will be used to guide the vegetation clearing location and schedule as best as possible. As such, identification and avoidance of actively utilised breeding trees and habitat will be prioritised, wherever possible. Should an active breeding place be identified, clearing must comply with an approved SMP. An appropriate SMP will be prepared for low-risk and high-risk species prior to any activities that may involve tampering with a breeding place.

4.3 Management approach prior to clearing

4.3.1 Targeted field surveys

Targeted field surveys have been completed by Ecosure, refer to the Ecological Assessment (Ecosure 2023a). The results from targeted fauna surveys have been used in the final WTG layout to minimise impacting fauna habitat.

4.3.2 Pre-clear surveys

Pre-clearance surveys will be comply with the Code of Practice for Fauna Spotter Catchers (Hanger J. and Nottidge B. 2009). Pre-clearance surveys will be completed at several stages before and during construction. Pre-clear surveys identify the potential presence of threatened fauna and fauna habitat within all significant habitats to be disturbed. The pre-clear survey includes:

- walk-through assessment:
 - to identify the potential presence of threatened fauna within all significant habitats to be disturbed
 - will occur 1 - 2 months before any clearing or construction commences
 - will cover the area proposed to be disturbed
 - will identify hollows to be cleared which are suitable for greater glider denning or glossy black-cockatoo nesting, and inform the installation of replacement nest boxes and allow for the early intervention of micro-siting
 - will be completed by a suitably qualified ecologist

- first pre-clear survey
 - to identify active and inactive breeding locations where accessible
 - will be completed at least 24 hours and up to seven days prior to clearing
 - will identify and mark potential animal breeding places and hollow-bearing trees
 - will assess nearby vegetation/fauna habitat for suitability for animal relocation
 - will be completed by a suitably qualified ecologist
- second pre-clear survey
 - to identify whether fauna is still present that needs to be relocated or left in situ and avoided for the time being, whether breeding or foraging places are being utilised, or to identify other features that need to be retained at that time and or works rescheduled
 - assessments undertaken immediately prior to clearing
 - will be completed by a fauna spotter catcher.

4.4 Management approach during clearing

During clearing works, clearing contractors and Fauna Spotter Catchers will understand and comply with the Code of Practice for Fauna Spotter Catchers (Hanger J. and Nottidge B. 2009). During clearing works the following will occur:

- all vegetation clearing and tree felling must be conducted under the guidance of a suitably qualified fauna spotter catcher (FSC)
- one FSC is to be present for each piece of clearing equipment (i.e. excavator or bulldozer), unless they are working nearby and the FSC is able to safely and effectively service more than one machine
- communication (e.g. UHF radio) between the FSC and the clearing machine operator is to be maintained at all times
- the FSC is to search ahead of clearing works for the presence of fauna in trees, beneath logs, bark or in hollows or shrubs and for burrowing bird nests
- in the event of a non-threatened animal being located that cannot be immediately captured and relocated, an area of 5 m radius will be established around the tree / location and felling / construction activities must cease in that area until the animal has relocated or an alternative capture method has been agreed upon
- in the event a threatened animal is located, an area of 50 m will be established around the tree or any tree with an overlapping crown that is proposed to be removed and felling / construction activities must cease in that area until the animal has self-relocated or an alternative capture method has been agreed upon
- a FSC must be present during mulching of cleared vegetation if stockpiled longer than 24 hours prior to processing to assess for fauna which has moved into the stockpile

- a wildlife carer will be immediately contacted in an unforeseen event that an animal is injured or orphaned during the clearing works.

4.4.1 Hollow-bearing trees

Hollow-bearing trees may contain nesting or denning fauna which are at risk of injury or mortality if the tree is felled without consideration of this risk. Fauna may reside in hollows within branches, within the trunk of the tree, or within vents. If hollow bearing trees are present the following will be implemented to reduce the risk of impacts to fauna:

- as part of the micro-siting process, clearing hollow-bearing trees will be avoided where engineering allows as they provide significant resources for threatened and least concern fauna species
- hollow bearing trees will be left in situ as long as possible (minimum 24 hours where possible) prior to felling, while smaller trees around them are cleared to encourage fauna to relocate on their own
- if fauna breeding activity is confirmed within tree hollows, nests or arboreal termite mounds and fauna cannot be safely removed by any method, the tree will be left in-situ until the breeding activity has completed, unless otherwise stated in the approved SMP (i.e. high-risk or low-risk of impacts)
- trees with hollows, arboreal termite mounds or nests where no obvious breeding activity is observed will be laid over as gently as possible (soft felled) in a direction that is likely to reduce damage to the habitat feature and minimise deceleration injuries and/or death to any animals that may be inside the hollows or nests
- felled trees with hollows will be moved adjacent to the work area to remain as potential habitat for animals.

4.4.2 Relocation of fauna

If fauna are to be relocated from the clearing footprint, there is a hierarchy from first preference (ideal) to lowest preference (last resort):

- relocation to suitable habitat within project site
- relocation to suitable habitat adjacent/near project site
- placement within a rehabilitation program with the individual to be released in the future
- individual to be placed into an educational, research or conservation facility.

All vegetation is proposed to be removed from the clearing footprint, however there will be suitable habitat for fauna relocation remaining on the project site in the areas of retained vegetation outside the clearing footprint. Relocation areas must be assessed for suitability during the pre-clear assessment prior to the commencement of any clearing works. If the relocation site is deemed unsuitable, an alternative site will be required to be sourced prior to clearing works.

Where possible, stags and any large logs designated for removal will be retained as timber logs to be placed on the ground outside the vegetation clearing area, to be used as fauna habitat.

4.5 Management approach during construction

During the construction phase, the following measures will be implemented to reduce the risk of impacts to fauna:

- appropriate speed limits and signage, education of personnel, and implementation of buffers as outlined in the above sections (section 3.2, 4.3 and 4.4) will manage the increased interactions between fauna and construction vehicles or personnel resulting in direct mortality or movement of animals away from preferred habitats
- during trenching activities, open trenches will be monitored daily. If species are trapped in the trench they will be released by a FSC. The amount of open trench will be minimised and trenches will preferably be backfilled prior to nightfall. Escape ramps, ropes or planks and/or shelter (e.g. sawdust filled bags) for trapped fauna will be installed at 30 m intervals in open trenches where left open overnight
- no works are permitted to occur within ground-truthed greater glider habitat during night-time hours (between local dusk and dawn) to avoid disturbance of nocturnal species. Should night works be undertaken adjacent to greater glider habitats, all lighting used will be configured (i.e. guards and angle of lighting) to minimise light spill into adjacent habitats
- weed washdown facilities will be constructed at key access points and runoff contained on site to reduce transmission of weeds and infection by pathogens carried on equipment and machinery. For more information, refer to the Vegetation Management Plan (Ecosure 2024c)
- an erosion and sediment control plan will be developed to prevent deterioration of aquatic habitats due to installation of drainage works and watercourse crossings for access
- progressively rehabilitate cleared areas where appropriate, as soon as possible post-construction
- pest animal management as per Section 4.8 to reduce the movement of pest animals into new areas
- cleared vegetation stockpiles must not be pushed against retained vegetation including within the structural root zone of retained trees, this will aid in reducing fuel loads present within areas of retained vegetation and minimise harm to retained vegetation acting as habitat for fauna
- vegetation stockpiles must not be stored on site for extended periods of time (e.g. periods of several months) as local fauna may take up residence and be injured when the materials are eventually moved. If stockpiles (vegetation or construction materials) are stored for longer than 24 hrs a FSC is required to inspect the stockpile prior to disturbance. If fauna are observed to have taken up residence in stockpiled

materials at anytime during construction, all stockpile disturbance activities in that location must be stopped until the FSC removes the fauna from the immediate vicinity

- proper storage of chemicals and fuel, and spill management and response measures are to be developed and implemented in a construction environmental management plan.

4.6 Management approach during operation

Routine mitigation measures during operation will be undertaken to minimise the risks to fauna and fauna habitat. These mitigation measures include:

- where landowner requirements (e.g. stock management) or safety measures (e.g. surrounding electrical substations) do not require it, fencing will not include barbed wire
- fencing installed during construction should consider movement of fauna through or over the fence to minimise possible fauna entanglement (e.g. gliders, flying-foxes and birds). However, it is noted that this may not always be possible due to specific project requirements such as maintaining the existing farming use of the land, security and safety fencing
- appropriate speed limits to be enforced, signage installed and education of personnel conducted to reduce interactions between fauna and vehicles
- weed washdowns to reduce loss or alteration of habitat due to weed infestation
- pest animal management as per Section 4.8 to ensure the existing populations in the area do not increase
- reduce night time security lighting to the minimum required to decrease insect attraction to lighting. Where safety and security requirements allow lighting should be installed considering the National Light Pollution Guidelines for Wildlife (DCCEEW 2023a).

4.7 Threatened and conservation significant species management

Species-specific measures to manage threatened and conservation significant species considered likely or confirmed to occur on the site are detailed below.

4.7.1 Koala

Clearing works in koala habitat must be conducted with a suitably qualified FSC present to identify if koala are present within or adjacent to habitat to be cleared. Clearing works must be completed in a sequential manner to allow koalas to self-relocate. If koalas are observed, clearing works and/or earthworks are to be temporarily suspended within a range of 50 m from any tree which is occupied by a koala or any tree with an overlapping crown that is proposed

to be removed, until the koala has self relocated. Works will be avoided in any area between the koala and the nearest areas of habitat to be retained, to allow the animal to move to adjacent undisturbed areas. In addition, clearing will follow the guidelines established in the Nature Conservation (Koala) Conservation Plan 2017 for koala habitat within koala district C (State of Queensland 2023).

Specific actions to minimise impacts to koala include strict traffic management procedures (e.g. limited access routes, speed controls, limited night traffic) with reduced speeds during breeding season; rehabilitation works will include planting of locally important koala trees, especially in areas that provide connectivity between larger habitat patches; predator control if signs of koala predation or increased predator numbers are observed during construction; and weed and pest animal management during construction and operational phases to ensure safe movement of koalas within the project site.

4.7.2 Greater glider

Greater gliders shelter in tree hollows, with a preference for large hollows (diameter >10 cm) in large trees, that usually take 150 years to form in eucalypts, however both live and dead standing trees are used for denning (DCCEEW 2022b). Greater gliders use 4-20 den trees each and will co-utilise the same dens at different times (Smith et al. 2007). Active nocturnal spotlighting searches for greater gliders by the FSC are required during pre-clearance surveys and for any signs of denning prior to clearing works each day.

To minimise breeding disruption to this species, clearing will avoid areas of greater glider habitat during March to June where the construction schedule allows, as females give birth to a single young during this period (DCCEEW 2022b). If a tree in which a greater glider is suspected to be denning is identified for clearing, the tree shall be inspected for the presence of denning individuals.

If fauna denning or breeding activity is confirmed or suspected as likely within tree hollows an elevated work platform will be used (unless the site is unsuitable or inaccessible), to safely remove and relocate fauna to suitable habitat or appropriate care. If an elevated work platform cannot be used, where possible and safe to do so, an excavator with a vertical tree grab will be used to gently lower the tree to allow safe removal and relocation of fauna to suitable habitat or appropriate care. Where sheltering or breeding fauna cannot be safely removed by any method, the tree must be left in-situ until the fauna has self-relocated.

Trees with hollows where no evidence of sheltering or breeding activity is observed will be laid over as gently as possible using any method available, in a direction that is likely to reduce damage to the hollow and minimise deceleration injuries and/or death to animals.

Nest boxes will be installed in advance of clearing active glider hollows, to allow the resident population to become aware of their availability. Nest boxes for greater gliders will be installed at a minimum ratio of two nest boxes for every one hollow cleared which is suitable for greater glider use.

Vegetation clearing within greater glider habitat along Jumma Road may act as a barrier to

the movement and dispersal of the greater glider. Retention of the vegetation between the access track and the transmission line clearing, along with the installation of glide poles at key locations across this corridor in greater glider habitat (where the clearing footprint is greater than the maximum glide distance based on average tree height data and a glide distance ratio of 1.6) will facilitate the gap crossing for greater glider at this location. This will mitigate the impacts to their movement and dispersal with glide poles being installed as soon as possible after clearing and earthworks.

Glide poles will also be installed at key locations within the overhead transmission line clearing footprint to minimise fragmentation and maintain landscape connectivity to the greatest extent practicable for the greater glider and thereby maintain a suitable glide distance.

Where possible, access tracks will be narrowed (<25m wide) in order to retain tall trees on either side of the corridor and thereby maintain a suitable glide distance for the greater glider at those barriers. Maintenance of remnant patches of vegetation between tracks and overhead lines will be considered in order to maintain suitable glide distance. A string of glide poles will be considered in areas where the clearing footprint is less likely to be narrowed to an achievable glide distance (i.e. overhead transmission lines). Detailed design, tower placement, topography, and overhead line sagging profile (minimum heights) along with location of habitat connectivity will determine final location of the glide pole string.

Other specific measures important for mitigating impacts to greater glider in areas of mapped greater glider habitat during the construction phase include pre-clear surveys, sequential clearing and use of fauna spotter-catchers to identify and allow greater gliders to self-relocate during construction or be relocated, traffic management to minimise collisions, minimisation of track widths with retention of tall adjacent trees, undertake pest management and clearly identify and mark the extent of vegetation clearing and “no-go” zones prior to clearing activities to minimise the risk of accidental clearing (refer to Ecosure 2024c).

4.7.3 Grey-headed flying-fox

Active searches for flying-fox camps will be conducted by the FSC and ecologists during all pre-clearance surveys and will include any signs of roosting or foraging. As reliable foraging sources in spring are critical to the survival of the grey-headed flying-fox, removal of flowering eucalypts (as identified by a suitably qualified ecologist) will be avoided during spring where the construction schedule allows. Further management measures are outlined in the BBMP (Ecosure 2024b).

4.7.4 White-throated needletail

If a tree in which a white-throated needletail is suspected to be roosting is identified for clearing, the tree shall not be felled until the bird has vacated the tree on its own accord. Mitigating impacts for the white-throated needletail are challenging, as this species is an aerial forager and has only been observed aerially, demonstrating an intermittent presence at the site in response to varying weather patterns. Ongoing carcass monitoring to assess strike numbers of white-throated needletail, revised risk assessments and adaptive management measures will be applied during the operational phase, which is outlined in the BBMP (Ecosure

2024b).

4.7.5 Glossy black-cockatoo

As per section 4.2, where possible it is recommended that the removal of glossy black-cockatoo foraging and breeding habitat be scheduled outside of the breeding season (late January to late July) (Garnett et al. 1999). Glossy black-cockatoos require large, old tree hollows, positioned 10 m to 20 m above the ground in eucalypt species, in branches/stems 30 cm in diameter, at a branch/stem angle of vertical or no more than 45 degrees from vertical and with a minimum entrance diameter of 15 cm (Cameron 2006, Glossy Black Conservancy 2010). Habitat disturbance will be minimised by siting WTGs and other infrastructure as far away as practicable from remnant vegetation. Micro-siting within the clearing footprint will also aim to avoid the removal of hollow bearing trees, particularly in areas where (if any) suitable nesting hollows are identified nearby to watering points or large stands of known foraging areas, where possible. Further mitigation measures are outlined in the BBMP (Ecosure 2024b).

4.7.6 Short-beaked echidna

If a hollow log is suspected to contain a breeding female or young short-beaked echidna, then the hollow log will be picked up and moved to adjacent habitats, if possible. If the hollow log cannot be picked up or breaks apart, the FSC must capture the short-beaked echidna and/or young and relocate to a suitable log in adjacent habitat. The young may be taken to a wildlife carer if the FSC deems this necessary.

If a burrow is suspected to contain a breeding female or young, then the burrow will be checked by the FSC and if animals are present, the FSC must capture the short-beaked echidna and/or young and relocate to a suitable burrow or hollow log in adjacent habitat. The young may be taken to a wildlife carer if the FSC deems this necessary.

4.7.7 Fork-tailed swift

Fork-tailed swift are unlikely to utilise any vegetation on site as it is considered to be exclusively aerial (DoE 2015). However, if a tree in which a fork-tailed swift is suspected to be roosting is identified for clearing, the tree will not be felled until the bird has vacated the tree on its own accord. Mitigating impacts for the fork-tailed swift are challenging, as this species is an aerial forager and the intermittent presence at the site is in response to varying weather patterns. Ongoing carcass monitoring to assess strike numbers of fork-tailed swift, revised risk assessments and adaptive management measures will be applied during the operational phase, which is outlined in the BBMP (Ecosure 2024b).

4.7.8 SMPs

A high-risk SMP will be required prior to any activities that may involve tampering with a breeding place of greater gliders, grey-headed flying-fox, glossy black-cockatoo, short-beaked echidna, and least concern colonial breeding species. Least concern colonial breeding species identified to occur on site are the striated pardalote (*Pardalotus striatus*), spotted

pardalote (*Pardalotus punctatus*), fairy martin (*Petrochelidon ariel*), welcome swallow (*Hirundo neoxena*), rainbow bee-eater (*Merops ornatus*) and microbat species (*Austronomus* sp., *Chalinolobus* sp., *Miniopterus* sp., *Ozimops* sp., *Nyctophilus* sp., *Saccolaimus* sp., *Scotorepens* sp., and *Vespadelus* sp. identified as occurring on site [Ecosure 2023b]). Interfering with the breeding places of these species (for example, nesting hollows or earthen banks containing hollows) must be conducted in accordance with the measures set out in the SMP.

An SMP is not required for koala, as they do not have a habitual breeding place (DES 2020). SMPs are also not required for white-throated needletail or fork-tailed swift as these migratory species do not breed in Australia.

4.8 Pest animal management

Pest animals, including introduced predators, are present on the site and may impact on fauna displaced from cleared habitat. Therefore, the site must be managed to avoid increasing populations and attracting exotic predators to the work site.

A baseline of pest animal species on the impact site will be conducted using trail cameras. Presence, absence and estimated abundance of pest animal species will be determined. There will be ongoing monitoring for pest animals conducted on the impact site. A pest animal management plan will be developed prior to operation to ensure pest animal populations are managed and impacts to native fauna are minimised. Strategies may include disposing of putrescible wastes in sealed bins and regularly emptying them to avoid unnecessary attractants.

Evidence or sightings of pest animals on the site will be recorded in a register to remain on site. If sightings increase in frequency or new pest species are observed, appropriate management actions to control pest animals will be implemented.

4.9 Treatment / removal of injured fauna

If fauna are injured and require transportation to appropriate care, clearing work shall cease until the FSC advises clearing work can continue.

Any native fauna orphaned or injured during construction shall be reported to Queensland Parks and Wildlife Service 1300 130 372 and / or RSPCA on 1300 852 188 / 07 5575 6146.

Should least concern fauna become seriously injured to the extent that the injuries are likely to be fatal, euthanasia may be conducted in the field where safe to do so (suitably qualified personnel holding appropriate permits) or by a veterinarian or wildlife carer.

5 Risk assessment

Residual risk ratings were assigned to each impact according to the criteria set in the Environmental Management Plan Guidelines (DCCEEW 2024, Table 8). Each impact was assigned a likelihood of occurring (Table 8) and consequence should the impact occur (Table 9). The combination of impact likelihood and consequence was used to determine the risk rating (Table 10).

To ensure that impacts to fauna are managed at acceptable levels, the risk of the impact was assessed assuming no mitigation and management measures are implemented, and then was re-assessed assuming the mitigation and management measures detailed in this FMP are effectively implemented.

The control measures summarised in Table 11 and detailed in Section 4 must be implemented at each phase of construction (pre-construction, construction, and post-construction) to manage potential impacts to vegetation and maintain the residual risk rating to an acceptable level.

Table 8 Likelihood evaluation criteria

Likelihood	Qualitative assessment criteria
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances

Table 9 Consequence evaluation criteria

Consequence	Qualitative assessment criteria
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage
Major	Major loss of environmental amenity and real danger of continuing
High	Substantial instances of environmental damage that could be reversed with extensive efforts
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
Minor	Minor incident of environmental damage that can be reversed

Table 10 Risk rating matrix for impacts to fauna

	Consequence				
	Minor	Moderate	High	Major	Critical
Highly likely	Medium	High	High	Severe	Severe
Likely	Low	Medium	High	High	Severe
Possible	Low	Medium	Medium	High	Severe
Unlikely	Low	Low	Medium	High	High
Rare	Low	Low	Low	Medium	High

Table 11 Potential impacts to fauna, measures to mitigate these impacts and residual risk rating of impacts assuming effective implementation of mitigation measures

Impact	Initial risk			Management and mitigation measures	Residual risk		
	Likeli-hood	Conse-quence	Risk		Likeli-hood	Conse-quence	Risk
Loss, fragmentation, or degradation of habitat for conservation significant species	Likely	Major	High	Pre-construction Detailed measures to avoid impacts are presented in section 3.2.1. To summarise: <ul style="list-style-type: none"> · Clearing of remnant vegetation has been avoided. · WTGs and tracks have been sited as far away from remnant vegetation and watercourses as possible. Construction and decommissioning Detailed measures are presented in section 3.2, 4.3, 4.4, and 4.5. To summarise: <ul style="list-style-type: none"> · Micro-siting of infrastructure where engineering constraints allow to avoid clearing vegetation. · Set clear boundaries for vegetation clearing works. Operation Detailed measures are presented in section 4.6. To summarise: <ul style="list-style-type: none"> · Progressive rehabilitation will be implemented after construction including removing gravel, spreading stockpiled soil and seeding topsoil with native grass species. · Erosion and sediment control plan to manage impacts to watercourses. · Fauna-sensitive fencing design and fauna movement infrastructure to be installed. 	Unlikely	Moderate	Low
Behavioural disturbance	Likely	Moderate	Medium	Construction and decommissioning Detailed measures are presented in sections 3.2, 4.3, 4.4, and 4.5. To summarise: <ul style="list-style-type: none"> · No works will occur within ground-truthed greater glider habitat during night-time hours. Night works adjacent to greater glider habitat will be heavily controlled. · Establishment of a buffer around trees occupied by threatened fauna to allow for self-relocation. Operation Detailed measures are presented in section 4.6. To summarise: <ul style="list-style-type: none"> · Night time security lighting will be reduced to the minimum required in accordance with national light pollution guidelines. 	Unlikely	Minor	Low

Impact	Initial risk			Management and mitigation measures	Residual risk		
	Likeli-hood	Conse-quence	Risk		Likeli-hood	Conse-quence	Risk
Introduction or spread of weeds	Highly likely	High	High	Construction, operation, and decommissioning Detailed measures are presented in sections 3.2, 4.3, 4.4, and 4.5. To summarise: <ul style="list-style-type: none"> · All vehicles and machinery entering the site shall be washed down and certified appropriately. Refer to the Vegetation Management Plan for detailed washdown protocols (Ecosure 2024c) · Conduct appropriate weed control in accordance with the Vegetation Management Plan (Ecosure 2024c). 	Possible	Minor	Low
Introduction or spread of fauna pests	Possible	Moderate	Medium	Construction, operation, and decommissioning Detailed measures are presented in sections 3.2 and 4.8. To summarise: <ul style="list-style-type: none"> · Rubbish and food waste must be stored appropriately and disposed of off-site. · Record sightings or evidence of pest animals and implement humane pest control if numbers are observed to increase. 	Unlikely	Moderate	Low
Injury or mortality to fauna	Likely	High	High	Construction and decommissioning Detailed measures are presented in section 3.2, 4.3, 4.4, and 4.5. To summarise: <ul style="list-style-type: none"> · FSCs are to conduct pre-clearance surveys and are to be present during habitat clearing works to identify and relocate any fauna present. · Hollow-bearing trees will be managed carefully to reduce the risk of impacting breeding fauna. · Speed limits and signage will be in place to manage traffic impacts. Operation Detailed measures are presented in section 4.6. To summarise: <ul style="list-style-type: none"> · Speed limits and signage will be in place to manage traffic impacts. · Fauna-sensitive fencing management. 	Unlikely	High	Medium

6 Roles and responsibilities

6.1 Personnel and responsibilities

- The implementation of the FMP requirements across the project site is the responsibility of the site supervisor of the Principal Contractor during Construction and the proponent during the pre-construction and operation phases of the project.
- A suitably qualified Ecologist is a person with formal qualifications and/or experience in fauna identification and wildlife ecology and environmental management. A person is suitably qualified and experienced if they meet one or more of the following criteria:
 - an ecological consultant with experience in conducting fauna surveys
 - a person who possesses a degree in natural science or similar with experience in conducting fauna surveys.
- A suitably qualified FSC is a person qualified to take and keep protected wildlife under a current rehabilitation permit extended to authorise the take, keep or use of an animal whose habitat is about to be destroyed by human activity in accordance with the Nature Conservation (Animals) Regulation 2020.
- Appropriate permits to undertake fauna management are to be retained and followed by the suitably qualified FSC / Ecologist.
- All project contractors are to examine and understand this FMP. The FMP advises all individuals of their responsibilities toward the ethical management of fauna within the project site.
- All project contractors shall comply with all reasonable directions from the FSC and suitably qualified ecologist in fulfilling the measures in this FMP.
- All construction contractors and visitors will complete an induction prior to work on or visiting the project site. The inductions must include a component on fauna and fauna species and habitat present on the site and how to avoid, minimise or mitigate potential impacts to these species and habitat.
- A log of inducted personnel and visitors must be kept on site at all times.
- All construction contractors and site visitors have a duty of care as per section 319 of the *Environmental Protection Act 1994* to prevent environmental harm.
- All construction contractors and site visitors are obligated to report incidents involving fauna or their habitat. Reports must be made to the contractor's immediate supervisors or responsible person in charge of visitors.

6.2 Training

All construction contractors and visitors will complete an induction prior to work on or visiting the site. The induction must include a component on fauna present on the site and management measures in place to avoid, minimise or mitigate impacts to fauna. Inductions must include:

- significant fauna habitat
- “no-go” zones
- threatened fauna likely to be present
- other environmentally sensitive areas
- details on what is considered an adverse event and the corrective actions which must be applied should an adverse event occur.

A record of inducted personnel and visitors must be kept on site at all times and must be retained throughout the construction, operation, and decommissioning processes.

6.3 Monitoring and reporting

- Monitoring and reporting requirements will be implemented as part of this FMP by the proponent and / or the principal contractor, and where required by approval conditions reported to the relevant authorities.
- The FSC must keep records of all fauna species and breeding places interfered within during clearing. The Principal Contractor must report the records of all breeding places to DETSI in accordance with their approved SMP and the FSC must report all fauna species relocated in accordance with the Rehabilitation Permit conditions.
- The Principal Contractor must report on activities undertaken in accordance with any SMP conditions.
- Records of all monitoring activities (e.g. pest animal monitoring) must be recorded and reported to the relevant authorities. Additionally, any sightings of conservation significant (as listed in the induction material) fauna on site and its location should be recorded and kept in a register to inform construction and operations for the project.

7 Performance outcomes, corrective actions, and triggers for review

7.1 Performance outcomes

The success of this FMP in managing impacts to fauna will be determined by achievement of prescribed performance outcomes at each stage of the project (Table 12).

Table 12 Performance outcomes

Performance outcome	Frequency of assessment		
	Construction	Operation	Decommissioning
No mortality or injury to a threatened, TNT, or migratory species. (Note of blade strike during operation is detailed in the BBMP 2024).	Assessed daily by reviewing FSC reports.	Assessed daily by reviewing incident reports, if and when they arise.	Assessed daily by reviewing FSC reports.
No unintentional clearing or degradation of identified threatened species habitat outside of the approved project clearing impact area.	Assessed daily by reviewing vegetation clearing records.	Assessed every six months by field assessment of threatened species habitat where it occurs adjacent to project infrastructure.	Assessed daily by reviewing vegetation clearing records.
No outbreaks of weeds novel to the project area, and no new outbreaks of weeds known to occur in the project area.	Assessed monthly in all works areas.	Assessed twice per year across the project site.	Assessed monthly in all works areas.

Should these performance outcomes not be achieved, this will trigger an audit of the FMP and the implementation of corrective actions where adverse events have occurred, as described below.

7.2 Corrective actions

An impact trigger is when clearing works cause mortality or injury of threatened or SLC species or clearing of a breeding place or threatened fauna habitat (outside the clearing footprint). Consequently, triggers may be reviewed regularly depending upon the significance ascribed to various situations and the corrective actions employed throughout this management plan.

The following corrective actions (Table 13) must be undertaken if any of the following adverse events occur. In the case of any of these adverse events occurring, a review of this FMP will be triggered. Works will cease and management and mitigation processes in this FMP will be reviewed in the context of the specific incident. Should additional mitigation and management measures be identified as a result of this review, this FMP will be updated accordingly.

Table 13 Corrective actions in the case of adverse events

Adverse event	Corrective action
Clearing or degradation of identified threatened species habitat outside of the approved project clearing area.	Any clearing or degradation of threatened species habitat outside of the approved project clearing footprint as a result of the project's construction or operation must be reported immediately to the site supervisor and construction environmental officer on site. The site supervisor must report the incident to the relevant government department and in accordance with any relevant legislation or approvals. Remediation of disturbed threatened species habitat outside of the project clearing footprint will occur post-construction in accordance with a remediation plan written by a suitably qualified professional. The remediation actions will include clearing of waste, and planting and associated maintenance (e.g. watering and weed control) native vegetation present in the local area and consistent with the vegetation community that was cleared or degraded. Follow-up assessments of the impacted area must be conducted at appropriate timeframes as stepped out in the remediation plan (six months to a year) after planting to ensure successful recruitment and growth of vegetation.
Direct mortality, injury, or disturbance to a threatened, TNT, or migratory species (e.g. by vehicle strike or felling a tree containing a koala).	The environmental officer and FSC on site must be notified immediately and works must cease. If injured, the animal must be taken for treatment to a wildlife veterinarian as soon as possible. The incident must be reported to relevant Government authorities within 24 hours. The details of the specific incident will be acquired and assessed in the context of this FMP and the way in which management and mitigation measures are being implemented on-site. If the management and mitigation measures in this plan are not being implemented effectively, this will be addressed and all workers on-site re-educated as to their roles and responsibilities for managing impacts to threatened, TNT, and migratory species. If the management and mitigation measures in this plan are found to be insufficient, this FMP will be updated accordingly and all workers on-site re-educated as to their roles and responsibilities for managing impacts to threatened, TNT or migratory species.

Should any of these adverse events occur, a report must be made by the Principal Contractor (during construction) or proponent (during operation) containing the following information:

- date and location of adverse event
- specific details of adverse event (e.g. a koala crossed in front of operating machinery and was struck and killed)
- actions taken immediately (e.g. wildlife rescue were contacted, on-site FSC was notified and report was made to DES)
- assessment of the implementation of fauna management and mitigation measures in place at the time (e.g. temporary koala exclusion fencing had fallen down, allowing koala incursion into the clearing area)
- details of any improvements that can be made to the management and mitigation measures presented in this FMP, and details of any corrective actions that have been, or are to be, implemented.

7.3 Contingency planning

Contingency measures are required to modify the management measures detailed in this FMP when they cannot be complied with during works, are deemed ineffective, or if there is a detrimental impact. If required, the FMP management measures will be reviewed and contingency measures determined by a suitably qualified ecologist. The need for contingency measures may be identified by the contractor, the Principal Contractor's project ecologist, an

FSC, or relevant Government authorities.

Through successful implementation of mitigation measures described in the FMP, the potential fauna impacts are considered to be minimised. Impact management measures have been informed by those adopted in many other similar projects and approved FMPs that have effectively minimised risk, and as such are expected to be successful. If a limitation or threat to implementing impact management is identified during finalisation of detailed design (i.e. one that impedes following measures in the FMP) the proponent and / or Principal Contractor will submit an amendment to the relevant Government authority for approval.

Additionally, any incident relating to activities covered under a high-risk SMP will be recorded by the site environmental officer and reported to DETSI within 24 hours. Monitoring will occur throughout the project. If necessary, the relevant high-risk SMP management measures will be reviewed, and contingency measures determined by a suitably qualified ecologist. Any changes to the scope of the required high-risk SMP, including detection of new species breeding places, will be detailed in an amended version and submitted to DETSI prior to works continuing.

References

Augee ML 2008. *Greater glider*. The Mammals of Australia Third Edition, Reed New Holland, Sydney.

BoM 2022. *Climate data online, Kingaroy Airport Station (No. 040922)*, Available: www.bom.gov.au/climate/data, accessed: December 2022.

Cameron 2006. Nesting habitat of the glossy black-cockatoo in central New South Wales. *Biological Conservation*, vol. 127, pp. 402-410.

DAWE 2021. *National Recovery Plan for the Grey-headed Flying-fox* *Pteropus poliocephalus*. Department of Agriculture, Water and the Environment, Canberra.

DAWE 2022. *National Recovery Plan for the Koala: Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory)*. Department of Agriculture, Water and the Environment, Canberra.

DCCEEW 2022a. *Conservation Advice for Petauroides volans (greater glider (southern and central))*. Department of Climate Change, Energy, the Environment and Water, Canberra.

DCCEEW 2022b. *Guide to greater glider habitat in Queensland*. EPBC Act publications and resources. Department of Agriculture, Water and the Environment.

DCCEEW 2023a. *National Light Pollution Guidelines for Wildlife*. Department of Climate Change, Energy, the Environment and Water, Canberra.

DCCEEW 2023b. *Species profile and threats database*, Department of Climate Change, Energy, the Environment and Water, Canberra. Available: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

DCCEEW 2024. *Environmental management plan guidelines*. Department of Climate Change, Energy, the Environment and Water. Available: <https://www.dcceew.gov.au/sites/default/files/documents/environmental-management-plan-guidelines.pdf>.

DES 2020. *Species Management Program. Requirements for tampering with a protected animal breeding place in Queensland*. Department of Environment and Science.

DETSI 2024. *Wildlife online species database search*. Available: <https://apps.des.qld.gov.au/report-request/species-list/>, Department of Environment, Tourism, Science and Innovation, Brisbane.

DoE 2015. *Referral guideline for 14 birds listed as migratory species under the EPBC Act*. Department of Environment, Commonwealth of Australia.

Ecosure 2023a. *Ecological Assessment for Tarong West Wind Farm, Ironpot, Queensland*. Report to RES Australia.

Ecosure 2023b. *Tarong West Wind Farm Transport Route Ecological Assessment*. Report to RES Australia.

Ecosure 2023c. *Assessment of Matters of National Environmental Significance for Tarong West Wind Farm, Ironpot, Queensland*. Report to RES Australia.

Ecosure 2023d. *Preliminary Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland*. Report to RES Australia Pty Ltd.

Ecosure 2023e. *Preliminary Vegetation Management Plan for Tarong West Wind Farm, Ironpot, Queensland*. Report to RES Australia Pty Ltd.

Ecosure 2023f. *Preliminary Bird and Bat Management Plan for Tarong West Wind Farm, Ironpot, Queensland*. Report to RES Australia Pty Ltd.

Ecosure 2024a. *Addendum to the Assessment of Matters of National Environmental Significance for Tarong West Wind Farm, Ironpot, Queensland*. Report to Tarong West Project Co Pty Ltd.

Ecosure 2024b. *Bird and Bat Management Plan for Tarong West Wind Farm, Ironpot, Queensland*. Report to Tarong West Project Co Pty Ltd.

Ecosure 2024c. *Vegetation Management Plan for Tarong West Wind Farm, Ironpot, Queensland*. Report to Tarong West Project Co Pty Ltd.

Ecosure 2024d. *Bird and Bat Utilisation Survey for Tarong West Wind Farm*. Report to Tarong West Project Co Pty Ltd.

Environment and Heritage 2016. *NSW Scientific Committee Final Determination on the Greater Glider population in Seven Mile Beach National Park*. Heritage and Environment, NSW Government.

Garnett ST, Pedler LP and Crowley GM 1999. The Breeding Biology of the Glossy Black-Cockatoo *Calyptorhynchus lathami* on Kangaroo Island, South Australia. *Emu*, vol. 99, pp. 262-279.

Glossy Black Conservancy 2010. *Glossy Black-Cockatoo Conservation Guidelines for South-Eastern Queensland and Far North-Eastern New South Wales*. Glossy Black Conservancy.

Hanger J, Nottidge B 2009. *Queensland Code of Practice for the welfare of wild animals affected by land-clearing and other habitat impacts and wildlife spotter/catchers* – Draft.

Higgins PJ 1999. *Handbook of Australian, New Zealand and Antarctic Birds. Volume Four – Parrots to Dollarbird*. Oxford University Press, Melbourne.

Higgins PJ, Peter JM and Steele WK (eds) 2001. *Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant-flycatchers to Chats*. Melbourne, Victoria: Oxford University Press.

IECA 2008. *Best Practice Erosion and Sediment Control Guidelines*. International Erosion Control Association, Australasia Chapter, Picton, NSW.

Martin L, Kennedy JH, Little L, Luckoff HC, O'Brien GM, Pow CST, Towers PA, Waldon AK and DY Wang 1996. The reproductive biology of Australian flying-foxes (genus *Pteropus*). *Symposium of the Zoological Society of London*, vol. 67, pp.167-184.

Martin RW, Handasyde KA and Krockenberger A 2008. *The Mammals of Australia Third*

Edition. Reed New Holland, Sydney.

McKay GM 2008. *Greater Glider*. The Mammals of Australia, Third Edition. Reed New Holland, Sydney.

Menkhorst P and Knight F 2011. *A field guide to mammals of Australia*. Oxford University Press, Sydney.

Smith GC, Mathieson M and Hogan L 2007. Home range and habitat use of a low-density population of Greater Glider, *Petauroides volans* (Pseudocheiridae: Marsupialia), in a hollow-limiting environment. *Wildlife Research*, vol. 34, pp. 472-483.

State of Queensland 2023. *Nature Conservation (Koala) Conservation Plan 2017*. State of Queensland. Available: <https://www.legislation.qld.gov.au/view/pdf/inforce/current/sl-2017-0152>

Tarburton MK 2021. Recent increase in knowledge about numbers and flight behaviour in the White-throated Needletail *Hirundapus caudacutus*. *Australian Field Ornithology*, vol. 38, pp.124–130.

Taylor BD & Goldingay RS 2011. Restoring Connectivity in Landscapes Fragmented by Major Roads: A Case Study Using Wooden Poles as “Stepping Stones” for Gliding Mammals. *Restoration Ecology*, vol. 20(6), pp. 671-678.

TSSC 2019. *Conservation Advice* *Hirundapus caudacutus* *White-throated Needletail*. Threatened Species Scientific Committee, Department of the Environment and Energy, Canberra.

Appendix 1 Species profiles

Koala *Phascolarctos cinereus*

EPBC Act status	Endangered
NC Act status	Endangered
Likelihood of occurrence	Known
Species description	687 mm (females), 705 mm (males) body length 4.1 – 7.3 kg (females), 4.2 – 9.1 kg (males) Short, pale grey fur, vestigial tail, large ears (DAWE 2022)
Habitat within the site	16 individuals sighted (13 within and 3 adjacent to the project site), 14 scat detections, 7 scratched trees recorded during fauna surveys within the project site. Primarily associated with RE 11.3.25, but food species are also a component of remnant, HVR and non-remnant vegetation (including REs 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).
Relevant biology / ecology	<p>The koala is an arboreal folivore (leaf eater) that feeds on a variety of leaves from <i>Eucalyptus</i>, <i>Corymbia</i> and <i>Angophora</i> genera. Within Queensland, Queensland blue gum <i>Eucalyptus tereticornis</i> is an important food source as it provides a relatively high abundance of nutrients and higher leaf moisture than other species.</p> <p>They are solitary animals and generally stay within a home range that varies depending upon local food trees. Home ranges outside of high quality habitats (such as those on the Koala Coast in South East Queensland) may be up to 100 ha and males have larger home ranges than females.</p> <p>The breeding season occurs from spring to summer (December to March) with females giving birth after a 35 day gestation. The young remains in the pouch until 5-6 months when it weans and starts eating 'pap' which the mother produces. The young is fully weaned at 7 months, but will stay with the mother until the following breeding season (Martin et al. 1996).</p>



Photo: Koala, Source: Ecosure

Greater glider *Petauroides volans volans*

EPBC Act status	Endangered
NC Act status	Endangered
Likelihood of occurrence	Known
Species description	<p>350 – 400 mm body length 900 – 1700 g</p> <p>Dark grey, cream or mottled grey and cream above, whitish below. Long furry tail, short snout, very large furry ears (DCCEEW 2022).</p>
Habitat within the site	<p>Suitable habitat exists within productive communities on alluvial soils dominated by Queensland blue gum (RE 11.3.25) and tall eucalypt forests. A total of 70 greater gliders were detected during spotlighting surveys within habitats containing REs 11.11.4, 11.11.15, 11.12.3 and 11.12.6, primarily on hill crests. Habitat assessments recorded large hollow-bearing trees in all of these REs, which may provide denning resources.</p>
Relevant biology / ecology	<p>The greater glider is an arboreal folivore (leaf eater). It is nocturnal, emerging from its hollow den to feed on the leaves of Eucalyptus species. It is an agile climber and glider, covering up to 100 m in a glide and can change direction of up to 90 degrees. It is a known prey item of powerful owl.</p> <p>Greater gliders have a defined home range and males do not overlap. Female home ranges may overlap with other females and males. During the breeding season, males and females will share a den. Trees with a diameter at breast height of over 50 cm and old living trees are primarily used as denning trees. Gliders will utilise between 4-20 den trees, with females utilising more denning trees on average than males (Smith, Mathieson & Hogan 2007). The breeding season is from March to June and one young is born into the female's pouch. The young emerges at 3-4 months and may be carried on the mother's back or left in the den. Juveniles are independent at 9 months (DCCEEW 2022a; Smith, Mathieson & Hogan 2007).</p>



Photo: Greater gliders within the site. Source: D. Fleming

Grey-headed flying-fox *Pteropus poliocephalus*

EPBC Act status	Vulnerable
NC Act status	Least concern
Likelihood of occurrence	Known
Species description	<p>244 mm body length 410 – 1270 (average 780) g</p> <p>Large bat, has a mantle of rusty coloured fur completely encircling the neck. Fur on the back is dark grey, often with silver frosting. Fur extends down the legs to the toes.</p>
Habitat within the site	Habitat preferences include all remnant and HVR vegetation within the site as well as non-remnant vegetation where food trees are present. Observed foraging within the site during the spring 2021 surveys when food species were in flower, although no habitats are considered to be critical food sources for this species.
Relevant biology / ecology	<p>Feeds on a variety of nectar and blossom producing species as well as fruiting species. Their major food source is <i>Eucalyptus</i> blossom and are likely to feed within the site during infrequent large blossom events. Grey-headed flying-fox are seasonally nomadic and follow food resources throughout their range (central Qld to Victoria and South Australia). Camps occur in dense vegetation usually near water within paperbark <i>Melaleuca</i>, river oak <i>Casuarina cunninghamiana</i> or exotic trees. Individual bats can forage up to 50 km from camps (DAWE 2021).</p> <p>Male fertility peaks in March and females gestate for 6 months. Females congregate in maternity camps where a single young is born. The young is carried with the mother during early foraging trips and then is increasingly left in the maternity camp. The young bats leave the camp to forage with the females in January and February and are weaned by March.</p>



Photo: Grey-headed flying-fox. Source: National Park NSW <https://www.nationalparks.nsw.gov.au/plants-and-animals/grey-headed-flying-fox>

White-throated needletail *Hirundapus caudacutus*

EPBC Act status	Vulnerable, migratory
NC Act status	Vulnerable
Likelihood of occurrence	Known
Species description	19-21 cm body length 93 g Largest swift species. Heavy looking body tapering to a broad, short, square-cut tail white forehead and throat, glossy dark green above, brown below.
Habitat within the site	White-throated needletails are almost entirely aerial, occurring within high, open airspaces above almost all habitats including oceans. They will roost occasionally in trees within any habitats. This species is widespread across eastern and south-eastern Australia during the months of October – May (Higgins 1999).
Relevant biology / ecology	The species does not breed in Australia, migrating to their breeding grounds in northern Asia in May and returning in October. Like other swifts, the needletail at times gathers over ranges, headlands preceding thunderstorms when aerial insect activity is high (DoE 2015).



Photo: White-throated needletail. Source: Steve Burrows, via Atlas of Living Australia

Glossy black-cockatoo *Calyptorhynchus lathami lathami*

EPBC Act status	Vulnerable
NC Act status	Vulnerable
Likelihood of occurrence	Known
Species description	<p>460 – 510 mm body length 422 – 480 g (males), 430 – 500 g (females)</p> <p>Smallest of the black-cockatoos. They are generally black to sooty brown with bright red undertail coverts. The female has yellow feathers scattered through the head and neck. The beak is large and rounded. The crest is subdued (Glossy Black Conservancy 2010).</p>
Habitat within the site	<p>Suitable foraging habitat exists in small patches amongst forest and woodland communities across the site. A total of seven glossy black-cockatoo individuals were observed, two adjacent to a dam and five in a forested area. Signs of chewings (orts) have been observed in patches of woodland containing <i>Allocasuarina torulosa</i>, <i>A. littoralis</i>, <i>A. luehmannii</i> and <i>Casuarina cunninghamiana</i>. Habitat assessments recorded large hollow-bearing trees in remnant REs, which may provide denning resources.</p>
Relevant biology / ecology	<p>The glossy black-cockatoo is a habitat specialist that preferentially feeds on the seeds of oaks (<i>Casuarina</i>) and she-oaks (<i>Allocasuarina</i>) trees. They are essentially a temperate zone species and inhabits higher altitude sites in the north of their range. They prefer a range of woodland habitats where preferred food sources occur including <i>Eucalyptus</i>, <i>Corymbia</i> and <i>Angophora</i> woodlands or in patches dominated by oaks and she-oaks or brigalow <i>Acacia harpophylla</i>. Food trees can be identified by the presence of discarded seed cones (termed orts) at the base of trees.</p> <p>They mostly roost in the canopy of live, leafy trees such as eucalypts but breed in a hollow stump or limb of living or dead trees as well as holes in trunks of tall trees (Higgins et al. 2001). Roosts are usually less than 1 km from reliable water (e.g. dam). Glossy black-cockatoos lay a single egg from March to June and if a young is successfully raised, the parents will forgo the subsequent breeding season. Incubation of the egg lasts for 30 days and the chick fledges after 84-96 days. The chick is fed by both parents for 12 months following hatching and will roost with its parents (Glossy Black Conservancy 2010).</p>



Photo (left): Glossy black-cockatoo (female), (right) – chewed cones or 'orts'. Source: D Fleming

Short-beaked echidna *Tachyglossus aculeatus*

EPBC Act status	N/A
NC Act status	Special least concern
Likelihood of occurrence	Known
Species description	<p>30 – 45 cm in body length 2 – 7 kg</p> <p>Dorsal surface of body and rudimentary tail covered with spines. Fur present and becomes longer and thicker in southern areas of its range. Long tubular snout.</p>
Habitat within the site	Short-beaked echidna were opportunistically encountered in several locations throughout the project site including detection of live animals, and scats. They are expected to occur throughout the site within remnant and non-remnant habitats.
Relevant biology / ecology	<p>Short-beaked echidna does not have specific habitat requirements other than a ready supply of ants and termites on which it feeds. Its powerful forepaws rip apart termite mounds and ant nests and ingest the insects and their eggs that get adhered to the sticky tongue.</p> <p>Short-beaked echidnas enter a reduced hibernation state (torpor) during winter in some parts of its range. Mating occurs in July and August. Female construct a short (less than 1 m) long burrow in which to lay their solitary egg. Some females remain in the burrow until the egg hatches while others carry the egg in their pouch. When the mother leaves the burrow with the young inside, she seals the entrance. Juveniles generally emerge from September to November (Augee 2008).</p>



Photo: Short-beaked echidna. Source: E. Hancock

Fork-tailed swift (*Apus pacificus*)

EPBC Act status	Migratory
NC Act status	Special least concern
Likelihood of occurrence	Known
Species description	<p>18-21 cm body length 30-40 g</p> <p>Species is characterised by a long and deeply forked tail. It is a medium-sized Swift, with a slim body and long scythe-shaped wings that taper to a fine point.</p> <p>The body, tail and upper wings are black-brown, and it has a white band across the rump, in addition to a white patch on the chin and throat (Higgins 1999).</p>
Habitat within the site	Fork-tailed swifts have only been observed aerially and none were observed roosting across the project site.
Relevant biology / ecology	In Australia, fork-tailed swifts are believed to be exclusively aerial, flying at heights up to 1,000 m above the ground and roosting on the wing (DoE 2015). The species migrates to Australia in October and November and departs in April to breed in east Asia (DoE 2015). Fork-tailed swifts occur mostly over inland plains, but are also seen above vegetated areas, coastal habitats and urban environments, where they forage ahead of storm fronts to feed on aerial insects (DCCEEW 2023b).



Photo: Fork-tailed swift. Source: Sandy Horne, via Atlas of Living Australia

Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	28/11/2024	Tarong West Wind Farm Fauna Management Plan	Meghan Castelli, Ecologist	Dr Natalie Toon, Principal Ecologist	Leigh Knight, principal Environmental Planner
01	13/05/2025	Tarong West Wind Farm Fauna Management Plan.R1	Diane Lanyon, Director of Strategic Partnerships	Heather Richards, Senior Environmental Scientist	
02	20/08/2025	Tarong West Wind Farm Fauna Management Plan.R2	Diane Lanyon, Director of Strategic Partnerships	Tanya Fountain, Senior Restoration Ecologist	

Distribution List

Copy #	Date	Type	Issued to	Name
1	28/11/2024	Electronic	Tarong West Project Co Pty Ltd	Toby Coates
1	13/05/2025	Electronic	Tarong West Project Co Pty Ltd	Toby Coates
1	20/08/2025	Electronic	Tarong West Project Co Pty Ltd	Toby Coates

Citation: Ecosure, 2025, *Fauna Management Plan for Tarong West Wind Farm, Ironpot, Queensland.R7*. Report to Tarong West Project Co Pty Ltd. Brisbane

Report compiled by Ecosure Pty Ltd

ABN: 63 106 067 976

admin@ecosure.com.au

www.ecosure.com.au

Brisbane

PO Box 675
Fortitude Valley QLD 4006
P 07 3606 1030

Gold Coast

PO Box 2034
Burleigh Waters QLD 4220
P 07 5508 2046

Sydney

PO Box 880
Surry Hills NSW 2010
P 1300 112 021

Coffs Harbour

PO Box 4370
Coffs Harbour Jetty NSW 2450
P 02 5621 8103

Rockhampton

PO Box 235
Rockhampton QLD 4700
P 07 4994 1000

Townsville

PO Box 2335
Townsville QLD 4810
P 1300 112 021

Gladstone

PO Box 5420
Gladstone QLD 4720
P 07 4994 1000

Sunshine Coast

PO Box 1457
Noosaville QLD 4566
P 07 5357 6019



© Ecosure Proprietary Limited 2025

Commercial in confidence. The information contained in this document produced by Ecosure Pty Ltd is solely for the use of the Client identified on the cover sheet for the purpose for which it has been prepared and Ecosure Pty Ltd undertakes no duty to or accepts any responsibility to any third party who may rely upon this document. All rights reserved. No section or element of this document may be removed from this document, reproduced, electronically stored or transmitted in any form without the written permission of Ecosure Pty Ltd.