Prepared for
Tarong West Project Co Pty Ltd
ABN: 81 679 081 040

AECOM

Public Environment Report

Tarong West Wind Farm

22-Aug-2025
EPBC 2023/09643

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Acronym List

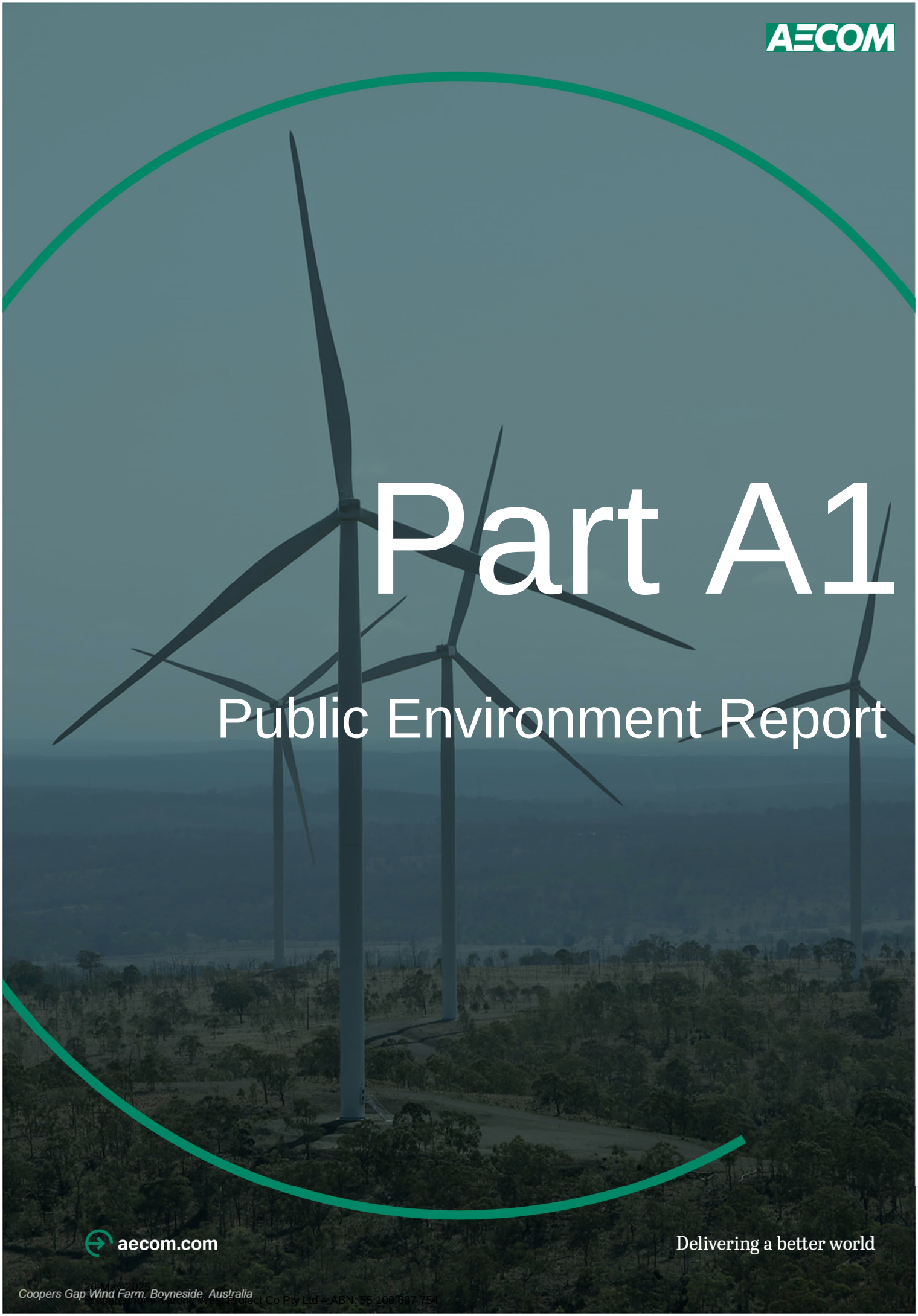
Acronym	Term
ABN	Australian Business Number
ABS	Australian Bureau of Statistics
ACH Act	*Aboriginal Cultural Heritage Act 2003*
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHPAC	Auburn Hawkwood People Aboriginal Corporation
AKHT	Ancillary Koala Habitat Tree
ALA	Atlas of Living Australia
AS	Australian Standard
ASS	Acid Sulfate Soils
BACI	Before-After-Control-Impact
BBMP	Bird and Bat Management Plan
BBUS	Bird and Bat Utilisation Survey
BESS	Battery Energy Storage System
BMP	Bushfire Management Plan
BoM	Bureau of Meteorology
BPESC	Best Practice Erosion and Sediment Control
CAMBA	China-Australia Migratory Bird Agreement
CBF	Community Benefit Fund
CCC	Community Consultative Committee
CCGT	Combined Cycle Gas Turbine
CE	Critically Endangered
CEC	Clean Energy Council
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Conservation of Migratory Species
CRI	Collision Risk Index
CRM	Collision Risk Model
DA	Development Application
DAF	Department of Agriculture and Fisheries
DAWE	Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP	Department of Environment and Heritage Protection
DES	Department of Environment and Science

Acronym	Term
DETSI	Queensland Department of Environment, Tourism, Science and Innovation
DEWHA	Department of the Environment, Water, Heritage and the Arts
DLGWV	Department of Local Government, Water and Volunteers
DMP	Decommissioning Management Plan
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development
DPI	Department of Primary Industries
DSDIP	Department of State Development, Infrastructure and Planning
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
DTMR	Department of Transport and Main Roads
E	Endangered
EA	Environmental Authority
EMI	Electromagnetic Interference
EMP	Environmental Management Plan
EMS	Environmental Management System
EODMP	End of Operational Decommissioning Management Plan
EOP	EPBC Act Environmental Offset Policy 2012
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
ERA	Environmentally Relevant Activity
ESCP	Erosion and Sediment Control Plan
EVNT	Endangered, Vulnerable or Near Threatened (under the NC Act)
FMP	Fauna Management Plan
FSC	Fauna Spotter Catcher
FTE	Full Time Equivalent
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning Service
GTDTHQ	Guide to Determining Terrestrial Habitat Quality
GW	Gigawatt
ha	Hectare
HBT	Hollow bearing trees
HVR	High Value Regrowth
IECA	International Erosion Control Associate
ISP	Integrated System Plan
JAMBA	Japan-Australia Migratory Bird Agreement
km	Kilometre
KPI	Key Performance Indicator

Acronym	Term
kV	Kilovolt
LC	Least concern
LGA	Local Government Area
LiDAR	Light Imaging Detection and Ranging
LIKT	Locally important koala tree
LVIA	Landscape and Visual Impact Assessment
m	Meters
MCU	Material Change of Use
Mi	Migratory
MLES	Matters of Local Environmental Significance
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheet
MSES	Matters of State Environmental Significance
MW	Megawatts
NBSAP	National Biodiversity Strategy and Action Plan
NC Act	*Nature Conservation Act 1992*
NEM	National Electricity Market
NHP	National Heritage Place
NSW	New South Wales
OAMP	Offset Area Management Plan
OCGT	Open Cycle Gas Turbine
OEH	Office of Environment and Heritage
Offsets Act	*Environmental Offsets Act 2014*
OHL	Overhead lines
OSOM	Over-Size/Over-Mass
OMS	Offset Management Strategy
OPW	Operational Works
PER	Public Environment Report
Planning Act	*Planning Act 2016*
Planning Scheme	*South Burnett Regional Council Planning Scheme 2017*
PMST	Protected Matters Search Tool
Proponent	Tarong West Project Co Pty Ltd
PO	Performance Outcome
QEJP	Queensland Energy and Jobs Plan
QETCL	Queensland Electricity Transmission Corporation Limited
QFES	Queensland Fire and Emergency Services
QLD	Queensland

Acronym	Term
QRET	Queensland Renewable Energy Target
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystem
RES Australia	RES Australia Pty Ltd
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
RHDV	Rabbit Haemorrhagic Disease Virus
RMP	Rehabilitation Management Plan
RNTBC	Registered Native Title Bodies Corporate
RSA	Rotor Swept Area
SARA	State Assessment and Referral Agency
SAT	Spot Assessment Technique
SBRC	South Burnett Regional Council
SBS	RES Neighbour Shared Benefit Scheme
SDAP	State Development Assessment Provisions
SEQ	South East Queensland
SEQERF	South East Queensland Ecological Restoration Framework Manual
SEVT	Semi-evergreen vine thickets
SIA	Significant Impact Assessment
SLATS	Statewide Landcover and Trees Study
SLC	Special Least Concern
SMP	Species Management Program
SPRAT	Species Profile and Threats
SRI	Significant Residual Impact
SSPO	Site Stabilisation Plan-Operations
TEC	Threatened Ecological Community
TMR	Transport and Main Roads
TNT	Threatened (Critically Endangered, Endangered or Vulnerable) and Near Threatened
TPZ	Tree Protection Zone
TUFLOW	Two-dimensional Unsteady FLOW
TWPER	Tarong West Public Environment Report
TWWF	Tarong West Wind Farm (The Project)
UG	Underground
UNESCO	United Nations Educational, Scientific and Cultural Organization
USDA	United States Department of Agriculture
V	Vulnerable
VHC	Vegetation Hazard Class

Acronym	Term
VM Act	*Vegetation Management Act 1999*
VMP	Vegetation Management Plan
WoNS	Weed of National Significance
WTG	Wing Turbine Generator
WWNTAC	Wakka Wakka Native Title Aboriginal Corporation



Part A1

Public Environment Report

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26 May 2025

Coopers Gap Wind Farm, Boyneside, Australia

Prepared for - Stanwell West Project Co Pty Ltd – ABN: 55 108 637 754

Public Environment Report

Tarong West Wind Farm

Client: Tarong West Project Co Pty Ltd

ABN: 81 679 081 040

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Executive summary

Executive summary

This Public Environment Report (PER) has been prepared for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to assess the potential impacts of the Tarong West Wind Farm (the Project) on Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The PER has been prepared on behalf of Tarong West Project Co Pty Ltd (the Proponent).

The Proponent

The Proponent is a wholly owned subsidiary of RES Australia Pty Ltd (RES Australia), part of the world's largest independent renewable energy company, bringing overseas credentials and more than 20 years' development excellence in Australia. Throughout Australia, RES Australia is behind many significant renewable projects such as the Taralga Wind Farm in New South Wales, Murra Warra Wind Farm in Victoria and Dulacca Wind Farm in Queensland. In addition to delivering more than 200 wind farm projects worldwide, RES Australia holds expertise in delivering solar, energy storage and green hydrogen renewable energy solutions.

The Project

The Project will involve the construction, operation and decommissioning of a wind farm located in Ironpot, Queensland. Ironpot is situated approximately 25 kilometres (km) west of Kingaroy, 85 km east of Chinchilla and 170 km northwest of Brisbane. The wind farm will comprise a maximum of 97 wind turbine generators (WTGs) with an overall rated capacity of up to 436.5 megawatts of clean and renewable electricity to supply to the National Electricity Market. In addition to the WTGs, the Project will include upgrades to existing roads and tracks, construction of new internal site access tracks and development of supporting infrastructure such as a site compound, substations, a switching station, electrical reticulation, an operations and maintenance facility, a batch plant, washdown area, borrow pits, meteorological masts and a helipad.

The Project will be established over freehold rural properties, State land and reserves, totalling approximately 17,500 hectares (ha) (the Project Site). The Project Site comprises the planning corridor (approximately 1,946 ha) which contains a clearing footprint (872 ha) for the proposed WTGs, hardstands, access tracks, underground cables, overhead lines and other associated infrastructure. Except for where permanent infrastructure is proposed, the balance of the Project Site will continue its existing cattle grazing use to provide habitat value for MNES. In the short, medium and long-term the overwhelming majority of the Project Site will be available for widespread wildlife utilisation.

As part of delivering the Project, the Proponent is committed to continually enacting opportunities to reduce the footprint of the wind farm whilst maintaining a safe, stable and non-polluting landform. This has occurred concurrent with the preparation of this Public Environment Report, and results in a reduced clearing footprint, approximately 18% or 190 ha smaller than the layout contemplated in the EPBC Act referral in November 2023. These changes are discussed further below.

The Project Site

The Project Site is dominated by domestic stock grazing on a mixture of semi-cleared pasture and native vegetation. Historical aerial imagery available indicates the broader Ironpot area was cleared prior to 1951 (QImagery, https://qimagery.information.qld.gov.au/). Since this time, the area has been subject to various agricultural production intensities and vegetation communities have regenerated in some areas as a result of natural regeneration or assisted regeneration.

Alongside agricultural production, activities related to energy generation have also been established throughout the region. This includes the Tarong Power Station (coal fuel) which commenced operations in 1984 and within the last 20 years, wind farms and solar farms. Wind farms in close vicinity to the Project Site are Coopers Gap Wind Farm (operational) (south) and Wambo Wind Farm (under construction) (south-west).

Under the South Burnett Regional Planning Scheme, the Project Site is zoned as rural which seeks to accommodate relevant activities such as cropping, intensive horticulture, animal industries and animal keeping. The existing use aligns with the intent of the zone as it accommodates rural activities (primarily livestock grazing).

To facilitate the Project, State planning approvals are required, these were granted on 25 July 2024. The State planning approvals include:

- Development permit for a Material Change of Use for a Wind Farm.
- Development permit for Operational Work for Clearing Native Vegetation.

The Proponent will maintain the objective whereby the construction, operation and decommissioning of the Project will not undermine the rural zone intent of the area and will co-exist with current rural activities.

Referral and Project changes

The Project was referred for assessment under the EPBC Act (EPBC 2023/09643) and the public were able to comment on the Project from 6 to 20 November 2023. On 4 December 2023, DCCEEW published the referral decision confirming that assessment under the EPBC Act was required via PER.

Since the referral decision, the Project has undergone minor changes, some of which affect the layout. These relate to the progression of Project design and are considered typical outcomes. The changes include the following:

- Overall clearing footprint reduction of 190 ha avoiding impacts to habitat for MNES.
- Reconfiguration of the main site entrance to provide safe ingress and egress throughout both construction and operation phases.
- Relocation of four WTGs and associated infrastructure (e.g. access track, underground cable, clearing footprint and planning corridor). WTGs 23, 26, 109 and 112 have been replaced with WTG's 52, 79, 104 and 121 to assist with turbine structural loading constraints and MNES habitat disturbance reduction.
- Relocation of northern substation.
- Relocation of proposed borrow pits to three (3) revised locations (adjacent to T27, T73 and T89).
- Removal of battery energy storage system from the Project.
- Inclusion of a proposed helipad to comply with Powerlink requirements (adjacent to the Powerlink switching station).
- Reduced number of construction laydown areas from seven (7) to four (4).
- Revised layout at the main facilities area on land parcel 29BO243.

Overall, the changes result in a significant reduction in total disturbance area particularly relating to MNES habitat and categorised remnant vegetation and a gain in overall efficiencies relating to Project implementation. These changes are typical of such projects in the planning and design phase as they move closer to the scheduled commencement however the Proponent has attempted to minimise and reduce the disturbance area of the Project wherever possible as the design progresses.

These changes came about from continued Project design and development, landholder discussions and, in a minor way, technological advancements.

State approval

In July 2024 the Queensland Government granted approval for a Material Change of Use (MCU) and Operational Works Permit for the Project in accordance with the *Planning Act 2016* (Qld) and Planning Regulation 2017. The approval represents a significant milestone for the Project as it progresses towards garnering all approvals in support of commencing construction in mid-2025.

The development approval granted by the State placed a significant post-approval framework of assessment, reporting, monitoring and management on the Proponent over the whole life of the Project. Specific requirements include:

- Carrying out the development generally in accordance with the proposal plan.
- Provide Registered Professional Engineer of Queensland-certified as-constructed drawings for permanent infrastructure.
- Multiple assessments with conditioned implementation requirements, including (but not limited to):
  - Aviation Impact Assessment
  - Wind Monitoring Tower Management Plan/Meteorology Masts Marking Plan
  - Pre-construction and post-construction assessments of television and radio reception strength
  - Electromagnetic Interference report
  - Vegetation and Fauna Management Plan
  - Rehabilitation Management Plan
  - Cleared Vegetation Management Plan
  - Bird and Bat Management Plan
  - Bird utilisation survey and first-year post-construction report
  - Stormwater Management Plan
  - Erosion and Sediment Control Plan
  - Site Stabilisation Plan – Operations
  - Construction Environmental Management Plan
  - Bushfire Management Plan
  - Safety and Emergency Management Plan
  - Noise Impact Assessment, Noise Monitoring Plan and Operational Noise Strategy
  - Traffic Impact Assessment and Traffic Management Plan
  - End of Construction Decommissioning Management Plan and End of Operation Decommissioning Management Plan
  - Complaint Investigation and Response Plan.
- Requirements to publish documents on the Project website.
- Maintaining accurate and complete compliance records.
- Prepare an Annual Compliance Report that includes:
  - accurate and complete details of compliance and any non-compliance with the condition and the plans
  - details of rectification actions for non-compliances that are identified within the report
  - a schedule of all management plans relevant to the development approval and accurate details of how each plan is being prepared and/or implemented.
- Publish the Annual Compliance Report on the Project website.
- Notification and corrective actions relating to non-compliances.

Undoubtedly the development approval granted by the Queensland Government has applied a stringent set of conditions to ensure the Project is delivered in a manner that is commensurate with community expectations and reduces the likelihood of adverse impacts. In particular, the conditions pertaining to compliance reporting are near identical to compliance conditions typically found in EPBC Act approvals.

Therefore, DCCEEW can be confident that the Project will be implemented as approved and with appropriate control strategies in place for the duration of the Project.

Consultation

The Proponent has maintained a genuine community presence since May 2022, with Agency and Council consultation, along with ongoing community and stakeholder engagement to build relationships with near neighbours and key stakeholders in relation to the Project, since late 2019. These efforts have provided additional benefits relating to Project design and development. The Proponent has led all engagement activities, with the objective that stakeholders and communities have direct interaction with the Proponent and that the Proponent can listen to stakeholders and members of the community feedback firsthand.

This approach streamlines the consultation program and utilises a common approach to engagement, aiming to:

- Ensure the development and implementation of engagement that is transparent and provides clear and consistent information on the Project.
- Reduce social risks associated with the Project, including stakeholder confusion or consultation fatigue.
- Establish and develop trust with key stakeholders.
- Afford the opportunity for meaningful participation in the assessment phases for the Project.

Separate to community consultation activities, regulator consultation has, and will continue to be, undertaken with the following local, state and federal departments and agencies:

- Department of Climate Change, Energy, the Environment and Water
- State Assessment and Referral Agency
- Department of State Development, Infrastructure and Planning
- Department of Environment, Tourism and Science and Innovation
- Department of Local Government, Water and Volunteers
- Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development
- Department of Primary Industries
- Department of Transport and Main Roads
- South Burnett Regional Council
- Western Downs Regional Council
- Civil Aviation and Safety Authority
- Regional Development Australia
- Australian Energy Infrastructure Commissioner
- Australian Energy Market Operator
- Emergency service departments
- Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism.

During consultation activities, concerns raised were documented and have since been actioned. The following has taken place in response to the concerns raised:

- Background noise monitoring at nearby receptors (ongoing) (additional to State DA approval requirement).
- Baseline dust monitoring in the Project surrounds (a direct follow on from the local community voicing concerns on this topic at information sessions).
- Establishing the Community Consultative Committee where representatives of the community and members of the Project team meet each quarter with to discuss Project updates and key concerns.

The Community Consultative Committee encourages centralised communication between the Project personnel and community members during latter stage development and throughout construction phases. More information on consultation and specifically consultation to date is provided in Section 1.5.

Throughout Project development, the Proponent has actively contributed to the local community by supporting various organisations and initiatives, including schools, sports clubs, community halls, and other groups. This support will continue throughout the remainder of the development phase, the construction phase and operation phase.

Assessment of Matters of National Environmental Significance

The Proponent will carry out the Project with a self-imposed objective to ensure that the construction, operation, and decommissioning phases do not undermine the rural zoning intent of the area and will coexist with ongoing rural activities. Ecological assessment work has included:

- targeted ecological surveys between 2018 and 2024
- habitat modelling and verification
- preparation and ready to implement management plans, including:
  - Vegetation Management Plan
  - Fauna Management Plan
  - Bird and Bat Management Plan.

Values

The clearing footprint (872 ha) within the Project site is predominantly non-remnant vegetation (78%). However, a significant portion of the field-verified remnant vegetation (1%) and high-value regrowth vegetation (21%) is in average to good condition. These areas offer various fauna habitat values, including hollows, seasonal nectar resources, and rocky outcrops.

This MNES assessment identified eight EPBC Act-listed fauna species confirmed or likely to occur within the Project Site:

1. koala (*Phascolarctos cinereus*)
2. fork-tailed swift (*Apus pacificus)*
3. greater glider (*Petauroides volans*)
4. grey-headed flying-fox (*Pteropus poliocephalus*)
5. glossy black-cockatoo (*Calyptorhynchus lathami lathami*)
6. white-throated needletail (*Hirundapus caudacutus*)
7. wandering peppercress (*Lepidium peregrinum*)
8. Austral toadflax (*Thesium austral*)
9. Austral cornflower (*Leuzea australis syn. Rhaponticum australe*).

These species have been investigated through a desktop assessment and detailed targeted field surveys. Following survey and analysis, it was concluded that no significant impact on the following species was likely:

- grey-headed flying-fox (*Pteropus poliocephalus*)
- glossy black-cockatoo (*Calyptorhynchus lathami lathami*)
- wandering peppercress(*Lepidium peregrinum*)
- Austral toadflax (*Thesium australe*)
- Austral cornflower (*Leuzea australis syn. Rhaponticum australe*) (due to species no longer a MNES).

Recent surveys for koala and greater glider (in 2024) were undertaken and revised modelling of habitat developed which considered:

- Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022a).
- Identifying habitat for the endangered koala (DCCEEW, 2024).
- A review of koala habitat assessment criteria and methods (Youngentob et al., 2021).
- National recovery Plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE, 2022b).
- Conservation Advice for *Petauroides volans* (greater glider (southern and central)) (DCCEEW, 2022).
- Guide to greater glider habitat in Queensland (Eyre et al., 2022).

Impacts and controls

Impacts to all MNES have been minimised through careful design. Various turbine layouts, planning corridors, and clearing footprints were considered to reduce impacts on remnant and high-value regrowth vegetation, which provide essential flora and fauna habitats. Impacts to semi-evergreen vine thickets of the Brigalow Belt and Nandewar Bioregions have been entirely avoided.

Potential impacts on species have been assessed as per the relevant guidelines. The 2024 fieldwork resulted in a revised assessment of preferred, general and dispersal habitat for koala across the Project Site (refer Table 1). These results represent a reduced area of preferred and general habitat likely to be impacted for koala. However, the significant impact assessment (SIA) for this species, that concluded a significant impact is likely, remains unchanged from the referral.

Table 1 Modelled koala habitat and impacts (Ecosure, 2025d)

Habitat type	Project site area (ha)	Clearing footprint area (ha)
Preferred koala habitat	1,631.71	15.46
General koala habitat	4,088.72	115.2
Low general koala habitat	4321.01	139.86
Dispersal koala habitat	3370.89	347.16
Unsuitable habitat	4,083.87	254.19
Total	**17,496.23**	**871.87**

Following additional detailed surveys to identify preferred habitat and potential habitat for greater glider on-site, the two habitat types were modelled. Potential habitat includes areas of non-remnant and regrowth vegetation with trees which may provide future denning and foraging resources. This site-specific investigation identified that impacts to potential habitat may be in the order of 270.12 ha. The area of preferred habitat for greater glider impacted has been reduced by the detailed design, the

combined area of preferred habitat and potential habitat is considered habitat critical to the survival of the greater glider.

The presence of WTGs is likely to significantly impact the white-throated needletail by disrupting the migration or feeding behaviour of a substantial portion of the species and increasing the risk of collisions. The area of impact will be a maximum 15.46 ha.

The Project construction may directly impact ecological values through vegetation loss, habitat fragmentation, noise, light and unintentional wildlife harm. Indirect impacts include the spread of weeds, erosion, and dust generation.

Mitigation measures will follow a hierarchy: avoidance, minimisation, and mitigation. Infrastructure has been designed to reduce significant vegetation impacts at available opportunities, with ongoing monitoring for water quality, dust, and invasive species control as part of the environmental monitoring regime.

During operation, risks include bird and bat injuries from turbine blades, soil erosion, wildlife collisions, and the spread of invasive weeds. Noise, light emissions, and bushfire hazards will also be managed.

Despite mitigation, significant impacts on the white-throated needletail are likely, primarily due to potential turbine strikes. Measures to minimise these impacts are detailed in the Bird and Bat Management Plan.

The significant impacts on koala and greater glider are directly related to vegetation impacts, however the Project Site as a whole, will continue to provide habitat for these species alongside the renewable energy land use.

Offsets

To address any significant residual impacts after implementing all feasible mitigation measures, offsets will be provided. The Proponent has acquired adjacent property to meet offset requirements for threatened species and communities and undertaken habitat quality assessments to inform the design and detail of the offset delivered (refer Section 7). Project offsets will be legally secured in accordance with approval requirements and evidence will be published on the Proponent's website.

Greenhouse gas assessment

The greenhouse gas (GHG) assessment described and estimated the Scope 1 GHG emissions anticipated from the construction of the Project. Scope 2 emissions were not applicable to the Project.

Wind farms do not generate significant GHG emissions during their operation because they rely on wind, a renewable energy resource, to produce electricity. It is not expected that Scope 1 and Scope 2 operation phase emissions would be significant so they were not further assessed.

Additionally, the assessment provided an estimate of the reduction in direct GHG emissions once the Project becomes operational and estimated the time required for the Project to displace the Scope 1 emissions generated during construction.

The emissions inventory for the construction of the Project for this assessment was populated based on information provided by the Proponent. The two key sources of emissions during the construction phase were identified as land clearing and fuel combustion from construction vehicles. The estimated GHG emissions from these two activities are presented in Table 2.

Table 2 Summary of GHG emissions associated with the Project construction phase

Project activity	Scope	Total emissions (t CO_2-e)
Construction vehicles	1	33,866
Land clearing	1	249,499
Total Scope 1		**283,365**

The displacement period was estimated considering a variety of existing individual non-renewable energy sources and for the Queensland electricity grid as a whole, including the contribution from renewable energy providers. Overall, the determination of displacement period using the emissions

intensity for existing individual non-renewable energy sources was identified as the most relevant approach for addressing the PER Guidelines requirements. The assessment determined the displacement period could be as fast as three months or as slow as seven months.

Flooding

An estimate of the flood extent and levels during a range of scenarios (including climate change scenarios) was completed for the Project Site. The purpose of the assessment was to determine the potential inundation extents associated with design rainfall events at the site location, and to comment on the potential impacts that the Project may have on local flood conditions.

Flood depth, velocity and depth velocity product maps were produced for the 20%, 1% and 0.5% Annual Exceedance Probability (AEP) flood events at the Project Site. The flood mapping extended through the flood prone areas considered, which coincided with significant drainage paths within the planning corridor.

The flood hydrology was modelled using the rainfall-runoff program RORB. Hydraulic modelling was carried out using 2D TUFLOW models of the Project Site.

The flood results for all flood events indicates that across all modelled flood events the proposed infrastructure and turbine locations remain largely flood-free. Model results observed minor changes in flood levels in localised areas around creek crossings and access tracks.

Section 1.0 Project information

1.1 General Information

1.1.1 Purpose

This Public Environment Report (PER) provides information as required by the PER guidelines issued 22-Apr-2024 by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) to support the assessment of the Tarong West Wind Farm (the Project) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This includes an assessment of potential impacts on Matters of National Environmental Significance (MNES) known or considered likely to occur within the Project Site area or in association with the Project.

Presentation of PER

The main body of information is presented across Part A1 and Part A2 of the PER. The former comprises the main content and delivers the Project information in a streamlined, consolidated format. The latter, Part A2 comprises the PER figures. Depending on the information presented, each figure comprises up to 20 sheets. This approach ensures that related figures are grouped together to allow for ease of reference throughout the document and the Guide to providing maps and boundary data for EPBC Act projects (DCCEEW, 2021) is suitably utilised in accordance with the PER guidelines. Each 20-set figure series consists of one overview figure followed by 19 figures scaled at 1:15,000. The overview figure provides a broad spatial context for the area of interest, while the subsequent 1:15,000 scaled figures offer a more detailed view to improve legibility and ensure finer elements are visible and easily interpreted. This tiered approach allows for efficient navigation and review of the visual data, supporting accurate analysis and a clearer understanding of the information presented.

Part B of the PER comprises the appendices which presents the technical and administrative information, including the cross-reference table (refer Appendix A) detailing where the information requested in the PER Guidelines is presented in the PER. The third and last component is Part C and this comprises a copy of the referral documentation.

Technical reporting presented in Part B of the PER has been prepared alongside the design of the Project. The design has evolved in response to ongoing ecological assessment in an effort to avoid and reduce impacts to MNES. Mapping presented in earlier technical reporting is presented in Part B and Part C and is based on an earlier iteration of design, and therefore may not represent the current design information presented in the main body of the PER (Part A1 and Part A2).

1.1.2 The Proponent

The Proponent for the Tarong West Wind Farm is Tarong West Project Co Pty Ltd (the Proponent), a wholly owned subsidiary of RES Australia Pty Ltd. The Proponent's details are provided in Table 1-1.

Table 1--1 Proponent details

Name	Tarong West Project Co Pty Ltd
ABN	81 679 081 040
Contact	contact_us@tarongwestwindfarm.com.au Tel: 1800 118 737
Postal address	Level 6, 165 Walker St, North Sydney NSW 2060

1.1.3 Objectives of the Action

The Proponent seeks approval to undertake construction, operation and decommissioning of Tarong West Wind Farm (formerly known as Iron Leaf Wind Farm).

1.1.4 Location of the Action

The Project Site is located within the Wide Bay Burnett region, approximately 25 km west of Kingaroy, 85 km east of Chinchilla and 170 km northwest of Brisbane. The Project is wholly situated in the local government area (LGA) of South Burnett Regional Council and is in the suburb (i.e. locality) of Ironpot. The location is shown in Part A2 Figure 1-1.

The South Burnett region has a history of agricultural production. The region is dominated by rural land use and is characterised by pastoral properties used for livestock production. South Burnett is also known for peanut production, timber production and viticulture, as well as coal mining and electricity generation. Wind farms in close vicinity to the Project Site are Coopers Gap Wind Farm (operational) (south) and Wambo Wind Farm (under construction) (south-west).

1.1.5 Background to the development of the Action

The Project will involve the construction and operation of a wind farm consisting of up to 97 wind turbine generators with an overall rated capacity of up to 436.5 megawatts (MW) of clean and renewable electricity to supply to the National Electricity Market (NEM). The Project will be established over freehold rural properties, State land and reserves, totalling approximately 17,500 hectares (ha) (Project Site).

The Project Site comprises the planning corridor, a 1,946 ha subset which contains a clearing footprint (872 ha) for the proposed wind turbines, access tracks, underground cables, overhead lines and other associated infrastructure. Except where permanent infrastructure is proposed, the existing land will continue to be used for rural purposes such as grazing livestock and cropping.

Following approval of the Project, further detailed design will be completed to refine the exact location of the wind turbines and all other infrastructure within the Project Site (i.e. micro-siting). To accommodate on-site constraints, the wind turbines and ancillary infrastructure may move up to 100 metres (m) from the original proposed locations and within the planning corridor.

The Project is scheduled to start construction in late-2025. The Project is anticipated to be constructed as a single stage and be completed within 30 months (subject to detailed design, weather conditions and other external factors).

In this PER, content specific to MNES impacts and management (refer Sections 3 and 4) has been prepared with assistance and input from ecological impact assessment specialists Ecosure Pty Ltd.

1.1.6 Relationship with Other Actions

The Project has no relationship with other Proposed Actions. Nonetheless, several other EPBC Act referrals by unrelated parties have occurred in the vicinity of the Project across multiple industries. These include:

- EPBC 2003/1264 Surat Basin to Tarong Railway project, decided Not a Controlled Action on 15 December 2003
- EPBC 2007/3430 Coal Conveyor between New Acland Coal Mine and Tarong Power Stations, decided Not a Controlled Action on 25 May 2007
- EPBC 2008/4559 Coopers Gap Wind Farm, decided Not a Controlled Action on 24 November 2008
- EPBC 2011/5976 Development of the Coopers Gap Wind Farm, decided Not a Controlled Action on 29 July 2011
- EPBC 2015/7522 Improving rabbit biocontrol: releasing another strain of RHDV, decided Not a Controlled Action on 16 August 2016
- EPBC 2020/8727 Wambo Wind Farm, approved with conditions on 21 December 2021.

1.1.7 Current status

The Project was referred to DCCEEW for assessment under the EPBC Act in September 2023 and the public were provided an opportunity to comment on the proposed action for a ten business day period ending on 20 November 2023. The referral and assessment approach decisions were made on 4 December 2023 and stipulated that the proposed action is a controlled action and will be assessed by PER.

In July 2024, the Proponent obtained State approval (refer Section 1.4.1 for further details) and completed additional design work resulting in changes to the action since the referral documentation was submitted and published (refer Section 1.2.4).

Selected site-based activities are ongoing, concurrent with the EPBC Act assessment process, and do not form part of the Proposed Action. These are in addition to the existing pastoral operations and include:

- site investigation activities, including surveys (such as flora and fauna surveys and environmental data collection, geotechnical), water quality testing, installation of groundwater measuring bores, and surface water quality stations

- site investigations associated with cultural heritage management including test pitting and archaeological investigations
- site tours and inspections, including for community engagement purposes
- installation of temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on any protected matter
- other utilities and services not associated with the Proposed Action.

1.1.8 Consequences for not proceeding with the Action

The consequences for not proceeding with the Project are significant and multifaceted. A 'no action' scenario will result in long-term consequences contrary to reducing greenhouse gas emissions from electricity generation, achieving net zero and Queensland Renewable Energy Target (QRET) and broader environmental and economic goals.

Moreover, failing to act will continue reliance on carbon-intensive electricity generation, inadvertently leading to indirect impacts on MNES and undermining energy transition and Queensland's progress toward the QRET targets of 50% renewable energy by 2030, 70% by 2032, and 80% by 2035. While immediate impacts to MNES would be avoided, a 'no action' scenario does not represent a viable or sustainable option, as it compromises both environmental progress and socio-economic benefits.

1.2 Description of the Action

1.2.1 Project Site, Project footprint and staging

The Project Site has an area of approximately 17,500 ha and the footprint are quantified in Table 1-2. The planning corridor and clearing footprint have been subject to extensive refinement throughout the Project development process as opportunities to reduce impacts have arisen.

The assessment outlined in this PER considers the maximum anticipated clearing extent (i.e. within the planning corridor), with potential impacts expected to be reduced through design refinements and micro-siting of infrastructure within the planning corridor. Impact calculations are based on the areas of remnant and non-remnant vegetation within the clearing footprint.

The Project is currently anticipated to be constructed as a single stage.

Table 1-2 Project Site information

Jumma Road, Ironpot QLD	Total area (ha)
Project Site	Approximately 17,500 ha
Planning corridor	1,946 ha
Project clearing footprint	872 ha

The Project Site comprises various freehold properties, State land, stock route reserve (Table 1-3) and several road reserves (Table 1-4).

Table 1-3 Properties within the Project Site

Lot	Plan	Tenure	Area (ha)	Number of Turbines
4	RP890694	Freehold	922.98	4
5	BO330	Freehold	3,721.19	22
6	BO250	Freehold	2,355.45	14
7	RP890694	Freehold	971.60	4
10	SP168643	Freehold	1,924.15	6
29	BO243	Freehold	1,711.42	19
36	BO236	Freehold	1,982.99	12
43	FTZ37338	Freehold	72.84	0

Lot	Plan	Tenure	Area (ha)	Number of Turbines
44	SP345248	Reserve (Stock Route)	14.54	0
60	BO188	Freehold	509.43	2
62	BO188	Freehold	501.89	1
63	BO188	Freehold	507.04	1
64	BO190	Freehold	512.08	4
66	BO190	Freehold	412.34	1
67	BO490	Freehold	493.51	4
68	RP800291	Freehold	511.94	3
100	SP350189	State Land	11.04	0
		TOTAL	**17,136.43**	**97**

Table 1-4 Road reserves within Project Site (all roads local roads unless otherwise stated)

Road name	Adjoining lot/plan
Hodges Dip Road	Lot 4 RP890694
Kingaroy Burrandowan Road (State controlled road)	Lot 4 RP890694 and Lot 7 RP890694
Jumma Road	Lot 5 BO330, Lot 44 SP345248, Lot 60 BO188, Lot 62 BO188, Lot 63 BO188, Lot 29 BO243, Lot 10 SP168643
Greystonlea Jumma Road	Lot 7 RP890694, Lot 36 BO236, Lot 5 BO330 and Lot 6 BO250
Boyne River Road	Lot 62 BO188, Lot 63 BO188, Lot 64 BO190, Lot 65 BO190, Lot 66 BO190
Glenrocks Road	Lot 62 BO188
Red Tank Road	Lot 10 SP168643
Unnamed Road	Lot 63 BO188 and Lot 65 BO190
Ironpot Road	Lot 100 SP350189, Lot 6 BO250, Lot 29 BO243, Lot 10 SP168643, Lot 68 RP800291, Lot 66 BO190 and Lot 67 BO490
Total	**Approximately 363 ha**

1.2.2 Project components

The Project will supply up to 436.5 MW of clean and renewable energy to the National Electricity Market (NEM). To achieve this, the Project will consist of up to 97 wind turbine generators (WTGs) and hardstands, and ancillary infrastructure potentially including (subject to detailed design):

- site access and on-site access tracks, including widening sections of Ironpot Road
- one (1) site compound
- up to four (4) temporary laydown areas / stockpile areas
- two (2) 33 kilovolt (kV) to 275 kV substations
- one (1) 275 kV Powerlink switching station to connect to existing 275 kV overhead powerlines
- internal electrical reticulation consisting of overhead lines (OHL) and underground (UG) cabling
- one (1) permanent operations and maintenance facility including control centre, offices, workshop, warehouse, water tanks, septic systems and parking
- two (2) batch plant

- washdown areas (as required to comply with site biosecurity)
- up to three (3) borrow pits
- three (3) permanent and four (4) temporary meteorological masts
- helipad.

The four temporary wind monitoring masts are located at WTG locations. The temporary wind monitoring masts will be installed during the construction phase and decommissioned prior to the operations phase.

Part A2 Figure 1-2 outlines the proposed locations of the WTGs and required infrastructure. The layout has been extensively tailored to avoid, where possible, impacts on known environmental constraints.

1.2.3 Project phases

The Project is currently in the development phase. This involves work streams including community engagement, design and procurement, obtaining approvals, and the grid connection process as part of progressing towards the mobilisation and construction phases.

Once the relevant approvals are obtained, the Project will shift into the mobilisation and construction phase. The construction stage will occur over approximately 30 months.

The operations phase will commence in a sequenced manner and overlap with the latter part of the construction phase. Operations commence when construction is complete and all WTGs are generating power into the NEM.

The Rehabilitation Management Plan (RMP) (refer Appendix K), developed with guidance from the South East Queensland Ecological Restoration Framework Manual (SEQERF) and Ecosure's ecological reporting, outlines a strategy to rehabilitate impacted ecosystems based on agreements with landholders, vegetation types and regional ecosystem guidelines. Species selection for trees, shrubs, and ground cover will depend on nursery availability and final land use, with planting densities adjusted to account for potential failures. The rehabilitation program of works encompasses primary, follow-up, and maintenance phases to achieve a self-sustaining ecological system. Temporary work areas will be rehabilitated to safe, stable and non-polluting landforms as soon as practicable after construction and decommissioning.

At this point in time, the Project is scheduled to operate for at least 30 years. The decision to transition the Project from the operations phase to the decommissioning phase is scheduled to occur closer to the year 2058. Alternatively, the Project may remain operational or be repowered in accordance with approval requirements (e.g. renewals, extensions etc) that will be confirmed closer to that point in time.

Detailed elements of each phase are provided below.

1.2.3.1 Construction

For the construction of the Project, the following activities will generally occur:

- site establishment (temporary facilities, laydown areas, borrow pits, washdown areas, equipment and materials)
- clearing and fragmentation of vegetation that is habitat for threatened wildlife
- earthworks, rock crushing, paving (with gravel cap) and drainage for access tracks, roads and wind turbine hardstands
- excavation for the turbine foundations and ancillary infrastructure
- construction of up to 97 wind turbine foundations (bolt cage, reinforcement and concrete) via temporary on-site concrete batching plant)
- installation of overhead and underground electrical reticulation and communications cabling and equipment
- installation of three permanent and four temporary (during construction period only) meteorological masts, with removal of the temporary masts at the conclusion of construction

- installation of medium and high voltage substation infrastructure, including a 275kV Powerlink switching station to facilitate on-site connection to existing 275kV transmission line
- delivery of wind turbine components
- installation of up to 97 wind turbine generators, using large cranes
- commissioning and reliability testing of wind turbines
- biosecurity management (e.g. weeds and pests and washdown areas)
- erosion and sediment controls
- dust generation and management
- progressive rehabilitation and restoration of the works area where feasible.

1.2.3.2 Operation

The operational phase of the Project is expected to last at least 30 years after which further operation or decommissioning will occur.

Throughout the operational phase, maintenance works will be conducted as required and operational staff will be required both on-site and off-site.

General activity on-site during the operational phase will consist of:

- drainage maintenance/clearing
- access track maintenance
- substation maintenance
- mast maintenance
- turbine maintenance
- operation and maintenance facility access by wind farm staff
- repair of turbines or ancillary equipment as required.

1.2.3.3 Decommissioning

At the end of the operational life, the Project will be subject to decommissioning in accordance with permit conditions. Above-ground infrastructure will be dismantled and removed except for Powerlink-owned and operated high voltage infrastructure (refer Part A2 Figure 1-2) and sub-surface infrastructure situated 1 m or more below ground level. Where practical, access tracks and Project buildings (e.g. site warehouse) may be retained for future use by the landowner as part of ongoing agricultural use of the land or as part of local fire risk management strategy, dependent on agreements with individual landowners at the time.

The decommissioning will be undertaken with reference to the best practice processes relevant at that point in time. The dismantling of infrastructure will focus on re-purposing and recycling of componentry as much as practicable. Areas subject to ground disturbance during decommissioning will be subject to rehabilitation and stabilisation in accordance with all relevant approval requirements. For instance, the establishment of suitable pasture coverage in agreement with the landowner(s).

Where infrastructure is removed for replacement, there will again be a focus on re-purposing and recycling of componentry as far as practicable. Areas disturbed during the removal of unwanted componentry that will not form part of the footprint of the re-powered Project will be subject to rehabilitation and stabilisation.

The decommissioning phase is expected to last 24 months. General activity on-site during the decommissioning phase will consist of:

- preliminary planning and site mobilisation
- dismantling and demolition of turbines
- dismantling and demolition of substations
- dismantling and demolition of masts

- dismantling and demolition of operational areas including operation and maintenance facility
- cutting of electrical and data connections to a maximum of 1 m below ground level and covering foundations with soil
- preparation of components for transporting to a salvage vendor or a landfill in or near the Kingaroy area
- transporting of decommissioned components and equipment off-site
- remediation of all agreed areas with landowner
- remediation of all areas required for permit compliance
- site demobilisation.

A Decommissioning Management Plan (DMP) forms part of this PER (refer Appendix B). The explicit decommissioning methodology has not been finalised at this stage. However, in the event of decommissioning, the final methodology will be developed in accordance with the DMP. This approach allows flexibility to incorporate advancements in technology, updated processes, guidelines, and legislative requirements closer to the time of decommissioning. Importantly, it will align with relevant industry practices and prioritise the re-purposing and recycling of componentry wherever practicable.

Alternatively, planning, environmental approvals, and land agreements may be secured to support an extension of the life of the existing wind farm or ‘re-powering’ with updated turbine and generation infrastructure. This includes securing approval durations of up to 40 years to provide long-term operational certainty. Where the site is re-powered, existing access tracks, hardstands, connection infrastructure, and operational buildings will be utilised as far as practicable to reduce the construction term, gap in generation potential, and to minimise the environmental impacts that may reasonably result from the re-powering process.

1.2.4 Project changes since EPBC Act referral

Layout refinement is a typical part of the Project development process. Since the referral decision on 4 December 2023, the Project layout has been further refined as a result of both ongoing turbine loading assessments and overall environmental impact reduction. Key changes to the Project layout include the following:

- overall clearing footprint reduction of 190 ha avoiding impacts to habitat for MNES
- reconfiguration of the main site entrance to provide safe ingress and egress throughout both construction and operation phases (refer Part A2 Figure 1-3)
- relocation of four WTGs and associated infrastructure (e.g. access track, underground cable, clearing footprint and planning corridor). WTGs 23, 26, 109 and 112 have been replaced with WTGs 52, 79, 104 and 121 to assist with turbine structural loading constraints and MNES habitat disturbance reduction (refer Part A2 Figure 1-3)
- relocation of northern substation to mitigate reticulation losses that caused generator performance issues which were identified during detailed grid connection studies (refer Part A2 Figure 1-3)
- relocation of proposed borrow pits to three (3) revised locations (adjacent to T27, T73 and T89)
- removal of battery energy storage system from Project to reduce the overall size of the main facilities area, and as a result of detailed studies (refer Part A2 Figure 1-4)
- inclusion of a proposed helipad to comply with Powerlink requirements (adjacent to the Powerlink switching station (refer Part A2 Figure 1-4)
- reduced number of construction laydown areas from seven (7) to four (4)
- revised general arrangement at the main facilities area on land parcel 29BO243 (refer Part A2 Figure 1-4) (this includes updated design details to facilitate the cut-in of the existing Powerlink transmission line to the new Powerlink switching station, as a result of further design consultation with Powerlink)

- reduction of the planning corridor extent following on from the above changes which result in confirmed avoidance areas.

Overall, the changes result in a significant reduction in disturbance area when compared against the layout provided in the referral, particularly relating to MNES habitat and categorised remnant vegetation. These changes are a result of the design work ordinarily performed during the construction phase, that the Proponent has brought forward to the development phase. This design work ensures this PER presents a detailed proposed footprint balancing the requirements of the Project with the objective to reduce impact to MNES as far as practicable.

1.3 Feasible alternatives

1.3.1 Initial concept design

The Project initially included 151 WTGs in May 2020 with an area of 19,000 ha (i.e. the former Project Site). There have been several iterations of the Project's design since inception and Table 1-5 below summarises the key changes to the design from May 2020 to October 2024.

The changes include a reduction in the number of WTGs as well as the refinement of the Project Site area, clearing footprint and planning corridor all of which are the result of considerations including (but not limited to):

- feedback the community and key stakeholders, including feedback from regular community information sessions since May 2022
- minimising the overall ecological impact, particularly to MNES and remnant vegetation
- reducing the number of turbines to reduce the overall impact area
- reconfiguration of the site entrance to provide safer ingress and egress
- exceedance of required setbacks to sensitive receptors.

The changes in Project design have been informed by civil and electrical designs normally carried out during the construction phase, and the Proponent has brought forward this work to the development phase. These designs have allowed the Proponent to avoid and reduce impacts and minimise the clearing footprint with a high degree of confidence. The beneficial outcome is a higher level of impact avoidance and as such, a reduction in the ecological disturbance across the site considerably.

Ecological impacts are discussed further in Section 4.

1.3.2 No Action

As part of transforming Queensland's energy system, the Queensland Government has set the QRET and is committed to achieving them (Department of Energy and Climate, 2024). These targets are 50% renewable energy by 2030; 70% renewable energy by 2032; and 80% renewable energy by 2035.

For the twelve months ending July 2024, 27.4% of the State's energy generation was renewable energy and on track to meet the future targets (Department of Energy and Climate, 2024). The Project will make a significant contribution towards achieving the targets.

Table 1-5 Summary of Project design

Design Period	No. of WTGs	Project Site (ha)	Planning corridor (ha)	Proposed clearing footprint (impact area (ha))	Comments
May 2020	151	19,000	N/A	1,965	Early development layout.
May 2022	128	17,496	N/A	1,615	Infrastructure layout refined based on reduction of WTGs. Site boundary changed to exclude large areas of remnant vegetation from the Project Site and areas of high glider prevalence along the Kingaroy Burrandowan Road (37 glider sightings occurred in vegetation adjacent to the Project Site area along Kingaroy Burrandowan Road and in properties now excluded from the Project Site, in habitat identical to that occurring in the site).
July 2023	97	17,496	N/A	1,062	Infrastructure refined based on reduction of WTGs and a reduced clearing footprint. Minimising impacts to areas of remnant vegetation and modelled fauna habitat, particularly koala habitat which reduced by approximately 50% since initial design.
October 2024	97	17,496	1,990	872	Refined location of WTGs, access tracks and supporting infrastructure following 30% design details. Removal of BESS. Reduced clearing footprint, minimising clearing impacts to remnant vegetation and non-remnant woodland areas.
April 2025	97	17,496	1,946	872	Reduced planning corridor to reflect land no longer subject to potential or confirmed impacts.

The Queensland Energy and Jobs Plan (QEJP) (DES, 2022) highlights the interdependency of delivering new sources of renewable energy and job creation. Only with both supported by all levels of government and projects such as this proposed action, can the QEJP be successfully achieved.

Nationally, the Australian Government has set emissions reduction targets of 43% below 2005 levels by 2030 and net zero by 2050. Furthermore, the Australian Government is targeting 82% renewable energy in our electricity grids by 2030. The Project will directly support the achievement of these targets.

If there was 'no action', there would be an avoidance of impacts to MNES in the short-term. However, this would be accompanied by a longer-term range of impacts including the risk of the Australian Government emission reduction targets, renewable energy target, QRET and the QEJP not being achieved:

- No replacement of carbon emissions from equivalent electricity generation saving almost one million tonnes of CO_2 per annum (refer to Greenhouse Gas Assessment, 2024).
- No generation of up to 170 direct full time equivalent (FTE) jobs during the construction phase and approximately 270 indirect FTE jobs locally and in the wider economy.
- No generation of up to 47 direct and indirect FTE jobs during operation and maintenance of the wind farm.
- No establishment of a community fund that would have contributed over $10 million to the community through a range of proposed benefit sharing programs over the life of the Project.
- No diversified revenue to farms involved in the Project as host landholders.

It is likely 'no action' will contribute to continued utilisation of carbon-dioxide generating electricity and inadvertently lead to indirect impacts on MNES (through climate change), therefore it does not genuinely represent a nil impact option, as it would forgo the significant environmental benefits associated with transitioning to renewable energy, such as reducing GHG emissions and supporting biodiversity through mitigating impacts.

1.4 Other approvals

Once the EPBC Act approval for impacts to MNES is granted, there are additional primary and secondary approvals that may be required prior to and during the Project construction and operation under Commonwealth, State, Local legislation. These approvals can be progressed during design and/or by the construction contractor, depending on timeframes.

1.4.1 Queensland State Planning Act 2016

Under Schedule 2 of the *Planning Act 2016* (Planning Act), the Project is defined as a 'material change of use' and 'operational work', being:

- material change of use, of premises, means, the start of a new use of the premises.
  - Project relevance: construction and operation of a new wind farm.
- operational work means work, other than building work or plumbing or drainage work, in, on, over or under premises that materially affects premises or the use of premises.
  - Project relevance: clearing vegetation to accommodate wind turbines and ancillary infrastructure.

On 25 July 2024, the Queensland Government granted the material change of use and operational work development permits (reference: 2402-39136-SDA). The approval and supporting assessment material can be viewed and downloaded from the State planning portal(https://www.planning.qld.gov.au/planning-framework/state-assessment-and-referral-agency/sara-application-material).

The approval conditions provide a detailed framework for the Project to manage potential and actual impacts on the environment and community. In summary, there are 38 conditions, and the Proponent is required to:

- carry out the development generally in accordance with the proposal plan
- prepare as constructed plans for Registered Professional Engineer of Queensland or licensed surveyor certification
- complete and implement air safety assessments and management plans
- appropriately manage telecommunications including television and radio reception strength and electromagnetic interference
- appropriately manage shadow flicker
- prepare and implement a Vegetation and Fauna Management Plan
- prepare and implement a Rehabilitation Management Plan
- prepare and implement a Bird and Bat Management Plan
- prepare and implement a Cleared Vegetation Management Plan manage water quality and drainage including the preparation and implementation of Stormwater Management Plan, Erosion and Sediment Control Plan, and Site Stabilisation Plan – Operations
- prepare and implement a Construction Environmental Management Plan, Bushfire Management Plan, and Safety and Emergency Management Plan as part of managing construction and site safety
- prepare a Noise Impact Assessment and Noise Monitoring Plan, then undertake noise monitoring in accordance with the plan
- prepare an Operational Noise Strategy and operate the wind farm in accordance with the strategy
- prepare a Traffic Impact Assessment and Traffic Management Plan and carry out the development in accordance with the latter
- prepare decommissioning management plans for the end of construction and end of operation milestones
- establish a complaint management framework with investigation and reporting obligations
- deliver an offset to counterbalance the impact on 5.4 ha of regional ecosystem 11.12.3/11.7.6
- publish the State planning approval (i.e. decision notice) and maintain accurate and complete compliance records at all times
- prepare and publish an annual compliance report documenting compliance and non-compliance, rectification actions for identified non-compliances and status of management plans, including implementation
- maintain the publication of compliance reports and required management plans on the Project website for the operational life of the Project
- notify the State planning department of an identified non-compliance within 5 business days of becoming aware of the non-compliance and detail the associated investigation and corrective actions.

Assuring early implementation, each listed deliverable specifies timing requirements ranging from *prior to the commencement of construction* to *at all times*. The approval conditions deliver certainty to other stakeholders, including DCCEEW, on how the Project will be overseen by the State planning department for the life of the Project. A copy of the decision notice is provided in Appendix C.

There are submission requirements for each deliverable required under the State planning approval, and this requires the Proponent to submit relevant documentation to Air Services Australia, South Burnett Regional Council, the State planning department, Bureau of Meteorology, Energy Queensland, Queensland Fire and Emergency Services, relevant local governments between port and the Project area, relevant port authorities, relevant railway managers, and the State transport and main roads department. This list of relevant parties combined with the ongoing reporting obligations illustrates the

comprehensive management framework that the State requires the Proponent to maintain for the life of the Project.

Overall, the approval conditions attached to the State planning department's decision notice are rigorous and stringent. For this Project, there is an opportunity for any subsequent approval to avoid duplication of existing approval conditions where there will be no material benefit to the administering authority, the Proponent or the general public.

Other approvals that may be required for the Project in accordance with Schedule 10 of the Planning Regulation 2017 include:

- development permit for operational work for waterway barrier works (Schedule 10, Part 6, Division 4, Subdivision 1, Section 12) for the establishment of any structures that limit fish movement along the mapped Queensland waterways for waterway barrier works waterways over the site (i.e. bed level crossings, culverts, silt curtains), unless accepted development requirements apply.
- development permit for operational work that involves taking or interfering with water (Schedule 10, Part 19, Division 1, Subdivision 1, Section 29) (i.e. pumps, diverting water).
- operational works permit under the Planning Act, for excavation and filling
- Environmental Authorities under the *Environmental Protection Act 1994* for:
    - 16(2b) – extracting, in a year, more than 100,000 t but less than 1,000,000 t
    - 16(3b) – screening, in a year, more than 100,000 t but less than 1,000,000 t.

1.4.2 Environmental Offsets Act 2014

The *Environmental Offsets Act 2014* (Offsets Act) aims to counterbalance significant residual impacts of particular activities on prescribed environmental matters through the use of environmental offsets.

An environmental offset may be required as a condition of approval where, following consideration of avoidance and mitigation measures, if the activity is likely to result in a significant residual impact on prescribed environmental matters.

Prescribed environmental matters include:

- MNES
- Matters of State Environmental Significance (MSES)
- Matters of Local Environmental Significance (MLES).

Once the administering authority has decided that a prescribed activity is required to provide an offset, the offset is required to be delivered in accordance with the Offsets Act under the conditions of the Development Approval, Environmental Offsets Regulation 2014 and the Queensland Environmental Offsets Policy.

The approval granted under the Planning Act requires the Proponent to deliver an offset for impacts to 5.4 ha of Regional Ecosystem (RE) 11.12.3/11.7.6 prior to commencing works in this vegetation community.

1.4.3 Vegetation Management Act 1999

A Relevant Purpose Determination is required under Section 22A of the *Vegetation Management Act 1999* (VM Act) for development applications that involve the clearing of native vegetation.

Relevant Purpose Determinations for the Project have been obtained in order to facilitate lodgement of development applications and obtaining approvals. Any additional clearing (i.e. clearing to widen roads/intersections along access route) that cannot comply with accepted development requirements may require a further 22A determination.

1.4.4 Nature Conservation Act 1992

A Species Management Program (SMP) is required for activities impacting breeding places of protected animals classified as extinct in the wild, critically endangered, endangered, vulnerable, near threatened,

special least concern, colonial breeder or least concern under the *Nature Conservation Act 1992* (NC Act).

Where the Project falls within a 'high risk area' and clearing is proposed, a Protected Plants Survey undertaken by a certified botanist is required to determine the actual presence of threatened plants. If protected plants are identified as a result of the Protected Plants Survey, a Protected Plants Clearing Permit is required prior to clearing.

1.4.5 Water Act 2000

Riverine protection permits may be required under the *Water Act 2000* prior to works to excavate; place fill; or destroy native vegetation in any watercourse, lake or spring, unless exemption requirements are met.

1.4.6 Fisheries Act 1994

Constructing or raising waterway barrier works within an assessable waterway per Schedule 10, Part 6, Division 4, Section 12 of the Planning Regulation 2017 will require a Development Permit for Operational Works – Waterway Barrier Works.

1.4.7 Transport Infrastructure Act 1994

A Traffic Impact Assessment and Traffic Management Plan will be developed in accordance with the approval granted under the Planning Act. Access approvals and/or licences are also required and will be sought at a later stage. These approvals may include Sections 33 and 62 approvals under the *Transport Infrastructure Act 1994*.

1.4.8 South Burnett Regional Council Planning Scheme and Local Laws

Despite the Planning Regulation exempting the wind farm from being assessable development under the South Burnett Regional Council Planning Scheme 2017 (Planning scheme), secondary approvals may be required. These secondary approvals may include:

- development permit for reconfiguring a lot (for the Purpose of a Lease) for the establishment of a lease for more than 10 years
- development permit for a material change of use (high impact industry) for the establishment of a concrete batching plant(s)
- development permit for a material change of use (extractive industry) for the establishment of a quarry (or borrow pit)
- development permit for operational works (earthworks) for filling and excavation over the site.

1.5 Consultation

1.5.1 Consultation approach

The Proponent has undertaken ongoing community and stakeholder engagement to build relationships with near neighbours and key stakeholders in relation to the Project as well as to inform Project design and development. The Proponent has led all engagement activities, with the objective that stakeholders and communities have direct interaction with the Proponent and that the Proponent can listen to stakeholders and members of the community feedback firsthand.

This approach streamlines the consultation program and utilises a common approach to engagement, aiming to:

- ensure the development and implementation of engagement that is transparent and provides clear and consistent information on the Project
- reduce social risks associated with the Project, including stakeholder confusion or consultation fatigue
- establish and develop trust with key stakeholders
- afford the opportunity for meaningful participation in the assessment phases for the Project.

1.5.2 Identification of relevant parties

Stakeholders are identified in Table 1-6 below.

Table 1-6 Stakeholders

Stakeholder group	Stakeholder
Landowners	Landowners with the potential to host infrastructure
Neighbours	Neighbouring dwellings within a 5 km radius of a potential turbine location
Community	Community members who live outside the 5 km radius of a potential turbine site but generally within 20 km
First Nations	Registered Native Title Body Corporates: • Auburn Hawkwood People Aboriginal Corporation • Wakka Wakka Native Title Aboriginal Corporation
Network service provider	• Powerlink Queensland
Local businesses and service providers	• Kingaroy Chamber of Commerce & Industry • Local schools • Local clubs • Toowoomba & Surat Basin Enterprise • Red Earth Community Association
Local and State Government	• South Burnett Regional Council • Western Downs Regional Council, • State Government MP • Federal MP
State and federal agencies	• State Assessment and Referral Agency (SARA) • Coexistence Queensland • DCCEEW • Department of State Development, Infrastructure and Planning (DSDIP) • Department of Environment, Tourism and Science and Innovation (DETSI) • Department of Local Government, Water and Volunteers (DLGWV) • Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (DNRMMRRD) • Department of Primary Industries (DPI) • Department of Transport and Main Roads (TMR) • Civil Aviation and Safety Authority • Regional Development Australia • Australian Energy Infrastructure Commissioner • Australian Energy Market Operator • Emergency service departments • Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism • National Native Title Tribunal
Local media	• Resonate Regional Radio Network • South Burnett Times • South Burnett Online • ABC Kingaroy
National / state media	• National and state newspapers, radio and television
Utilities	• Telecommunications providers

Stakeholder group	Stakeholder
	• NBN • Electricity and gas • QLD Water Directory
Industry	• Construction industry • Freight industry • Agriculture • Retail • Transport

1.5.3 Consultation to date

The Proponent has consulted with landowners, local and state government from the early stages of Project development. Furthermore, engagement with the parties that hold Native Title of the land within the Project Site, the Auburn Hawkwood People Aboriginal Corporation (AHPAC) and the Wakka Wakka Native Title Aboriginal Corporation (WWNTAC) commenced in 2019 and 2020, respectively, and remains ongoing. Council briefings have been held throughout the course of Project development to date and will continue as the Project progresses.

A Road Infrastructure Agreement will be made between the Proponent and each of South Burnett Regional Council and Western Downs Regional Council for any required upgrade and use of local roads used for Project access and delivery.

Regulator consultation has been undertaken (and is ongoing) with the following regulators:

- Queensland Government including:
  - SARA and DSDIP. SARA also advocates the interests of the relevant Queensland Government departments, being:
    - DETSI
    - TMR
    - DPI
    - DNRMMRRD
    - DLGWV
- Powerlink Queensland
- Australian Energy Market Operator
- South Burnett Regional Council
- Western Downs Regional Council
- Rural Fire Service
- Queensland Fire and Emergency Services.

Community consultation undertaken to date includes face to face meetings, regular phone/email exchanges, online surveys, establishing and updating a Project website (www.tarongwestwindfarm.com.au) and Project contact details (1800 number and email address), community information sessions and information sheet and Project newsletter distribution. The following engagements have been undertaken:

- Ironpot community – Community information sessions – May 2022, October 2022, April 2023, July 2023, November 2023, March 2024
- Kumbia community – Community information sessions – May 2022, October 2022, April 2023, July 2023, November 2023, March 2024
- Chahpingah – Community information sessions – May 2022, October 2022

The Proponent has also attended individual meetings with community members on request.

1.5.3.1 Community Concerns

Key concerns raised by neighbouring dwellings and the community members within the consultation sessions include:

- traffic and transport impacts
- noise impact
- visual impact
- impact of water usage.

In response to the concerns raised and in recognition of the Project timelines relating to construction, operation and decommissioning, the Proponent has undertaken targeted assessments to inform decisions on suitable and viable mitigation measures. These are discussed further in Section 4 and Section 5.

1.5.4 Project Iteration

As a result of this consultation, community concerns and interests have been considered or addressed through Project design changes and further investigation/assessment. The Proponent is also setting up a Community Consultative Committee (CCC) to ensure the community interest in the Project is represented in the future development and construction phases.

1.5.5 Indigenous Engagement

The Proponent is a wholly owned subsidiary of RES Australia Pty Ltd, itself a part of the RES Group, a global renewable energy company, that is forthright in its commitment to working collaboratively with First Nations People. Tarong West Project Co Pty Ltd has consulted Registered Native Title Bodies Corporate (RNTBC) of the land within the Project boundary, the Auburn Hawkwood People Aboriginal Corporation (AHPAC) since 2019 and the Wakka Wakka Native Title Aboriginal Corporation (WWNTAC), since 2020.

AHPAC Country covers most of the Project Site, including all land west of the Boyne River. This includes land hosting 92 WTGs, and the main site facility area and the Powerlink switching station. WWNTAC country, located in the south-east portion of the Project area, hosting 5 WTGs (refer Part A2 Figure 1-5). Walkover survey works on the Project Site with both WWNTAC and AHPAC have been undertaken to identify Cultural Heritage on the Project Site to inform a Cultural Heritage Management Plan (CHMP) with each party. Each CHMP is drafted to ensure that identified Cultural Heritage is managed appropriately throughout the construction and operation of the Project.

The CHMP with AHPAC was fully executed by AHPAC and the Proponent in November 2024 and is in the process of being endorsed by the Cultural Heritage Unit of the Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism. The specific content around negotiations and agreements is confidential. However, the Proponent supports the best practice outlined in the *Clean energy agreement making on First Nations land: What do strong agreements contain?* (O'Neill *et al.* 2021) publication and is confident that the agreed terms suitably recognise the contributions of First Nations People and impacts on First Nations People.

Monitoring of geotechnical works was also conducted by both RNTBCs to ensure no impact to cultural heritage during the geotechnical program. Consultation with both RNTBCs will continue throughout the balance of the development phase, with the establishment of a Cultural Heritage Management Plan (CHMP) with WWNTAC scheduled for early 2025.

Consultation undertaken to date and proposed for the future has been reviewed alongside the *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* (DCCEEW 2023). Further details on how the consultation aligns with the document are provided in Section 7.2.

1.5.6 Ongoing Consultation

Further community information sessions are planned to continue on a regular basis throughout the development phase of the Project.

As mentioned in Section 1.5.4, a Community Consultative Committee (CCC) will be implemented in early 2025. The CCC will be made up of Project stakeholders including Council staff, Project neighbours and Proponent team members. The group will meet regularly throughout each calendar year for the remainder of the development phase and all of the construction phase. The meetings will facilitate ongoing discussion concentrated on Project progress, mitigation of known impacts and effectiveness of mitigation measures, and previously unforeseen impacts. The meetings will be chaired by an Independent Chairperson.

A regular newsletter is emailed to all community members that have opted to be on the mailing list. This newsletter and other regular updates are also uploaded to the Project website. This will continue throughout development and construction of the Project.

The Proponent has actively contributed to the local community by supporting various organisations and initiatives, including schools, sports clubs, community halls, and other groups. This involvement and support reflect the Proponent's commitment to fostering positive community relationships and impacts, which will continue throughout the Project construction and operation phases.

Sponsorships to date include the following:

- Bunya Mountains Community Association Inc.
- Burrandowan Picnic Race Club
- Coolabunia State School
- Durong South State School P & C
- Ironpot Farmers Hall Committee
- Ironpot Wild Dog Trapping Syndicate
- Kingaroy Bowls Club Inc.
- Kingaroy Boxing Club
- Kingaroy State High School
- Kumbia Hall
- Kumbia Lutheran Church
- Kumbia Sport and Recreation Association Inc.
- Kumbia State School P & C
- Kumbia Kindergarten
- Kumbia Memorial School of Arts Inc.
- Maidenwell Music Mix
- Red Earth Community Foundation South Burnett
- South Burnett Saints AFL Club
- The HerKind Project Inc.
- Toowoomba and Surat Basin Enterprise.

1.6 Environmental Record of the Proponent

1.6.1 Proponent's History of Proceedings

The Proponent has a system that delivers responsible environmental management and is committed to transparent and meaningful engagement with planning and environmental authorities with respect to its development projects.

The Proponent is the world's largest independent renewable energy company, working across 24 countries and active in wind, solar, energy storage, green hydrogen, transmission, and distribution. An

industry innovator for over 40 years, the Proponent has delivered more than 27 GW of renewable energy projects across the globe and plans to bring more than 22 GW of new capacity online in the next five years.

The Proponent is the power behind a clean energy future where everyone has access to affordable zero carbon energy bringing together global experience, passion, and the innovation of its 4,500 people to transform the way energy is generated, stored and supplied.

The Proponent entered the Australian market in 2004 and now employs over 150 people across the country, with offices in Sydney, Melbourne, Brisbane and multiple regional locations. The Proponent is engaged in all technologies: wind, solar and storage and offers development, construction management, and asset management and manages a portfolio of 2.06 GW of renewable assets in Australia. This includes some of the largest wind farms in the southern hemisphere: Murra Warra Wind Farm and Dulacca Wind Farm, as well as Emerald Solar Park; one of the first solar farms commissioned in Australia.

The Proponent has undertaken several projects approved under the EPBC Act and has satisfactorily implemented all the conditions of its previous Commonwealth and State approvals.

There are no proceedings under any Commonwealth, State, or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the person proposing to take the action or the person making the application.

1.6.2 Proponent's Environmental Policy and Planning Framework

The Proponent recognises the importance of reducing human impact on the environment and that various aspects of the business, which includes development, research, construction, operation and maintenance of renewable energy facilities, impacts on the environment in ways that are both positive and negative. The Proponent endeavours to minimise the effects of their activities on the environment whenever and wherever practicable and work to secure measurable business benefits from our Environmental Management System (EMS). The Proponent is committed to the prevention of pollution and to the continual improvement in their environmental performance.

The Proponent is committed to achieving environmental best practice throughout its business activities by:

- establishing and maintaining an Environmental Management System modelled to ISO14001:2015
- integrating the Environmental Management System with the Safety and Quality systems
- ensuring legal compliance with applicable environmental legislation and with other requirements to which are applicable
- monitoring purchasing practices and internal operations including energy, and transport to ensure effective use of natural resources and wherever and whenever practicable minimising their environmental impact
- reducing, re-using and recycling waste produced in all parts of their business as far as is practicable
- where possible, monitoring and working with our suppliers and other third parties associated with their business, encouraging them to set similar high standards
- seeking to integrate environmental considerations into future business policy decisions
- ensuring employees and management understand and are accountable for the achievement of these policy goals through communication and training
- communicating the policy as appropriate to customers, suppliers, interest groups and the public
- developing and maintaining systems to implement and review this policy and seeking continual improvement.

Section 2.0 Description of the environment

2.1 Land use

The primary use of the land that comprises the Project Site is agriculture, specifically cattle grazing with limited, discrete areas across the site used for cropping for cattle feed. The majority of the Project Site is classified as greenfield land and categorised by the Australian Land Use and Management Classification system as 'grazing native vegetation' (Australian Bureau of Agricultural and Resource Economics and Sciences, 2016). Grazing native vegetation is characterised by domestic stock grazing on native vegetation where there has been limited or no deliberate attempt to modify pastures.

Historical aerial imagery available from QImagery (Queensland Government, 2024) indicates the broader Ironpot area was cleared prior to 1951. Since this time, the area has been subject to various agricultural production intensities and vegetation communities have regenerated in some areas as a result of natural regeneration or assisted regeneration.

Alongside agricultural production in the broader region, activities related to energy generation have also been established. This includes the Tarong Power Station (coal fuel) which commenced operations in 1984, Coopers Gap Wind Farm which completed construction in 2020, and Wambo Wind Farm which is presently under construction. Under the South Burnett Regional Planning Scheme, the Project Site is zoned as rural which seeks to accommodate relevant activities such as cropping, intensive horticulture and animal industries and animal keeping. The existing use aligns with the intent of the zone as it accommodates rural activities (primarily livestock grazing).

To facilitate the Project, State planning approvals are required and these were granted on 25 July 2024. The State planning approvals include:

- Development permit for a Material Change of Use for a Wind Farm.
- Development permit for Operational Work for Clearing Native Vegetation.

The Project has been designed to complement the existing rural zone intent of the area and will co-exist with current rural activities.

Sensitive land uses

The State planning framework and approval requires a 1,500 m setback from existing or approved sensitive land uses (e.g. dwelling houses) on non-host lots. This requirement has been incorporated into the Project design resulting in no wind turbines being proposed within 1,500 m of existing or approved sensitive land uses on non-host lots.

Surrounding land uses

The surrounding land uses are predominantly rural activities similar to the Project Site (i.e. primarily livestock grazing amongst native vegetation).

The Project Site is traversed in the north by state-controlled Kingaroy-Burrandowan Road, and dissected by several local roads, including Ironpot Road, Jumma Road, Boyne River Road and Greystonlea-Jumma Road. To the southeast of the Project Site is the Bunya Highway which is part of The Great Bunya Drive scenic route. Further east is a second scenic drive named Australia's Country Way.

As mentioned previously, the Project Site is located amongst an area where several renewable and non-renewable power generation plants are currently operating or under construction. This includes Coopers Gap Wind Farm (currently operating) located 5 km south, Wambo Wind Farm (under construction) located 10 km west and Tarong Power Station and Tarong North Power Station (currently operating) located 33 km southwest.

A key consideration for site selection at Project inception was the existing Powerlink transmission line that bisects the site. The following electrical transmission easements intersect the central portion of the Project Site:

- Queensland Electricity Transmission Corporation Limited (QETCL) Easement T RP826361 through Lot 4 RP890694
- QETCL Easement U RP826360 through Lot 7 RP890694
- QETCL Easement V RP826359 through Lot 5 BO330

- QETCL Easement X RP826357 through Lot 29 BO243
- QETCL Easement Y RP826357 through Lot 29 BO243
- QETCL Easement Z RP826356 through Lot 64 BO190
- QETCL Easement A RP826355 through Lot 68 RP800291
- QETCL Easement B RP826355 through Lot 68 RP800291.

These landscape elements (road network, other power generation facilities and easements) are illustrated in Part A2 Figure 2-2.

2.2 Bioregion

The Project Site is located on the southern border of the Brigalow Belt (South) bioregion in the Banana-Auburn Ranges subregion. The southern edge of the Project Site overlaps into the South East Queensland bioregion in the South Burnett subregion, in Lot 68 RP800291 and Lot 10 SP168643 (refer Part A2 Figure 2-2). Landforms are primarily undulating plains and hillslopes.

The Brigalow Belt (South) bioregion is the largest bioregion in the State and encompasses an area from Townsville in North Queensland to the State border with New South Wales in the south. The Great Dividing Range is a dominant natural feature throughout the bioregion with smaller mountain ranges, such as the Bunya Mountains approximately 10 km south of the Project Site, occurring throughout the extent. The major river basins in the bioregion are Burdekin, Fitzroy and Warrego-Condamine (Department of Environment and Science, 2018).

At the bioregion scale, brigalow (*Acacia harpophylla*) woodland is a defining characteristic and this has been subject to a high rate of broadscale clearing to facilitate agricultural pursuits. Now, this ecological community is protected from new impacts under the EPBC Act and at the State level, the VM Act provides a protection framework. Ecological surveys did not detect any vegetation consistent with the Lowland Rainforest of Subtropical Australia or Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological communities (TEC).

2.3 Vegetation

The Project Site is currently used for cattle grazing with areas of cleared paddocks and standing vegetation. Regional ecosystem (RE) and remnant vegetation mapping published by the State identifies majority of the Project Site as comprising non-remnant vegetation (refer Part A2 Figure 2-4). Ground-truthing of this mapping confirmed the Project Site consists predominantly (90.56%) of non-remnant vegetation, most of which is grazing land (refer Section 4.2 of the original Assessment of Matters of National Environmental Significant (MNES) prepared by Ecosure (August, 2023) and Part A2 Figure 2-5). Field-verified remnant vegetation and high-value regrowth occurs within 7.61% and 1.84% of the site, respectively. Field-verified vegetation consists mainly of eucalypt woodland, open eucalypt forest, and grassland. Imagery presented in Plates 1 to 5 illustrates the landscape and vegetation attributes.

As identified within Section 4.2 of the original Assessment of Matters of National Environmental Significant (MNES) prepared by Ecosure (August, 2023), eight REs are present within the Project Site, all of which are considered least concern under the VM Act except for RE 11.8.3 (semi-evergreen vine thicket on Cainozoic igneous rocks), which is considered to be Of Concern under the Queensland VM Act and is a possible TEC under the Commonwealth EPBC Act. The area of 11.8.3 within the Project Site was not consistent with the diagnostic criteria for the semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC, as it has a canopy dominated by eucalypts and a sparse mid-storey of vine thicket species and was therefore determined not to be a TEC in this case.

Plate 1 Mannuem Road

Plate 2 Mannuem Road

Plate 3 Ironpot Road

Plate 4 Ironport Road

Plate 5 Ironpot Road

Most eucalypt woodland/forest REs present in the Project Site are in average to good condition, providing numerous small hollows suitable for nesting or denning by small arboreal fauna, important seasonal nectar resources, and other types of fauna habitat such as rocky outcrops, fallen timber and debris. Some areas have been degraded by partial clearing, intense fire, heavy grazing and weed invasion, particularly by African lovegrass (*Eragrostis curvula*) and Mayne's pest (*Glandularia aristigera*). Riparian woodland/forest REs occur in narrow bands along some of the major watercourses in the site and provides scattered large hollows and numerous small hollows for arboreal fauna, including Greater Gliders. Many riparian areas have been degraded by clearing, intense fires, minor to

moderate streambank erosion, and weed infestation, particularly by Guinea grass (*Megathyrsus maximus*), blue heliotrope (*Heliotropium amplexicaule*), African lovegrass and lantana (*Lantana camara*).

The small patch of vine thicket (listed as Of Concern under the Queensland VM Act) recorded within the site is in poor condition due to encroachment of fire, extensive wild pig damage in some areas and dense infestations of weeds, particularly Lantana). Nonetheless, the planning corridor and clearing footprint avoid this vegetation. Cleared grassland is the main habitat type within the site, containing isolated to scattered trees. Many grassland areas are in poor condition due to clearing, grazing, and weed invasion, particularly African lovegrass and Mayne's pest.

2.4 Hydrology

The Project Site incorporates six main catchments which include the Boyne River and its main tributaries comprising 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 Project Site (refer Part A2 Figure 2-6). The runoff distribution for the catchments is complicated due to the number of contributing catchments, consequently all rainfall within the Project Site will enter the Boyne River system. Additionally, the Coopers Gap Wind Farm is located upstream of the Project Site and the Jumma Creek, Boughyard Creek and Ironpot Creek catchments are common to both.

The Middle Creek catchment is contained within the Project Site to near entirety and therefore all run-off within this catchment is generated within Project Site before entering the Boyne River further downstream. Boughyard Creek, Jumma Creek and Ironpot Creek all have a number of contributing tributaries and hence have larger catchments. As a result, portions of these catchments lie within the Project Site before entering the Boyne River system.

The Boyne River system is a major tributary of the Burnett basin which has an approximate area of 2,496 km² (DES, 2013) which makes up approximately 8% of the 32,220 km² Burnett Basin.

The Boyne catchment is located just south of the Tropic of Capricorn in Queensland. The Boyne River joins the Burnett River (near Mundubbera), before flowing to Paradise Dam and eventually discharging to the Pacific Ocean (north of Hervey Bay) at Bundaberg. The total catchment area of the Burnett River is approximately 33,000 km^2.

Due to the nature of the proposed development, the infrastructure is generally located in areas of topographic rise (hills). As such, the interactions between waterways and flooding are limited for turbines and infrastructure areas. Proposed access track/road construction and primarily co-located underground electrical reticulation interact with waterways and drainage paths.

One major watercourse flows generally south to north within the Project Site. The Boyne River begins as a second order stream in the south of the site, becomes a third order stream near Ironpot Road on Lot 68 RP800291, a fourth order stream at its junction with Middle Creek on Lot 62BO188, and a fifth order watercourse at its junction with Mannuem Creek on Lot 60 BO188, before exiting the site along the north-western boundary of Lot 4 RP890694. The Boyne River feeds into Boondooma Lake and the Burnett River before discharging at Bargara near Bundaberg.

As the Project Site contains the Boyne River watercourse and is contributed to by its upstream tributaries it is considered that drainage within the footprint is moderate in terms of width, channels are well-defined and low to moderate gradients ranging from 0.2 to 1.3%. The drainage features are considered moderate across the planning corridor with approximately 50% of the streams within the total catchment having a stream order of 1 with the remaining waterlines having a stream order of 2 or 3 (based upon the Horton Stream Order approach).

2.5 Soils

The soils spatial data available from the DNRMMRRD is mapped on Part A2 Figure 2-7. The southern and western sections of the site are mapped as vertosols, with ferrosols mapped in the central-eastern portion, changing to sodosols for the northern-most section.

- Vertosols: a grey, shrink-swell, cracking clay soil with a self-mulching surface and a gypsic horizon in the subsoil. Vertosols have moderate to low permeability, depending on surface condition and water content. Erosion hazard is moderate on disturbed slopes. The soil type is usually extremely saline below 0.5 m and strongly acid at depth.
- Ferrosols: well-drained soils with red or yellow-brown colour with clay-loam to clay textures associated with areas of former volcanic activity. Ferrosol topsoils typically contain 35-50% clay, with kaolinite the dominant clay mineral, and high iron content. They have a relatively stable structure and are used for intensive crop production in the Kingaroy region.
- Sodosols: a texture-contrast soil that is strongly sodic and not strongly acid in the upper 0.2 m of the red clayey B horizon, the lower part of which is calcareous. Sodosols have low to very low permeability in the sodic B horizon. Erosion hazard is high, due to a highly dispersive layer below 0.15 m. The soil type has high to very high salinity below 0.30 m.

Based on geotechnical investigations completed in 2023 to inform Project designs (CMW Geosciences, 2023), materials classified as topsoil were typically described as clayey sand, clay or sandy clay and were generally encountered up to 0.2-0.3 m depth below the existing surface level. These results are aligned with the soils spatial data illustrated in Part A2 Figure 2-7, albeit the former is a higher order of detail and site-specific.

The regional mapping of soils suggest that a variety of soil conditions could be encountered across the distributed Project development which is also consistent with the Geotechnical Report. TWWF site ground conditions are highly variable due to not only variations in the regional geology but significant variations in the degree of weathering. Whilst some outcropping was observed in places, the test pitting and drilling works generally encountered soil strength or extremely weathered rock materials in the upper few metres of the subsurface profile.

The primary soils risks associated with the Project are expected to be:

- dispersive soils (Sodosols) may require specific erosion and sediment control measures to be instated, and specific construction or handing methods may need to be used to manage potential impacts. However, based on the Geotechnical Report Section 3.2 Geotechnical Hazards, the Emerson class testing indicates that the site soils are not dispersive.
- acidic soil and saline soils (such as the Vertosols) may need to be treated with soil ameliorants if they are disturbed. However, based on the Geotechnical Report Section 2.3.3 there are no acid sulfate soils (ASS) mapped in the study area, as per the Guidelines for the Use of Acid Sulfate Soil Risk Maps (DLWC 1998).

Additional site-specific findings have been included in the Geotechnical Report (CMW, 2023) and are listed below:

- predominantly soil cover was observed at the surface, with some outcropping present at topographical high spots with scattered rock fragments encountered throughout. An excavation to the west of the proposed Powerlink substation exposed extremely weathered granitic soils.
- based on the guidance of the AS2870-2011 and the reactivity of the soils encountered during the geotechnical investigation, the site is classified as ‘M’ being moderately reactive, which may experience moderate ground movements from moisture change.

2.6 Geology

The site predominantly occurs on the Chahpingah Meta-igneous Complex, which is a granite dominated geology. The Evergreen Formation (comprising sandstone, mudstone and siltstone) dominates the southern portion of the site around the upper reaches of the Boyne River along with a small intrusion in the north-western portion. Quaternary alluvium occurs around the Boyne River and other larger watercourses in the northern portion of the site.

The geotechnical investigations completed in 2023 to inform Project designs (CMW Geosciences, 2023), concluded the following relating to geography across the Project Site:

The ground conditions encountered and inferred from the investigation of the Project Site were generally consistent with the published geology for the area, and can be generalised according to the following units:

- Unit 1A – Residual or colluvial near surface soil strength material typically encountered as silty sand, clayey sand or sandy clay, in either a loose to medium dense or stiff consistency.
- Unit 1B – Residual or colluvial near surface soil strength material, generally comprised of very stiff to hard clay/sandy clay with gravel and dense to very dense clayey sand.
- Unit 2 – Extremely weathered bedrock general recovered as a dense to very dense clayey sand/clayey gravelly sand or hard sandy clay/clay with a mixture of gravels, cobbles and sometimes boulders inferred to be derived from *in situ* weathering of underlying bedrock.
- Unit 3A – Highly to moderately weathered metamorphosed and altered sedimentary units, typically low to medium strength.
- Unit 3B – Moderately weathered (or better) metamorphosed and altered sedimentary units, typically high to very high strength.
- Unit 4A – Highly weathered low to medium strength highly metamorphosed volcanic rock, typically highly weathered fine grained gneiss, granite, metasandstone, or basalt.
- Unit 4B – Moderately to slightly weathered high to very high strength metamorphosed volcanic rock, typically moderately weathered, fine grained gneiss, granite, metasandstone or basalt.

2.7 Topography and Elevation

Elevation within the Project Site ranges between 390 m Australian Height Datum (AHD) to 570 m AHD throughout as the Project Site is situated generally in areas of topographic rise (hills). The terrain is varied, with slopes and elevated features providing a mix of gently sloping areas and steeper sections that influence both accessibility and design considerations. A detailed aerial LiDAR survey has been conducted and used to inform the design, offering a high degree of confidence in understanding the site terrain and its suitability to host Project infrastructure.

2.8 Cultural Heritage

There are no Commonwealth, State or Local heritage places within the Project Site. There is a low likelihood of identifying historical heritage values within the Project Site.

No Aboriginal cultural heritage sites and places are registered within the Project Site.

The Registered Native Title Body Corporates of the Country on which the Tarong West Wind Farm is proposed are the AHPAC and the WWNTAC.

In November 2024, the Proponent reached agreement with the AHPAC and a Cultural Heritage Management Plan (CHMP) came into effect. The terms of this CHMP are confidential.

The Proponent is consulting the WWNTAC and anticipates a similar CHMP with confidential terms will be reached in the near future.

2.9 Transport route

The construction phase traffic impact of the wind farm development will result from the transportation of over-size/over-mass (OSOM) components, equipment, materials, and workers. Transport studies (icubed Consulting 2023a, 2023b) have assessed vehicle clearance requirements and route study outcomes, identifying suitable transport routes expected to accommodate development traffic to and from the Project Site. The study outlines the existing conditions of the proposed OSOM transport route and identifies the expected road or intersection upgrades required to enable blade vehicles to navigate from the Port of Brisbane to the Project Site. The OSOM transport route is considered the critical route to the Project Site, with smaller delivery vehicles expected to use the existing road network without the need for road or intersection upgrades.

Ecosure (2023b) (refer Appendix S) completed an ecological assessment as part of a Transport Route Study. This involved undertaking a likelihood of occurrence assessment based on desktop data for conservation significant species potentially present in the transport route. The likelihood assessment was used to guide targeted assessments in areas of the transport route where the existing road network requires modification to allow passage of oversize vehicles to the Project Site.

No conservation significant flora species or TEC were identified in the transport route survey sites. Most survey sites contained non-remnant grassland dominated by exotic species such as African lovegrass, Guinea grass, Mayne's pest and green couch. Some non-remnant areas also contained scattered native trees, in particular *Eucalyptus* and *Angophora* species.

One MNES fauna species was detected within the transport route survey sites:

- koala (*Phascolarctos cinereus*), listed as Endangered under both the *Environment Protection and Biodiversity Conservation Act 1999* and *Nature Conservation Act 1992*

This PER considers the cumulative Project Site (inclusive of the wind farm clearing footprint and the component of the transport route within the Project Site) to confirm the level of impact of the proposed works and identify measures to minimise and or mitigate the impacts.

3.0 Matters of National Environmental Significance

3.1 Matters of National Environmental Significance

This PER is supported by the following technical document and should be read in conjunction with this report:

- Supplement to the Assessment of Matters of National Environmental Significance - Tarong West Wind Farm June 2025 (Ecosure, 2025d) (refer Appendix E).

This section provides an assessment of the potential for presence of protected matters within the Project Site. A comprehensive likelihood of occurrence assessment based on an updated report from the Protected Matters Search Tool (PMST), dated 18 March 2025, was completed as part of the assessment of Matters of National Environmental Significance (MNES) listed above. The Guidelines for the Content of a Draft Public Environment Report (DCCEEW 2024; PER Guidelines) includes a list of threatened species, threatened ecological communities (TEC) and migratory species to be assessed, as a minimum, in the PER.

Since the delivery of the PER Guidelines, several species have been delisted as migratory species (black-faced monarch [*Monarcha melanopsis*], rufous fantail [*Rhipidura rufifrons*], satin flycatcher [*Myiagra cyanoleuca*] and spectacled monarch [*Symposiachrus trivirgatus*]). In addition, some species previously identified as threatened species under the EPBC Act has recently been delisted including marsh sandpiper (*Tringa stagnatilis*), *Lepidium monoplocoides, Paspalidium grandispiculatum* and *Sarcochilus weinthalii*. The delisting of migratory and threatened species under the EPBC Act therefore results in these species no longer being included within the updated PMST search results. Consequently, these species have not been considered further in the PER, although they may remain in supporting documentation that predates these listing changes. One newly uplisted species identified in the latest PMST search, Belson's panic (*Homopholis belsonii*), is addressed in the updated likelihood of occurrence assessment (refer Section 3.3). Protected matters addressed in this PER, as detailed in the PER Guidelines are listed in Table 3-1. This list was expanded to include species included in the MNES assessment and / or identified in the updated database searches considered possible to occur in the Project Site. No Threatened Ecological Communities (TECs) are considered likely to be present within the Project Site.

Table 3-1 Protected matters addressed based on the PER Guidelines

Common name	Scientific name	EPBC status[1]
Listed threatened species and ecological - communities (s18 and s18A)		
Fauna		
black-breasted button-quail	*Turnix melanogaster*	V
central greater glider	*Petauroides armillatus* (syn. *Petauroides volans* southern and central)	E
Corben's long-eared bat, south-eastern long-eared bat	*Nyctophilus corbeni*	V
diamond firetail	*Stagonopleura guttata*	V
glossy black-cockatoo	*Calyptorhynchus lathami lathami*	V
grey-headed flying fox	*Pteropus poliocephalus*	V
koala	*Phascolarctos cinereus*	E
New Holland mouse	*Pseudomys novaehollandiae*	V
red goshawk	*Erythrotriorchis radiatus*	E
regent honeyeater	*Anthochaera phrygia*	CE
squatter pigeon	*Geophaps scripta scripta*	V
white-throated needletail	*Hirundapus caudacutus*	V, Mi
yakka skink	*Egernia rugosa*	V

Common name	Scientific name	EPBC status[1]
yellow-bellied glider	*Petaurus australis australis*	V
Flora		
Austral toadflax	*Thesium australe*	V
-	*Coleus omissus* (syn. *Plectranthus omissus*)	E
hawkweed	*Picris evae*	V
Helidon ironbark	*Eucalyptus taurina*	E
-	*Polianthion minutiflorum*	V
wandering peppercress	*Lepidium peregrinum*	E
Listed migratory species (s20 and s 20A)		
white-throated needletail	*Hirundapus caudacutus*	V, Mi
fork-tailed swift	*Apus pacificus*	Mi
oriental cuckoo	*Cuculus optatus*	Mi
Additional species		
Australasian bittern	*Botaurus poiciloptilus*	E
glossy ibis	*Plegadis falcinellus*	Mi

1. Conservation status under the EPBC Act: CE = Critically Endangered, E = Endangered, V = Vulnerable, Mi = Migratory

3.2 Methods

Assessment was undertaken for each relevant protected matter, informed by desktop assessment and field surveys, to inform an evaluation of potential impacts, as outlined in the following sections

3.2.1 Desktop assessment

The following sources of information were assessed as part of the literature review to identify records of listed threatened or migratory species, to inform field surveys and to evaluate the habitat potential of the Project Site:

- EPBC Act PMST report (18 March 2025) for a 10 km buffer surrounding the Project Site (DCCEEW, 2024l).
- DETSI WildNet database for a 10 km and 20 km buffer surrounding the Project Site (represented as 20 and 30 km buffer around the central point -26.5941, 151.52069) (DETSI, 2025).
- The Atlas of Living Australia (ALA) database for locations of conservation significant fauna and flora species (ALA, 2025).
- Vegetation management mapping maintained by the Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development (DNRMMRRD) (DoR, 2022a, 2022b), including remnant and pre-clear regional ecosystem (RE) map (version 12.02), regulated vegetation management map (version 6.04), vegetation management watercourse and drainage feature map (version 6.0), vegetation management wetland map (version 8.0) and essential habitat map (version 11.0).
- RE description database – version 12.1 (Queensland Herbarium, 2023).
- Biodiversity Planning Assessment maps identifying significant fauna corridors and areas of state, regional and local biodiversity significance in the Brigalow Belt bioregion (DES, 2018a) and South-east Queensland (SEQ) bioregion (DEHP, 2016).

- Protected plants survey trigger map to identify high risk areas for protected plants listed under the NC Act (DES, 2022).
- Wind Farms and Birds: Interim Standards for Risk Assessment Australian Wind Energy Association Report (Brett Lane & Associates and Aria Professional Services, 2005), to inform bird survey design.
- Available remote imagery.
- Onshore Wind Farm Guidance: Best practice approaches when seeking approval under Australia's national environment law, draft for consultation May 2024 (DCCEEW, 2024j).
- Onshore Wind Farms – interim guidance on bird and bat management (DAWE, 2021b).
- Other published and non-published literature including but not limited to:
    - Conservation advice issued for species and communities
    - Identifying habitat for the endangered koala (DCCEEW, 2024e)
    - A review of koala habitat assessment criteria and methods (Youngentob, Marsh and Skewes, 2021)
    - Guide to greater glider habitat in Queensland (Eyre et al., 2022).

Desktop information was used to inform the design of field surveys and to assess the likelihood of occurrence of Commonwealth protected matters within the Project Site.

3.2.2 Field survey

Flora and fauna surveys were conducted over several survey periods and seasons from 2018 to 2025. Detailed methods are presented in the supporting documentation (Appendix E). Weather conditions during survey periods are outlined in Table 3-2. Field surveys completed are summarised in Section 3.2.2.

Table 3-2 Weather conditions during field ecology surveys

Weather condition	Spring 2018	Autumn 2019	Spring 2020	Spring 2021	Summer 2022	Autumn 2022	Winter 2022	Spring 2022	Summer 2023	Autumn 2023	Winter 2023	Spring 2023	Autumn 2024	Autumn 2025
Total rainfall (mm)	5.4	14.4	29	44	84.6	0	0	0	37.2	0	0.2	6.8	0.4	32.6
Average minimum temperature (°C)	14.3	15.2	15.4	14.2	17.7	1.3	2.1	9.9	21.3	5.2	3.2	11.7	13.1	18.2
Average maximum temperature (°C)	29.6	25.7	32.2	26.9	27.4	20.9	21.5	24.4	31.8	24.6	25.6	29.8	26.2	25.8
Wind gust range (km/h)	19 -54	28 - 43	20.9 - 24.8	3 - 48	17 - 46	17 - 43	24 - 46	22 - 44	30 - 50	19 - 37	24 - 37	30 - 46	22-28	20 - 31
Number of days	19	12	6	14	8	6	6	6	6	6	6	6	4	4
Surveys	Flora, fauna, and bird surveys	Flora, fauna, and bird surveys	Fauna and bird surveys	Fauna and bird surveys	Bird surveys	Bird surveys	Bird surveys	Bird surveys	Bird surveys	Bird surveys	Bird surveys	Bird surveys	Flora and fauna habitat quality and Bio Condition surveys (offset and impact site)	Targeted species surveys (Project Site)

3.2.2.1 Flora and vegetation surveys

The assessment of flora values and vegetation communities within the Project Site comprised the following:

- Identification and verification of vegetation communities within the Project Site (19 detailed sites and 153 observational sites), including:
  - 119 sites in areas mapped as remnant and/or high value regrowth (HVR) REs
  - 53 sites in areas mapped as non-remnant observational sites noted landform and dominant canopy species detailed assessments recorded additional floristic and structural information, including:
  - structural characteristics of the vegetation (based on life forms, strata, approximate height and percentage cover)
  - vegetation condition (integrity as either pristine, excellent, very good, good, average, degraded or completely degraded)
  - presence of weed species
  - presence and population characteristics of any threatened flora species
  - dominant and common species in each structural component (stratum) of the vegetation
  - landscape characteristics
  - geology and soil characteristics, including erosion
  - wetland characteristics (if present)
  - notes on sensitivities to the possible impacts from the proposed activities
  - identification of the RE based on site survey results.
- Identification and verification of the three TECs listed under the EPBC Act (19 detailed sites, including areas mapped as containing REs that can form components of TECs), considered possible to occur within the Project Site based on desktop assessment:
  - lowland rainforest of Australia – possible as component RE 12.8.3 is mapped within 10 km of the Project Site
  - semi-evergreen vine thickets (SEVT) of the Brigalow Belt (North and South) – possible as component RE 11.8.3 is mapped within the Project Site
  - brigalow (*Acacia harpophylla* dominant and codominant) – possible as component REs are mapped within 10 km of the Project Site.
- Rapid assessment of condition of vegetation communities.
- Targeted searches for threatened flora species (36 sites).
- Assessment of habitat value for threatened flora species.

Flora surveys included the following:

- 2018 spring surveys completed by one team of two ecologists across the Project Site over ten days from 23 October to 1 November 2018.
- 2019 autumn surveys completed by one team of two ecologists across the Project Site over four days from 2 to 5 April 2019.
- Weed surveys were completed by a team of two ecologist across the Project Site over six days from 1 to 6 November 2021.
- Incidental flora sightings were also recorded by fauna teams during the 2020, 2021 and 2022 fauna surveys and the biosecurity matter surveys in 2021.

- BioCondition surveys were completed across the impact area and offset areas in autumn 2024 by three teams of two ecologists between 16 April to 23 May 2024.
- Targeted flora surveys were completed by a team of two ecologists over four days from 30 April and 3 May 2025.

Where important plant species could not be identified in the field (e.g. dominant and characteristic species), specimens were collected in a plant press for further analysis by Ecosure botanical staff or the Queensland Herbarium. Specimens of suspected threatened flora species were also sent to the Queensland Herbarium for confirmation and incorporation into the herbarium records.

3.2.2.1.1 Threatened plant survey

The desktop assessment identified the threatened flora species that were considered likely to occur or possible within the Project Site. A survey program which was designed to detect target species and to meet the requirements for EPBC Act survey guidelines as described in Table 3-3. Due to the large size of the Project Site, surveys for threatened flora species were prioritised and targeted to areas with potential habitat value. Areas of habitat value were identified from RE mapping data and verified in the field. Flora surveys in 2019 were completed at 19 sites using the random meander method (Cropper, 1993). This method requires that a botanist walks a random path within a suitable habitat area recording all species until the habitat has been thoroughly searched or no new flora species have been added to the list for 30 minutes.

Threatened plant surveys in 2019 were also conducted at seven potential stream crossing sites. Both banks and the stream bed were searched for 100 to 200 m upstream and downstream of the proposed crossing sites.

Surveys targeting wandering peppercress and austral toadflax were completed in 2025 in riparian habitat within the impact area using a timed random meander method survey at 11 sites. This method required a botanist to walk a random path within suitable habitat and within a 50 m buffer of the clearing footprint until the habitat has been thoroughly searched. Additional targeted searches, using a timed meander method, for *Polianthion minutiflorum* and *Paspalidium grandispiculatum* was completed in one small area of limited suitable habitat within the impact area. This was the only observed habitat considered suitable to potentially support these two species. Part A2 Figure 3-1 identifies locations of plant surveys, and Part A2 Figure 3-2 identifies the locations of threatened plant surveys.

Table 3-3 Survey effort for threatened flora species potentially occurring within the Project Site

Name	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure	Survey limitations
Lepidium peregrinum **wandering peppercress**	No survey or referral guidelines are available for this species.	N/A	Timed random meanders in suitable habitat (remnant and non-remnant riparian communities).	Most peppercress plants dead at time of survey. However, occasional live plants allowed identification.
Leuzea australis **(synonym *Rhaponticum australe*** **Austral cornflower**	No survey or referral guidelines are available for this species.	N/A	Timed random meanders in suitable habitat (woodlands on heavy clay soils).	None identified, identifiable when flowering from autumn to spring.
Thesium australe **Austral toadflax**	No survey or referral guidelines are available for this species.	N/A	Timed random meanders in suitable habitat (woodland in damp riparian areas).	None identified, identifiable year-round.

Name	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure	Survey limitations
Polianthion minutiflorum	No survey or referral guidelines are available for this species.	N/A	Timed random meanders in suitable habitat (woodlands on sandstone and laterite soils).	None identified, identifiable year-round.

3.2.2.1.2 Biosecurity matters

Introduced flora species were recorded during the spring 2018 and autumn 2019 surveys, Spring 2021 surveys and incidentally throughout other surveys at the Project Site.

3.2.2.2 Fauna surveys

The assessment of fauna values within the site comprised the following:

- Identification and verification of fauna habitats at 64 sites within the Project Site based on RE mapping data and site assessment including searches for:
  - rocks and rocky outcrops, exfoliating rocks and rocks with crevices
  - trees and logs with hollows, senescent (old) or dead trees (stags) and trees or logs with peeling bark or loose bark (abundance)
  - estimate of habitat condition, based on visual assessment
  - vegetation cover, including canopy, shrub, ground cover, and leaf litter characteristics
  - habitat features/food resources, e.g. termite mounds, mistletoe, and flowering trees
  - presence of standing water or ephemeral waterways
  - presence of scats, tracks, and other traces of fauna utilisation
  - 10 minutes of active searching in leaf litter, rocks, and logs for targeted fauna species (e.g. collared delma).
- Assessment of habitat value for threatened species including identifying critical elements for species usage such as koala feed tree species, hollow-bearing trees and micro-habitat features.
- Targeted searches and baited camera trapping for threatened fauna species considered likely or possible to occur:
  - searches for koala scats based on koala spot assessment technique (SAT) (Phillips and Callaghan, 2011)
  - nocturnal call playback for koala
  - camera trapping for quolls
  - spotlighting for nocturnal fauna, including koala, greater glider (southern and central), and grey-headed flying-fox
  - call playback for black-breasted button-quail
  - black-breasted button-quail active searches for platelets
  - searches for south-eastern glossy black-cockatoos and orts (chewed seed codes).
- Ultrasonic detection using Anabat and Songmeter call recorders and harp trapping for microbats.
- Bird and Bat Utilisation Surveys (BBUS) from 2018 to 2023 (Ecosure, 2025b) (refer Appendix J).
- Koala and greater glider habitat quality assessment surveys.

Fauna surveys included:

- 2018 spring survey completed by one team of two ecologists over 12 days from 29 October to 9 November 2018.
- 2019 autumn survey completed by two teams of two ecologists over 11 days from 25 March to 5 April 2019 (one team conducted general fauna surveys and the other team conducted fixed point count bird surveys for the bird utilisation survey).
- 2020 spring survey completed by two teams of two ecologists over six days from 23 November to 28 November 2020 (one team conducted general fauna surveys and the other team conducted fixed point count bird surveys for the bird utilisation survey).
- 2021 spring survey completed by one team of two ecologists over 13 days from 25 to 31 October and 1 November to 7 November (including general fauna surveys and fixed point count bird surveys).
- Pre-construction bird and bat utilisation surveys (BBUS (Ecosure, 2025b), refer Appendix J), consisting of fixed-point count bird surveys completed by one team of two ecologists:
    - 2022 summer (21 to 24 February and 17 to 18 March)
    - 2022 autumn (22 to 27 June)
    - 2022 winter (16 to 21 August)
    - 2022 spring (6 to 11 November)
    - 2023 summer (30 January to 4 February)
    - 2023 autumn (2 to 7 May 2023)
    - 2023 winter (10 to 15 August 2023)
    - 2023 spring (30 October to 4 November 2023).
- 2024 habitat quality surveys completed by three teams of two ecologists over four days between 16 and 19 April (refer Appendix E).
- 2025 targeted threatened species surveys, including yakka skink searches and ground-truthing habitat assessments, glossy-black cockatoo “ort” search, grey-headed flying-fox spotlighting surveys and targeted yellow-bellied glider (spotlighting, call playback, searches for feeding scars and ground-truthing habitat assessments) (refer Appendix T).

Survey methods, the number of surveys and the overall effort completed are shown in Table 3-4 and mapped in Part A2 Figures 3-3 to 3-8.

Specific survey effort for threatened and migratory fauna species potentially occurring within the Project Site is detailed in Table 3-5.

3.2.2.2.1 Bird and bat utilisation surveys

The bird utilisation survey was based on the Standard Bird Management Guideline for the Australian Wind Energy Association for initial site risk assessment, Level One Investigation (Brett Lane & Associates and Aria Professional Services, 2005). These guidelines outline a ‘Before – After – Control – Impact’ (BACI) experimental design as the best method to assess bird impacts at wind farms. The surveys conducted to date are the first step in a BACI design to quantitatively assess the bird use at the Project Site before the impact happens, both at the Project Site (impact sites) and at reference sites (control sites) in the surrounding areas.

Bird survey types included:

- roaming surveys
    - conducted in 2018
    - consisting of three transects of approximately 11.5 km carried out over three days

  - non-standardised and intended to familiarise with the site, record species numbers, location and behaviour, and further inform and refine plans for standardised point counts.
- fixed point count surveys
  - selected by dividing the Project Site into 800 m grid squares and randomly generating survey points within the grid, then visually assessing sites to ensure they were accessible and distributed throughout the site
  - initially (spring 2018 and autumn 2019 surveys), thirty fixed point count locations were selected (25 impact sites and 5 control sites), provides survey effort
  - the spring 2020, spring 2021, and 2022/2023 preconstruction surveys were refined from 30 survey locations down to 15 (11 impact sites and 4 control sites), this provides survey coverage of approximately 50% of the Project Site
  - within each survey period, each site was surveyed three times per day for 30 minutes (morning, midday, and afternoon), and the species, number, location, habitat, behaviour, flight direction, and height above ground was recorded for all birds observed.
- targeted searches for species listed as threatened (critically endangered, endangered, or vulnerable) or migratory under the EPBC Act
  - spotlighting and call playback for nocturnal species.
- opportunistic observations made during other fauna surveys and while traversing the Project Site
  - incidental sightings
  - water bird counts at farm dams
  - bird detections on camera traps installed as part of general fauna surveys.

Bat survey types included:

- acoustic recording (Anabat and Songmeter)
- harp trapping
- spotlighting for flying-fox (Pteropus) species
- targeted observational searches in areas of suitable habitat.

Table 3-4 Fauna survey methods and effort employed during field surveys

	Spring 2018		Autumn 2019		Spring 2020		Spring 2021		Summer 2022		Autumn 2022		Winter 2022		Spring 2022		Summer 2023		Autumn 2023		Winter 2023		Spring 2023		Autumn 2024		Autumn 2025		Total	
Survey method	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**
Habitat assessment	30	8 hrs x 2 pers.	34	17 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64	25 hrs x 2 pers.
Nocturnal spotlighting	-	-	23	34.5 hrs over 9 nights x 2 pers.	18	24 hrs over 6 nights x 2 pers.	41	24 hrs over 6 nights x 2 pers.	10	12 hrs over 6 nights x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	12.45 hrs x 2 pers. over 4 nights	112	106.95 hrs over 31 nights x 2 pers.
Microbat call recording	6	48 detection nights	9	27 detection nights	6	12 detection nights	8	15 detection nights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	102 detection nights
Microbat harp trapping	-	-	9	18 trap nights x 4 traps	9	18 trap nights x 4 traps	8	15 trap nights x 4 traps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	51 trap nights x 4 traps
Remote camera trapping for quoll	10	80 trap nights	20	88 trap nights	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30	168 trap nights
Black-breasted button-quail call playback	-	-	15	1.25 hrs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	1.25 hrs
Black-breasted button-quail active searches	7	1.75 hrs x 2 pers.	4	2 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	3.75 hrs x 2 pers.
Collared delma active searches	30	5 hrs x 2 pers.	39	8 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69	13 hrs x 2 pers.
Koala call playback	-	-	15	1.25 hrs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	1.25 hrs
Koala surveys (including SAT)	20	10 hrs x 2 pers.	19	9.5 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	39	19.5 hrs x 2 pers.
Fixed point count bird surveys	30	30 hrs x 2 pers.	30	45 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	15	22.5 hrs x 2 pers.	-	-	-	-	210	300 hrs x 2 pers.
Roaming surveys	3	6.75 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	6.75 hrs x 2 pers.
Dam waterbird searches	-	-	6	3 hrs x 2 pers.	13	3.25 hrs x 2 pers.	20	4.75 hrs x 2 pers.	11	2 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	13 hrs x 2 pers.

	Spring 2018		Autumn 2019		Spring 2020		Spring 2021		Summer 2022		Autumn 2022		Winter 2022		Spring 2022		Summer 2023		Autumn 2023		Winter 2023		Spring 2023		Autumn 2024		Autumn 2025		Total	
Survey method	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**	**No. sites**	**Survey effort**
South-eastern glossy black-cockatoo active searches	-	1.5 hrs x 2 pers.	34	11.5 hrs x 2 pers.	8	2 hrs x 2 pers.	7	1.75 hrs x 2 pers.	2	0.5 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.25 hrs x 2 pers.	52	17.5 hrs x 2 pers.
Habitat quality surveys -greater glider	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	10.5 hrs x 2 pers.	-	-	21	10.5 hrs x 2 pers.
Habitat quality survey – koala	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	17 hrs x 2 pers.	-	-	17	17 hrs x 2 pers.
Yellow bellied glider call playback	7	1.25 hrs x 2 pers.	15	1.25 hrs x 2 pers.	5	0.5 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	2.35 hrs x 2 pers.	34	5.35 hrs x 2 pers.
Yakka skink surveys	30	5 hrs x 2 pers.	34	8 hrs x 2 pers.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	1.73 hrs x 2 pers.	75	14.73 hrs x 2 pers.

Table 3-5 Survey effort for threatened and migratory fauna species potentially occurring within the Project Site

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
Threatened birds					
Anthochaera phrygia regent honeyeater	CE	Area searches in suitable habitat, preferably in the morning but other times may also be appropriate (DEWHA, 2010c). Detection by call is possible when birds are most vocal (outside the breeding season). Otherwise, detection is by sighting. Targeted searches of woodland patches with heavily flowering trees are useful, especially around water points such as dams and creek lines. Also check among flocks of other blossom nomads such as lorikeets and other honeyeaters. Broadcast surveys immediately before and during the breeding season may also be useful. For sites less than 50 ha, area searches at 20 hours over 10 days. Targeted searches in areas of heavily flowering trees and flocks of other blossom feeders for 20 hours over 5 days (DEWHA, 2010c).	No species-specific guidelines.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.**	Methods employed were considered sufficient to detect the presence of regent honeyeater at the site, if present.
Botaurus poiciloptilus Australasian bittern	E	No species specific guideline but the Commonwealth survey guidelines for threatened birds includes bitterns as part of the Inconspicuous sub-group of wetland birds (DEWHA, 2010c). There are no referral guidelines for this species. Broadcast surveys in suitable habitat for solicited call responses and sightings. Broadcast stations may be established at wetland edges to avoid damage to wetland vegetation. Stations should usually be at least 250 m apart (DEWHA, 2010c). Observation of targeted foraging habitat within wetlands in the early morning or early evening. Detection by sightings and unsolicited calls (DEWHA, 2010c). Area searches in suitable habitat for sightings, nests, indicative footprints and feathers (DEWHA, 2010c).	No species-specific guidelines.	General bird surveys included: Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 3 hrs by 2 experienced personnel across 6 sites. Total 96 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 3.25 hrs by 2 experienced personnel across 13 sites. Total 51.5 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 4.75 hrs by 2 experienced personnel across 20 sites. Total 54.5 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 2 hrs by 2 experienced personnel across 11 sites. Total 49 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs.	Methods employed were considered sufficient to detect the presence of Australasian bittern at the site, if present.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
				Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 6395 person hrs.**	
Geophaps scripta scripta squatter pigeon	V	Area searches or transect surveys in suitable habitat. Flushing surveys also likely to be useful (DEWHA, 2010c). In areas less than 50 ha area searches or transects for 15 hours over 3 days and flushing surveys for 10 hours over 3 days (DEWHA, 2010c).	No species-specific guidelines.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.** Extensive opportunities for incidental observations were presented while driving or walking around site.	Methods employed were considered sufficient to detect the presence of squatter pigeon at the site, if present.
Hirundapus caudacutus white-throated needletail (also migratory)	V, Mi	Counts of birds to be conducted by an experienced observer from elevated viewpoints (if present) during summer (DoE, 2015). Observations should be made of birds	No species-specific guidelines.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs.	No survey limitations identified. Methods suitable to detect species flying over site. Fixed point count bird surveys performed to collect

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
		coming into roost in tall trees and along ridge tops, but only if roost sites are known (DoE, 2015). For sites where there is a collision risk with wind turbines, more targeted surveys should include timed area counts and collision risk modelling (DoE, 2015).		Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.**	information about flight behaviours and collision risk. No roost sites were observed in the Project Site.
Turnix melanogaster black-breasted button-quail	V	Land based transect search (15 hrs / 3 days) in areas of less than 50 ha for suitable habitat, flushing birds, platelets and sounds of foraging (DEWHA, 2010c). No evidence of seasonal movement (Marchant and Higgins, 1993). Breeding season occurs from September to February/March (Hughes and Hughes, 1991; Smyth and Young, 1996). There are no referral guidelines for this species.	No species-specific guideline but searches for platelets (areas of scratching) and call playback are effective survey methods.	Spring 2018: Survey for 1.75 hrs by 2 personnel, searching for birds and platelets in suitable habitat. Survey completed within known breeding season. Total 3.5 person hrs. Autumn 2019: 4 active habitat searches were conducted in SEVT patches for platelet sign by 2 personnel over 2 hrs. 15 call playback surveys were conducted by 2 personnel for 5 mins per site for total of 1.25 hrs. Total 5.25 person hrs. **Total survey effort = 8.75 person hrs.** Extensive opportunities for incidental observations were presented while driving or walking around site and over 60 habitat assessments across the Project Site.	Only 8.75 hrs of targeted surveys for black-breasted button quail were completed when 15 hrs / 3 days is recommended. However, due to the small area of potential habitat available within the Project Site for this species (0.63 ha of vine thicket rainforest) and the complete avoidance of this area in the planning corridor, it is considered that a reasonable survey effort for this species has been achieved.
Stagonopleura guttata diamond firetail	V	This species is not in the Commonwealth survey guidelines for threatened birds. There are no referral guidelines for this species.	No species-specific guidelines.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed	No survey limitations identified. Methods suitable to detect species flying over site, if present. Fixed point count bird surveys performed to collect information about flight behaviours and collision risk. No roost sites were observed in the Project Site.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
				point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.**	
Calyptorhynchus lathami lathami south-eastern glossy black-cockatoo	V	This species is not in the Commonwealth survey guidelines for threatened birds. There are no referral guidelines for this species.	Diurnal bird survey involving a land based transect search through areas characteristic of she-oak *Allocasuarina* and *Casuarina* trees, with presence of suitable water bodies for drinking and also large hollow bearing eucalypts, used by this species during their breeding season. Targeted search for foraging and nesting signs. The colour of the chewed she-oak cone can determine how recent/old the feeding activity was. Sound detection of feeding e.g. the clicking sound of the bird's mandible can be heard and cones/branches falling to the ground (Hourigan, 2012). Proposed effort is 20-person hrs over 4 days. Calls are also made from begging young (Cameron, 2006). The birds are most active in the first and last two hours of daylight and although their calls are infrequent, they are most likely to be heard at these times. Peak breeding season occurs from March to August in SEQ (Glossy Black Conservancy, 2010).	Spring 2018: Active searches for habitat sign were conducted by two personnel over 1.5 hrs. Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 76.5 person hrs. Autumn 2019: 34 patches of vegetation containing she-oak were searched for orts by two personnel over 11.5 hrs. Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 113 person hrs. Spring 2020: 8 patches of vegetation containing she-oak were searched for orts by two personnel over 2 hrs. Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 49 person hrs. Spring 2021: 7 patches of vegetation containing she-oak were searched for orts by two personnel over 1.75 hrs. 2 adults birds observed incidentally. Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 48.5 person hrs. Summer 2022: 2 patches of vegetation containing she-oak were searched for orts by two personnel over 0.5 hrs. Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 46 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2025: Survey for 0.25 hrs by 2 personnel for one patch of she-oak searched for orts. Total 0.5 person hrs.	Methods employed were sufficient to confirm the presence of south-eastern glossy black-cockatoo at the site.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
				Total survey effort = 648.5 person hrs.	
Threatened mammals					
Dasyurus maculatus maculatus (SE mainland population) spot-tailed quoll, spotted-tail quoll, tiger quoll	E	Sampling units of 100 ha recommended due to wide range of species. Daytime search for suitable habitat, signs of activity, community consultation, latrine sites. Use of survey equipment such as hair sample device, camera traps. Cage trapping not required if prior methods used (DSEWPaC, 2011b). Mating occurs late May to early August through to September, males may be detected in areas where they usually do not occur. There are no referral guidelines for this species.	No species-specific guidelines.	Spring 2018: Baited remote camera trapping at 10 sites within suitable habitats for a total of 80 trapping nights. Habitat assessment surveys at 30 sites for 8 hrs by 2 personnel. Total 80 trap nights and 16 person hrs. Autumn 2019: Baited remote camera sites at 20 survey locations for a total of 88 trapping nights. Habitat assessment surveys at 34 sites for 17 hrs by 2 personnel. Total 88 trap nights and 34 person hrs. **Total survey effort = 168 camera trap nights and 50 person hrs.**	The increased metabolic demands and use of latrine sites during the breeding season (May to August) makes quolls more active and easier to detect during the breeding season. The spring and autumn surveys were completed outside the optimal survey period so may have resulted in a failure to detect the species. However, habitat surveys confirmed that limited habitat is present, so species is unlikely to occur within the site.
Phascolarctos cinereus koala	E	This species is not in the Commonwealth mammal survey guideline (DSEWPaC, 2011b). Habitat assessment – Koala habitat assessment tool (DoE, 2014b). Strip transects (DoE, 2014b). Nocturnal spotlighting (DoE, 2014b). SAT developed by (Phillips and Callaghan, 2011). Grid search over a study site. The size of the grid can vary depending on predicted koala density and habitat. Searching for scats (within a 1 m radius) of the base of 30 trees (with DBH greater than 10 cm) at each grid site (DoE, 2014b).	Survey requirements are: • SAT developed by (Phillips and Callaghan, 2011)	Spring 2018: koala rapid SATs were prioritised in RE 11.3.25 patches and secondary effort directed towards other habitats on low fertility soils. Survey effort of 10 hrs by 2 personnel. Habitat assessment surveys at 30 sites for 8 hrs by 2 personnel. Total 36 person hrs. Autumn 2019: Additional koala rapid SATs were conducted in suitable habitat. 19 surveys were completed by 2 personnel over 9.5 hrs. 23 nocturnal spotlight surveys were conducted by 2 personnel over 9 nights and 34.5 hrs. Habitat assessment surveys at 34 sites for 17 hrs by 2 personnel. Total 122 person hrs. Spring 2020: 24 hrs nocturnal spotlight surveys over 6 nights by 2 personnel. Total 48 person hrs. Spring 2021: 24 hrs nocturnal spotlight surveys over 6 nights by 2 personnel. Total 48 person hrs. Summer 2022: 12 hrs over 6 nights by 2 personnel. Total 24 person hrs. Incidental observations during all field survey periods over six years. **Total survey effort = 278 hrs.**	Methods employed were sufficient to detect koalas (across seasons), demonstrating that koalas occupy and use the site.
Nyctophilus corbeni Corben's long-eared bat	V	Survey techniques include harp traps and mist nets. Surveys most successful during warmer nights from October to April. For large scale projects traps and nets should be distributed across landscape to provide a good representation of habitat types Equipment should be situated in open fly-ways and within cluttered vegetation. Project areas of <50 ha it is recommended that a minimum of 5 surveying nights. A total effort of 20 trap nights when harp trapping and 20 mist-net nights is	No species-specific guidelines.	Spring 2018: Bat recording devices at 6 locations for 48 detection nights. Autumn 2019: Harp trapping at 9 locations for 18 total trapping nights using 4 traps each night. Bat recording devices at 9 locations for a total of 27 detection nights. Spring 2020: Harp trapping at 9 locations for 18 total trapping nights using 4 traps each night. Bat recording devices at 6 locations for a total of 12 detection nights. Spring 2021: Harp trapping at 8 locations for 15 total trapping nights using 4 traps each night. Bat recording devices at 8 locations for a total of 15 detection nights. **Total survey effort = 102 nights of call recording and 204 harp trapping nights.**	No harp trapping occurred in spring 2018. Heavy rain over 2 nights in autumn 2019 reduced the number of successful harp trapping nights from the recommended 20 nights to 18 nights. A further 18 trapping nights in spring 2020 and 15 in spring 2021 increased total effort to 51 harp trapping nights using 4 harp traps giving a total of 204 single harp trap nights across 26 locations.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
		recommended. However, trapping effort may need to be altered depending on survey locations (DEWHA, 2010b). Call recording devices can identify the genus but cannot reliably distinguish between *Nyctophilus* species. (DEWHA, 2010b) does not provide recommended survey effort for call recording. There are no referral guidelines for this species.			Effort sufficient to detect least concern *Nyctophilus* species (*N. geoffroyi*) during harp trapping.
Pteropus poliocephalus grey-headed flying-fox	V	Daytime field surveys for camps (DEWHA, 2010b). Surveys of vegetation communities and food plants (DEWHA, 2010b). Night time surveys walking transects (100 m apart), may include night-time audio recordings (DEWHA, 2010b). There are no referral guidelines for this species.	No species-specific guidelines. General survey requirements for mammals are relevant for the grey-headed flying-fox (Eyre *et al.*, 2018): Searches for flying fox camps (Eyre *et al.*, 2018): • Habitat assessment (plant food trees) • Spotlighting – 2 by 30 person mins spotlight search within 100 x 100 m, survey site.	Spring 2018: 30 habitat assessment sites were visited over 8 hrs by 2 personnel, where searches for flying fox camps occurred. Total 16 person hrs. Autumn 2019: 34 habitat assessment sites were visited over 17 hrs by 2 personnel, where searches for flying fox camps occurred. 23 nocturnal spotlight surveys over 9 nights and 34.5 hrs by 2 personnel. Total 103 person hrs. Spring 2020: 24 hrs nocturnal spotlight surveys over 6 nights by 2 personnel. Total 48 person hrs. Spring 2021: 24 hrs nocturnal spotlight surveys over 6 nights by 2 personnel. Total 48 person hrs. Summer 2022: 12 hrs over 6 nights by 2 personnel. Total 24 person hrs. Autumn 2025: 12.45 hrs nocturnal spotlight surveys over 4 nights by 2 personnel. Total 24.9 person hrs. Incidental observations during all field survey periods over six years. **Total survey effort = 263.9 hrs.**	Methods employed were sufficient to detect grey-headed flying-fox foraging within the site during the spring 2021 surveys.
Petaurus australis australis yellow-bellied glider	V	The Commonwealth guidelines include yellow-bellied glider (DSWEPAC, 2011b). Daytime searches for suitable habitat, den sites and food trees (including the characteristic V-shaped feeding scars (DSEWPaC, 2011b). Nocturnal spotlighting in suitable vegetation types (DSEWPaC, 2011b). Call playback surveys are suitable for yellow-bellied glider (DSEWPaC, 2011b).	No species-specific guidelines.	Spring 2018: No standardized nocturnal spotlight transect surveys were conducted due to time limitations. 7 nocturnal call playback sites conducted by 2 personnel over 1.25 hrs. Total 1.25 person hrs. Autumn 2019: 23 nocturnal spotlight transect surveys conducted by 2 personnel for 34.5 hrs over 9 nights. 15 nocturnal call playback sites conducted by 2 personnel over 1.25 hrs. Total 70.25 person hrs. Spring 2020: 18 nocturnal spotlight transect surveys conducted by 2 personnel for 24 hrs over 6 nights. 5 nocturnal call playback sites conducted by 2 personnel over 0.5 hrs, Total 48.5 person hrs. Spring 2021: 41 nocturnal spotlight transect surveys conducted by 2 personnel for 24 hrs over 6 nights. Total 48 person hrs Summer 2022: 10 nocturnal spotlight transects 12 hrs over 6 nights by 2 personnel. Total 24 person hrs. Autumn 2025: 12.45 hrs nocturnal spotlight and call playback surveys over 4 nights by 2 personnel. 7 nocturnal call playback sites conducted by 2 personnel over 2.35 hrs over 3 nights. Total 29.6 person hrs. **Total survey effort = 221.6 hrs**	Methods employed were considered sufficient to detect the presence of yellow-bellied glider at the site, if present. Survey effort was sufficient and able to detect other species of glider, including greater glider, sugar glider and squirrel glider, through both spotlighting and call playback.
Petauroides volans greater glider	E	This species is not in the Commonwealth survey guideline (DSEWPaC, 2011b). For the purposes of this assessment the survey guidelines for similar sized arboreal	Bright moonlight negatively influences detectability (Eyre *et al.*, 2018). Does not readily vocalise, detections based on sightings	Spring 2018: No standardized nocturnal spotlight transect surveys were conducted due to time limitations. Autumn 2019: 23 nocturnal spotlight transect surveys conducted by 2	Methods employed were sufficient to confirm the presence of greater glider (southern and central) at the

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
(southern and central)		mammals (i.e. mahogany glider and fluffy glider) were considered. Daytime searches for suitable habitat, den sites and food trees (DSEWPaC, 2011b). Nocturnal spotlighting in suitable vegetation types (DSEWPaC, 2011b). There are no referral guidelines for this species.	Easy to detect via spotlight as they stare at intruders for long periods of time and have bright eye-shine (DoSE, 2011). Standardized spotlight surveys recommended: • On foot, 1 km transects, to maximize coverage of study site, along or off a track. • Conducted well after dark, may not emerge from hollows as early as other species. • Under optimal conditions (high habitat quality, warm temperatures and no rain, fog or bright moonlight) a minimum of 2 repeat visits is recommended for a 40 min / 2 ha transect (Wintle *et al.*, 2005). • Lower quality habitat and/or under colder temperatures, five or more repeat visits of the 40 min / 2 ha transect are needed to provide an equivalent probability of detection (Wintle *et al.*, 2005).	personnel for 34.5 hrs over 9 nights. Total 69 person hrs. Spring 2020: 18 nocturnal spotlight transect surveys conducted by 2 personnel for 24 hrs over 6 nights. Total 48 person hrs. Spring 2021: 41 nocturnal spotlight transect surveys conducted by 2 personnel for 24 hrs over 6 nights. Total 48 person hrs Summer 2022: 10 nocturnal spotlight transects 12 hrs over 6 nights by 2 personnel. Total 24 person hrs. Autumn 2025: 12.45 hrs nocturnal spotlight surveys over 4 nights by 2 personnel. Total 24.9 person hrs. **Total survey effort = 213.9 hrs.**	site.
Threatened reptiles					
Egernia rugosa yakka skink	V	Commonwealth guidelines include this species (DSWEPAC 2011). Yakka skink is most active during the early morning and late afternoon, with some recorded on warm nights Searches should target burrows and latrine sites, by distant observation or shining a torch down burrows at night. Elliot trapping around burrows can be effective.	Colonies can be detected at any time of year, but detectability increases during warmer, drier months when activity levels at the burrow complex increase (Ferguson and Mathieson, 2014). Evidence of activity such as burrow entrances, latrine sites and basking platforms are easily removed by rain and it is recommended surveys occur at least two weeks after heavy rain. • Diurnal searches within suitable microhabitats – 10 ha per 50 ha of suitable habitat; 1 survey • Distant observation – 20 minutes scanning suitable microhabitat over 3 days • Camera traps may not always trigger but 4 nights during warmer months (12 cameras per colony) is recommended • Funnel traps – 60 trap nights per colony over 4 nights.	There is marginal suitable habitat within the Project Site. Targeted herpetofauna surveys included: Spring 2018: 10 minutes of active searches at 30 habitat assessment sites (5 hrs by 2 personnel at 30 sites). Total 10 person hrs. Autumn 2019: 5 active herpetofauna searches over 2.5 hrs by 2 personnel. 10 minutes of active searches at 34 habitat assessment sites over 5.5 hrs by 2 personnel. Total 16 person hrs. Autumn 2025: 11 active herpetofauna searches over 1.73 hrs by 2 personnel. Total 3.46 person hrs. **Total survey effort = 29.5 hrs**	Methods employed were sufficient to detect the presence of yakka skink at the site, if present. Surveys completed during suitable conditions.
Delma torquata collared delma	V	Survey guidelines for Australia's threatened reptiles (DSEWPaC, 2011c) suggest pitfall trapping (6 x 4-10 L buckets over 15 m fence with funnel traps). However, draft referral guidelines for threatened brigalow belt reptiles (DSEWPaC, 2011a) do not recommend pitfall trapping for this species. Both guidelines recommend active searching in appropriate habitats (one off searches) including raking through leaf litter (DSEWPaC, 2011c, 2011a).	No species-specific guidelines. General survey requirements for reptiles that would be relevant are (Eyre *et al.*, 2018): • Pitfall trapping: 4 buckets at 7.5 m intervals T design, 45 m fence / 4 nights. • Funnel trapping: 6 funnels at 3 m intervals on distal ends of T-design 45 m fence for 4 nights. • Diurnal active searches - 2 by 30 person min search within 2 different 50 x 50 m quadrats. • Nocturnal active searches - 2 by 30 person-min searches within the 100 x 100 m survey site. • Scat and sign search - 2 by 30 person min search within 2 different 50 x 50 m quadrats.	Spring 2018: 10 minutes of active searches at 30 habitat assessment sites (5 hrs by 2 personnel). Total 10 person hrs. Autumn 2019: 5 active herpetofauna searches over 2.5 hrs by 2 personnel. 10 minutes of active searches at 34 habitat assessment sites over 5.5 hrs by 2 personnel. Total 16 person hrs. Autumn 2025: 11 active herpetofauna searches over 1.73 hrs by 2 personnel. Total 3.46 person hrs. **Total survey effort = 29.5 hrs.**	Species is unlikely to occur on site. Some rocky hillsides are present, but not within preferred sedimentary landzones (9 and 10). No pitfall trapping was therefore considered necessary.
Migratory fauna					
Apus pacificus fork-tailed swift	Mi	Counts of birds to be conducted by an experienced observer from elevated viewpoints (if present) during summer (DoE, 2015). Fork-tailed swifts have distinctive vocalisations which may be recognised by an experienced observer (DoE, 2015). For sites where there is a collision risk with wind turbines, more targeted surveys should	No species-specific guideline.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs.	Methods employed were sufficient to confirm the presence of fork-tailed swift at the site.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
		include times area counts and collision risk modelling (DoE, 2015).		Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.**	
Plegadis falcinellus glossy ibis	Mi	No species specific guidance but behaviour and life cycle requirements similar to Inconspicuous sub-group of wetland birds in the Commonwealth survey guidelines for threatened birds (DEWHA, 2010c). Broadcast surveys in suitable habitat for solicited call responses and sightings. Broadcast stations may be established at wetland edges to avoid damage to wetland vegetation. Stations should usually be at least 250 m apart. Observation of targeted foraging habitat within wetlands in the early morning or early evening. Detection by sightings and unsolicited calls. Area searches in suitable habitat for sightings, nests, indicative footprints and feathers.	No species-specific guidelines.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 3 hrs by 2 experienced personnel across 6 sites. Total 96 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 3.25 hrs by 2 experienced personnel across 13 sites. Total 51.5 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 4.75 hrs by 2 experienced personnel across 20 sites. Total 54.5 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Waterbird surveys for 2 hrs by 2 experienced personnel across 11 sites. Total 49 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed	Methods employed were considered sufficient to detect the presence of glossy ibis at the site, if present.

Name	EPBC status	Commonwealth survey guidelines / EPBC Act referral guidelines	Queensland survey guidelines	Effort and method carried out by Ecosure & SLR	Survey results and limitations
				point bird count techniques. Total 45 person hrs. **Total survey effort = 639.5 person hrs.**	
Cuculus optatus oriental cuckoo	Mi	The guidelines for the oriental cuckoo and five migrant flycatchers recommend area surveys, preferably 20 minutes per 2 ha (DoE, 2015). Observers should be sufficiently skilled to recognise calls as well as counting birds detected by sight. Surveys to be undertaken in spring or summer (DoE, 2015). During migration periods (spring and autumn), surveys should consider habitat suitable and important for migration passage (DoE, 2015).	No species-specific guideline.	Spring 2018: Survey for 30 hrs by 2 experienced personnel, using fixed point bird count techniques. Roaming surveys for 6.75 hrs by 2 personnel. Total 73.5 person hrs. Autumn 2019: Survey for 45 hrs by 2 experienced personnel using fixed point bird count techniques. Total 90 person hrs. Spring 2020: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2021: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2022: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Summer 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Winter 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Autumn 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. Spring 2023: Survey for 22.5 hrs by 2 experienced personnel using fixed point bird count techniques. Total 45 person hrs. **Total survey effort = 613.5 person hrs.**	Methods employed were considered sufficient to detect the presence of oriental cuckoo at the site, if present.

3.2.2.2.2 Koala habitat assessments

Section 5.2 of the PER Guidelines outlines specific considerations for koala and these are addressed in Section 3.4.1. The koala habitat assessment is discussed in detail and summarised in Section 3.4.1.5.

Potential koala habitat was initially modelled using the ground-truthed vegetation communities of remnant and HVR known to contain koala food trees. Additional detailed surveys for koala were undertaken in 2024 to inform modelling of habitat which considered:

- The Conservation Advice for *Phascolarctos cinereus* (koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022c).
- Identifying habitat for the endangered koala (DCCEEW, 2024e).
- A review of koala habitat assessment criteria and methods (Youngentob, Marsh and Skewes, 2021).
- The National recovery Plan for the koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE, 2022d).

To supplement available data used to inform koala habitat modelling, an additional 17 habitat quality assessment sites within the Project Site were assessed with plots of 50 x 100 m traversed and the number of the following trees recorded:

- LIKT (greater than 10 cm DBH)
- AKHT (greater than 10 cm DBH).

Data relating to the topography, level of disturbance and vegetation structure was also captured, in additional to general BioCondition data. These data, along with ground-truthed vegetation and fauna habitat data, aerial imagery, and historical clearing data, have been used to map koala habitat across the Project Site. The koala habitat has been mapped into four main categories: Preferred foraging and Breeding habitat, General habitat (lower quality foraging and breeding habitat), dispersal habitat and unsuitable habitat. The definitions of these habitats and the habitat mapping methodology is detailed further in Section 3.3.1.

3.2.2.2.3 Greater glider habitat assessment

Section 5.2 of the PER Guidelines outlines specific considerations for greater glider which are addressed in Section 3.4.2. The koala habitat assessment is discussed in detail and summarised in Section3.4.2.7.

Greater glider habitat was originally modelled using ground-truthed vegetation communities of remnant and HVR containing eucalypt forest and woodland. This was refined to identify preferred habitat which contains REs with confirmed greater glider records (as identified by Eyre et al., 2022) and habitat attributes including denning and feed trees and connectivity across the landscape. Potential habitat is defined (Eyre *et al.*, 2022) using REs without greater glider records but containing habitat attributes including denning and feed trees and connectivity across the landscape. To confirm the presence of suitable food and denning trees across the Project Site, additional surveys were undertaken in 2024 and tree size, rather than hollow presence or absence, was recorded due to the correlation between tree diameter size and the presence of (Eyre *et al.*, 2022). Trees with a DBH greater than 30 cm are preferentially selected for foraging while trees with a DBH greater than 50 cm are more likely to provide suitable tree hollows for greater glider use (Eyre *et al.*, 2022). Non-remnant vegetation which contains foraging resources and future denning trees were identified as Potential habitat.

3.3 MNES habitat assessment

The results of an updated 18 March 2025 PMST search (refer Appendix R) were used to update the list of species provided in the PER Guidelines. Species records and habitat assessments from all field surveys and literature review were used to review and update the likelihood of occurrence assessment as appropriate (see Table 3-6 and Table 3-7). The habitat potential of the Project Site was assessed for all threatened or migratory species identified in the likelihood of occurrence assessment, as confirmed within the Project Site, considered likely or possible to occur.

Species confirmed within the Project Site or considered likely to occur based on habitat availability and species records were considered further for detailed assessment of suitable habitat and assessment of potential impacts. In this section, the known ecology and habitat requirements of the species are considered (with particular reference to Commonwealth conservation advice and recovery plans relevant to the species), their occurrence in and adjacent to the Project Site is discussed and potential habitat available for the species across the Project Site is mapped.

Fauna species listed under the EPBC Act as threatened or migratory and confirmed or likely to occur in the Project Site are:

- koala (endangered)
- greater glider (southern and central) (endangered)
- white-throated needletail (vulnerable and migratory)
- grey-headed flying-fox (vulnerable)
- south-eastern glossy black-cockatoo (vulnerable)
- fork-tailed swift (migratory).

Two flora species Austral toadflax and wandering peppercress, and one fauna species, yellow-bellied glider have also been subjected to further assessment, even though the species is only considered possible (considerate of recent survey data) to occur within the Project Site.

All other species were considered either possible or unlikely based on the likelihood of occurrence assessment. The full likelihood of occurrence assessment is outlined in Table 3-6 below. A summary of the outcomes of all species identified in Table 3-1 of this chapter is presented in Table 3-6 below. No threatened ecological communities (TECs) were identified as occurring within the Project Site.

The likelihood of occurrence assessment (refer Table 3-6) relies on the following key:

- EPBC Act Status:
- CE – critically endangered
- E – endangered
- V – vulnerable
- Mi – migratory
- Likelihood of occurrence:
    - Confirmed – the species or signs of their presence were observed during the field survey
    - Likely – the site contains habitat that is suitable for the species and Wildnet has recent records of the species (i.e. since 1980) within 10 km of the site
    - Possible – the site contains habitat that is suitable for the species, but Wildnet has no recent records of the species within 10 km of the site; or the site contains marginal / low quality habitat for the species and Wildnet has recent records of the species within 10 km of the site
    - Unlikely – the site contains marginal / low quality or no habitat for the species and Wildnet has no recent records of the species within 10 km of the site.
- Source:
    - E – EPBC Act protected matters search
    - W – wildlife online database search.
- Marginal / low quality habitat – habitat that although meeting the broad habitat description is poor in quality, occupies a small area, is outside the known species range and is generally unsuitable to sustain the species.

Table 3-6 Likelihood of occurrence assesment

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
Fauna					
Actitis hypoleucos	common sandpiper	Mi	Around coastal wetlands and some inland wetlands on the muddy margins or rocky shores. Also inhabits estuaries, deltas of streams, lakes, pools, billabongs, reservoirs, dams and claypans.	**Unlikely**. Limited marginal habitat available onsite. No Wildnet records within 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Anomalopus mackayi	five-clawed worm skink	V	Known to occur in both remnant and non-remnant woodlands and grasslands on alluvial cracking clays or self-mulching friable basalt soils in NSW and QLD, occurring on REs 11.3.21, 11.3.25, 11.8.5, 11.8.15, 13.3.3, 13.3.4 associated non-remnants. They have also been found in areas modified by agriculture and other human activities. This species has been found sheltering under artificial materials lying flat on the ground.	**Unlikely**. Limited marginal habitat available onsite. No Wildnet records within 10 or 20 km.	E
Anthochaera phrygia	regent honeyeater	CE	Commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, may inhabit riparian vegetation and lowland coastal forest. Mainly a canopy species it is reliant on select species of eucalypt and mistletoe which provide rich nectar (Commonwealth of Australia, 2016).	**Possible**. Suitable habitat on site and no records within 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Apus pacificus	fork-tailed swift	Mi	The fork-tailed swift is a non-breeding migrant to Australia. It is widespread across Australia and territories arriving in north-west Australia in October and November. Almost exclusively aerial from <1 m to 1,000 m. Most observed over inland plains in Australia but sometimes recorded over coastal cliffs and beaches as well as urban areas.	**Confirmed**. Present in a wide range of habitats and may overfly the site. Three individuals sighted in fixed point surveys. No Wildnet records within 10 km but four records within 20 km.	E
Botaurus poiciloptilus	Australasian bittern	E	The Australasian bittern can be found in habitats containing reedbeds, and other vegetation in water such as cumbungi, lignum and sedges (BirdLife Australia, 2024).	**Possible**. Limited suitable habitat on site. No records within 10 km, but one Wildnet record within 20 km to the north adjacent to Gordonbrook Dam in 1984. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	W
Calidris acuminata	sharp-tailed sandpiper	V, Mi	Edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation, lagoons, swamps, lakes and pools near the coast, dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes, saltworks, sewage farms, flooded paddocks, sedge lands, ephemeral wetlands, but leave when they dry (Morcombe, 2004).	**Unlikely**. Marginal habitat onsite. No Wildnet records within 10 km, but 3 records within 20 km. No detections during dam surveys, 24 months of BUS, roaming surveys and opportunistic sightings.	E, W
Calidris ferruginea	curlew sandpiper	CE, Mi	Intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, non-tidal swamps, lakes and lagoons, ponds in saltworks, sewage farms, ephemeral and permanent lakes, dams, waterholes and bore drains (Pizzey and Knight, 2012).	**Unlikely**. No suitable habitat onsite. No Wildnet records within 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Calidris melanotos	pectoral sandpiper	Mi	In Australasia, the pectoral sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands (DCCEEW, 2025).	**Unlikely**. No suitable habitat onsite. No Wildnet records within 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Calyptorhynchus lathami lathami	glossy black-cockatoo	V	The glossy black cockatoo is highly dependent on *Allocasuarina* species (Higgins, Peter and Steele, 2001). It inhabits open forest and woodlands on the coastline as well as within the Great Dividing Range where stands of sheoak (especially *Allocasuarina littoralis* and *Allocasuarina torulosa*). Inland populations feed on a wide variety of sheoaks including drooping sheoak, *Allocasuarina diminuta*, *Allocasuarina gymnanthera* and belah (OEH, 2022). 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, Peter and Steele, 2001).	**Confirmed**. Suitable foraging habitat exists in patches within the Project Site. Two individuals were observed roosting beside a dam onsite, a further five were sighted during fixed point surveys, and evidence of feeding found (22 detections). There are records of this species and evidence of their activity has been recorded from areas adjacent the Project Site over several years (Golder Associates, 2018).	E, survey results
Chalinolobus dwyeri	large-eared pied bat	E	The species has been found roosting in caves, overhangs, abandoned mine tunnels and disused fairy martin nests (Hoye and Dwyer, 1995; Schulz, 1998). No evidence exists of the large-eared pied bat roosting in tree hollows (DETSI 2025).	**Unlikely**. Limited marginal habitat onsite and no Wildnet records within 10 or 20 km. No detections during surveys.	E

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
Climacteris picumnus victoriae	brown treecreeper (south-eastern)	V	Found in eucalypt woodlands and dry open forests of the inland slopes and plains inland of the Great Dividing Range. Northernmost known range is in the Bunya Mountains, Queensland. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) forest (OEH, 2024).	**Unlikely**. No Wildnet records within 10 or 20 km. Marginal suitable habitat on-site, but Project Site is outside of known species range.	E
Cuculus optatus	oriental cuckoo	Mi	Mainly inhabiting forests, the oriental cuckoo occurs in mixed, deciduous and coniferous forest. It is present at all levels of the forest canopy, and can be found at a range of elevations, occasionally being recorded in mountains as high up as 1,100 metres (Higgins, 1999).	**Possible**. Present in a wide range of habitats, and suitable habitat for the species is present on the Project Site. No Wildnet records within the 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	CE	Habitat includes rainforests, adjacent eucalypt woodlands, coastal scrub and riparian vegetation (Pizzey and Knight, 2012). Coxen's fig-parrot occurs wherever fig trees are present in lowland and upland forest types, riparian corridors, farmland and urban environments. It feeds primarily on the seeds of figs (DCCEEW, 2023a).	**Unlikely**. No suitable habitat onsite and no confirmed records within 10 km. One citizen science record exists from Kumbia (ALA 2020); however this is likely to be erroneous and has not been confirmed by other reputable sources.	E
Dasyurus hallucatus	northern quoll	E	The northern quoll is commonly found in a wide range of eucalypt forest and woodland habitats associated with steep dissected rocky terrain, also found in rainforest patches, vegetation along creek lines, adjacent to mangroves, around human settlement and on beaches (DCCEEW, 2025).	**Unlikely**. Limited marginal habitat onsite and no records within 10 km. Two records are about 20 km south of site in very different montane habitat in the Bunya Mountains. Not detected during camera trapping and spotlighting surveys.	E, W
Dasyurus maculatus maculatus	spotted-tail quoll	E	The southern subspecies, spotted-tail quoll, has been recorded from a wide range of habitat types including rainforest, wet and dry sclerophyll forest, coastal heathland, scrub and dunes, woodland, heathy woodland, swamp forest, mangroves, on beaches and sometimes in grassland or pastoral areas adjacent to forested areas (Threatened Species Scientific Committee, 2020).	**Unlikely**. Limited marginal habitat onsite. One Wildnet record from 1930 within 10 km from Kumbia, but this area is now extensively cleared. Nearest recent records are about 20 km south of the site in very different montane habitat in the Bunya Mountains. Not detected during camera trapping and spotlighting surveys.	E, W
Delma torquata	collared delma	V	This species is endemic, recorded disjunctly from the western edges of Brisbane north-west to Blackdown Tableland and inland to the Roma area (Wilson and Swan, 2014). This species habitat is associated with rocky terrain; however this species has also been recorded in woodlands with no significant rock components (Wilson and Swan, 2014). Habitat includes open eucalypt forest with a sparse understorey of shrubs and tussock grasses, on rocky hillsides with flattish rocks or on deep-cracking soils. Associated with land zones 3, 9 and 10 and specifically, RE 11.3.2, 11.9.10, 11.10.1 and 11.10.4.	**Unlikely**. Preferred REs not present on-site. No rocky areas observed in land zones 3, 9 or 10. Several areas of scree slopes were identified in land zone 8 and 11, which may provide marginal habitat. No Wildnet records within 10 km. Nearest records are about 20 km south of site in very different montane habitat in the Bunya Mountains. Not detected during active searches in woodland habitats.	E, W
Egernia rugosa	yakka skink	V	Known distribution extends from the coast to the hinterland of sub-humid to semi-arid Queensland. Core habitat is within the Mulga Lands and Brigalow Belt South Bioregions. Occurs in open dry sclerophyll forests (ironbark) or low woodland and open shrub land on RE land zones 3, 4, 5, 7, 8, 9, 10 and 12 (though land zone 8 not considered core habitat and land zone 12 in Wet Tropics bioregion only). Has also been recorded in lancewood forest on coarse gritty soils in the vicinity of low ranges, foothills and undulating terrain with good drainage (DCCEEW, 2025). Colonies have been found in large hollow logs, cavities or burrows under large fallen trees, tree stumps, logs, stick-raked piles, large rocks and rock piles, dense ground-covering vegetation, and deeply eroded gullies, tunnels and sinkholes (DCCEEW, 2025).	**Possible**. Marginal suitable habitat within the Project Site. No Wildnet records within 10 or 20 km. No species detections during targeted herpetofauna and species-specific surveys (2018 – 2025) of suitable habitat.	E
Elseya albagula	southern snapping turtle	CE	Prefers clear flowing water but can occur in non-flowing water. Known from Wide Bay Creek and Mary River.	**Unlikely**. All records are from much further downstream, no Wildnet records within 10 or 20 km.	E
Erythrotriorchis radiatus	red goshawk	E	Typically occurs in woodland and forests in subtropical and warm temperate regions of Australia (Marchant and Higgins, 1993). It prefers landscapes that contain a mix of habitats including coastal and sub-coastal tall open forest, woodland and rainforest edges. Resident pairs of red goshawks prefer intact, extensive woodlands and forests with a mosaic of vegetation types that are open enough for fast manoeuvring flight (Marchant and Higgins, 1993). These favoured areas contain permanent water, are relatively fertile and biologically rich with large populations of birds. Such areas are also preferentially selected for agricultural development (Sattler and Williams, 1999). Nests are typically built at an average height of 20 m (DCCEEW, 2023b).	**Unlikely**. Marginal habitat onsite, nearest record is from the Nanango area approximately 50 km east of the Project Site.	E

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
Falco hypoleucos	grey falcon	V	Inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses.	**Unlikely**. Limited marginal habitat and no records within 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Furina dunmalli	Dunmall's snake	V	This species occurs near the Queensland border in the brigalow belt south and Nandewar regions (DSEWPaC, 2011b). Habitat for this species includes forest and woodlands on cracking clays and clay loams dominated by brigalow (*Acacia harpophylla*), other wattles (*A. burrowii, A. deanii*, *A. leiocalyx*), and native Cypress (*Callitris* spp.). Little is known about this species ecological requirements, however it is suggested that fallen timber, ground litter, and cracks in alluvial soils provide shelter for this species (DSEWPaC, 2011b).	**Unlikely**. No suitable habitat within the Project Site. Not detected during active herpetofauna searches. No Wildnet records within 10 km, and one record within 20 km.	E, W
Gallinago hardwickii	Latham's snipe	V, Mi	Latham's snipe is a non-breeding migrant to the south-east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. Usually seen in small groups or singly in freshwater wetlands on or near the coast (Pizzey and Knight, 2012).	**Unlikely**. No suitable waterbodies onsite. No Wildnet records within 10 or 20 km.	E
Geophaps scripta scripta	squatter pigeon	V	The squatter pigeon is regionally abundant within the Brigalow Belt (northern) and Desert Uplands Bioregions. The species occurs in a wide range of habitats wherever there is a grassy understorey. It is commonly encountered in grassy woodlands and open forests dominated by eucalypts (DCCEEW, 2025). It is nearly always associated with areas with nearby permanent water (e.g. rivers, creeks and waterholes). Sandy areas dissected by gravel ridges, which have open and short grass cover allowing easier movement, are preferred. It is less commonly found on heavier soils with dense grass (DCCEEW, 2024b).	**Possible**. Suitable habitat is present within the Project Site, however no Wildnet records within 10 km or 20 km. No detections across any surveys between 2018-2025 or during specific bird surveys including, dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Grantiella picta	painted honeyeater	V	Forests, woodlands, dry scrublands often with abundant mistletoe. Key habitat is defined as brigalow and gidgee (with mistletoe), including REs 11.3.1, 11.3.1a, 11.3.1b, 11.3.1c, 11.3.16, 11.3.17, 11.3.20, 11.4.3, 11.4.3a, 11.4.3b, 11.4.3c, 11.4.7, 11.4.10, 11.9.5, 11.9.6, 11.9.6a, and 11.9.10 (DETSI, 2025).	**Unlikely**. No suitable habitat exists onsite and no records within 10 km. One Wildnet record within 20 km. Many records from the wider locality (ALA 2022). No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E, W
Hemiaspis damelii	grey snake	E	Found on the inland eastern interior to the Rockhampton coastal region. Inhabits fallen timber and soil cracks, usually near water (Wilson and Swan, 2014). Occurs from central inland NSW to coastal areas near Rockhampton. Inhabits brigalow and belah woodlands on cracking clay soils in association with water bodies, small gullies, ditches and gilgais as they prey almost exclusively on frogs (Rowland, 2012).	**Unlikely**. No suitable habitat within the Project Site and no Wildnet records within 10 or 20 km. Not detected during active herpetofauna searches.	E
Hirundapus caudacutus	white-throated needletail	V, Mi	The white-throated needletail is a non-breeding migrant to Australia (present October-April). It is widespread across eastern and south-eastern Australia but is considered a vagrant in central and western Australia. White-throated needletails are aerial birds, utilising the airspace above forests, woodlands, farmlands and ridge tops (Pizzey and Knight, 2012).	**Confirmed**. Numerous individuals recorded during fixed point count surveys from 2018 - 2023. Likely to fly over the site. No observations of roosting onsite. Four Wildnet records within 20 km.	E, W, survey results
Hydroprogne caspia	Caspian tern	Mi	Mostly found in sheltered coastal areas and may also occur on near-coastal or inland terrestrial wetlands that are either fresh or saline.	**Unlikely**. No suitable habitat on site and no Wildnet records within 10 km. One Wildnet record within 20 km.	W
Lathamus discolor	swift parrot	CE	Dry sclerophyll eucalypt forests and woodlands. Occasionally wet sclerophyll forests. Feeds mostly on nectar, mainly from eucalypts, but also eats psyllid insects and lerps, seeds and fruit.	**Unlikely**. No suitable habitat onsite and no records within 10 or 20 km.	E
Maccullochella peelii	Murray cod	V	Diverse range of habitats within the Murray-Darling River system from clear rocky streams to slow-flowing, turbid lowland rivers and billabongs (DCCEEW, 2025).	**Unlikely**. The Project area is located within the Burnett drainage basin and there are no Wildnet records within 10 or 20 km.	E
Motacilla flava	yellow wagtail	Mi	Variety of habitat types from farmland to wet pastures and grasslands.	**Unlikely**. Habitat is suitable, but no Wildnet records within 10 or 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E
Nyctophilus corbeni	Corben's long-eared bat, south-eastern long-eared bat	V	Variety of vegetation types, including mallee, bulloak and box / ironbark eucalypt dominated communities. Requires hollows for roosting and prefers large, intact and connected habitat patches (DCCEEW, 2024d). The species is found to increase in abundance in habitats with a distinct tree canopy and dense, cluttered understorey layer (Turbill and Ellis, 2006).	**Unlikely**. Marginal habitat and no records from within 10 or 20 km. Harp trapping surveys within areas of potential habitat did not detect this species.	E

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
Pandion cristatus (listed as *P. haliaetus*)	eastern osprey	Mi	Occur in littoral and coastal habitats and terrestrial wetlands and occasionally travel inland along major rivers. Require extensive areas of open fresh, brackish or saline waters.	**Unlikely**. No rivers with permanent water occur. No Wildnet records within 10 km but one record within 20 km.	E, W
Petauroides volans volans	central greater glider	E	Tall eucalypt forests and woodlands. Silent, solitary and nocturnal. Eats gum leaves. Dependent on large tracts of undisturbed, tall forest with suitably large nesting hollows; each animal requires approximately 1.5 ha (DCCEEW, 2022).	**Confirmed**. Suitable habitat exists onsite and Wildnet records within 20 km. A total of 76 individuals were detected during spotlighting surveys (36 within the Project Site).	E, W, survey results
Petaurus australis australis	yellow-bellied glider	V	Occurs at altitudes ranging from sea level to 1,400 m above sea level and has a widespread but patchy distribution from SEQ to far south-eastern South Australia, near the South Australia to Victorian border (DAWE, 2022a). In Queensland distribution is mostly coastal, extending southward along the eastern seaboard from north of Mackay to the Queensland border. Inhabits tall mature eucalypt forest (either wet or dry forest) and shelters in hollows (DAWE, 2022a). The distribution is highly disjunct due to a combination of biogeographic processes and land clearing, as well as the specific habitat requirements, even in continuous sections of forest (Eyre 2004). Species generally occur in small social groups that occupy large and exclusive home ranges and occur at low densities (0.03-0.14 individuals/ha). Yellow-bellied glider shows a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter (DAWE, 2022a). Home ranges are large due to the dispersed nature of foraging trees and the seasonal changes in use (DAWE, 2022a). It is suggested by Goldingay and Possingham (1995) that minimum habitat areas of 180–350 km^2 are required to maintain a viable subpopulation with a figure of 320 km^2 suggested for south east Queensland (Eyre, 2002). Habitat corridors are required to facilitate dispersal of yellow-bellied glider between fragmented habitat patches and/or to enable recolonization or movement away from threats (DAWE, 2022). This species has very low dispersal capabilities which reinforces its dependence on contiguous areas of forest (DAWE, 2022). Yellow-bellied glider has previously been recorded in the region (e.g. within 80 km of the Project Site Diamondy State Forest [14,200 ha], Barakula State Forest [283,500 ha], Tarong State Forest [1,500 ha] and Squirrel Creek State Forest [8,655 ha]) where there are large continuous patches of habitat.	**Possible**. Marginal habitat exists within the Project Site due to the absence of large contiguous patches of mature old growth forest. No WildNet records exist within 10 km but two records within 20 km (see habitat description). There were no detections during targeted surveys for this species. A total of 219.6 hrs were spent spotlighting and conducting call playback for yellow-bellied glider between 2019 - 2025, along with more than 64 habitat assessment sites and extensive vegetation surveys identifying flora diversity, including key foraging trees for the species. Additionally, no V-shaped feeding scars (which are characteristic of yellow-bellied gliders (Goldingay and Kavanagh 1991)) were detected on any suitable foraging trees during targeted surveys or habitat assessments across the Project Site. High numbers of other glider species were detected on site, indicating that suitable habitat features for gliders are present in the form of den sites and foraging species. However, the absence of sufficiently large contiguous patches of forest required by this yellow-bellied glider has limited the suitability of the site to marginal at best. Based on these findings, and the fragmented nature of the Project Site compared to the large continuous patches of habitat where known records of yellow-bellied glider have previously been recorded in the region, there is a low likelihood of this species occurring within the impact area or Project Site.	E
Petrogale penicillata	brush-tailed rock-wallaby	V	Prefers steep rocky habitats, with high importance on rocky outcrops and north facing aspects. Occurs in a range of vegetation types from rainforest to open forest.	**Unlikely**. No habitat onsite and no Wildnet records from within 10 or 20 km.	E
Phascolarctos cinereus	koala	E	A range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by *Eucalyptus* species – food and shelter trees (DAWE 2022b).	**Confirmed**. Fauna surveys have recorded numerous individual sightings as well as scats and scratches. Suitable habitat and nine Wildnet records within 10 km.	W, E, survey results
Plegadis falcinellus	glossy ibis	Mi	Fresh water marshes near the edges of lakes and rivers, lagoons, flood-plains, swamps, reservoirs, sewage ponds and cultivated areas under irrigation (DCCEEW, 2025).	**Possible**. Some suitable habitat exists on the Project Site. No Wildnet records within 10 km but three records within 20 km. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	W
Potorous tridactylus tridactylus	long-nosed potoroo	V	Fragmented distribution along the east coast mainland. Inhabits coastal heath, and dry or wet sclerophyll forests with thick ground-cover and understorey habitats (DSEWPaC, 2011a).	**Unlikely**. Marginal habitat onsite and no records from within 10 or 20 km.	E
Pseudomys novaehollandiae	New Holland mouse	V	This species inhabits open heath lands, open woodlands with a heathland understorey and vegetated sand dunes. It has a communal burrowing system and feeds on insects, leaves, flowers and fungi. It is a social animal, living predominantly in burrows shared with other individuals. Soil type may be an important indicator of suitability of habitat for the New Holland Mouse, with deeper top soils and softer substrates being preferred for digging burrows. In Victoria, the species has been recorded on deep siliceous podsols, sandy clay, loamy sands, sand dunes and coastal dunes.	**Unlikely**. No suitable habitat exists for this species within the Project area and no Wildnet records occur within 10 or 20 km.	E

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
			The species peaks in abundance during early to mid-stages of vegetation succession typically induced by fire (DCCEEW, 2025).		
Pteropus poliocephalus	grey-headed flying fox	V	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 (DCCEEW, 2025).	**Confirmed**. Observed foraging at two locations within the site during spring 2021 when food species in flower. Most flying fox camps occur closer to the coast. No camps known from within 20 km, with closest camp in The Palms National Park, Cooyar, approximately 39 km to the south-east.	E, W, survey results
Rostratula australis	Australian painted snipe	E	Shallow inland wetlands, brackish or freshwater that are permanently or temporarily inundated.	**Unlikely**. No suitable wetland habitat and no records within 10 or 20 km.	E
Stagonopleura guttata	diamond firetail	V	Endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. Found in grassy eucalypt woodlands, including box-gum woodlands and snow gum *Eucalyptus pauciflora* woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities (DCCEEW, 2025).	**Possible**. Suitable habitat is present, but species not detected during surveys and no Wildnet records within 10 or 20 km.	E
Turnix melanogaster	black-breasted button-quail	V	Occur in forested areas where deep leaf litter layer exists in a wide variety of forest types. Fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding (DCCEEW, 2025).	**Possible**. Marginal habitat exists in RE 11.8.3 in the south-western corner. No Wildnet records within 10 km. Numerous recent records within 20 km from Bunya Mountains which contains very different habitat. No detections during dam surveys, bird surveys, 24 months of BUS and opportunistic sightings.	E, W
Fauna					
Acacia grandifolia	-	V	Grows on hilly terrain of varying aspects and slope, on hillcrests, in gullies on plains. Species form open stands on sand, among large sandstone boulders and has been found on stony soils which are basalt derived.	**Unlikely**. Marginal habitat in Project Site and no records within 10 km. One Wildnet record within 20 km. Southern end of distribution near Wilkesdale about 20 m north of the Project Site.	E, W
Arthraxon hispidus	hairy-joint grass	V	Spreading grass often growing near creeks or swamps, generally in or on the edges of rainforest and wet eucalypt forest.	**Unlikely**. Marginal habitat and no records within 20 km.	E
Bothriochloa bunyensis	satin top grass	V	Endemic to South East Queensland and occurs on relatively fertile krasnozem (dark brown) soils derived from basalt on upper slopes and hill crests at altitudes of 600–1,100 m. Occurs in grassland or woodland with a grassy understorey.	**Unlikely**. No suitable habitat and no records within 10 km. Nearest records are about 20 km south of site in very different montane habitat in the Bunya Mountains.	E, W
Cadellia pentastylis	ooline	V	Semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain of various geology, including sandstone, conglomerate and claystone.	**Unlikely**. Marginal habitat (only 0.63 ha of vine thicket) within the Project Site and no records within 20 km. Not found during surveys of suitable habitat.	E
Clematis fawcettii	stream clematis	V	Prefers canopy gaps on loam soils derived from basalt and mixed volcanic rocks usually near streams. Occurs in association with dry rainforest, subtropical rainforest, eucalypt forests with scattered vine forest species.	**Unlikely**. Limited marginal habitat in Project Site and no records within 10 km. Nearest records are about 20 km south of site in very different montane habitat in the Bunya Mountains. Not found during surveys of suitable habitat.	E, W
Coleus omissus (listed as *Plectranthus omissus*)	-	E	Known from only four sites between Gympie and Gayndah. Grows on steep rock outcrops in eucalypt open forest and adjacent to vine forests at approximately 300-400 m above sea level (DEWHA, 2008b)	**Unlikely**. Marginal habitat present but no Wildnet records within 10 or 20 km of Project Site. Edge of species distribution is to the east of the Project Site.	E
Cossinia australiana	cossinia	E	Occurs on fertile soils from Rockhampton to Kingaroy. Associated with patches of Araucarian vine forest or vine thickets.	**Unlikely**. Limited marginal habitat in Project Site. No Wildnet records within 10 km and one record within 20 km. Not found during surveys of suitable habitat.	E, W
Denhamia parvifolia	small-leaved denhamia	V	Grows on soils derived from various geological substrates and is associated with semi-evergreen vine thickets and *Acacia harpophylla* (brigalow) scrub communities.	**Unlikely**.	E, W

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
				Limited marginal habitat in Project Site. No records within 10 km but 12 records within 20 km. Not found during surveys of suitable habitat.	
Dichanthium setosum	bluegrass	V	Occurs on heavy basaltic black soils and red-brown loams with clay subsoil in grasslands and open woodlands.	**Unlikely**. No suitable habitat and no records within 10 or 20 km.	E
Eucalyptus taurina	Helidon ironbark	E	Occurs on sandy soils in open woodlands at three separate sites in Queensland (Helidon, Crows Nest, and Mundubbera). Known to occur in Lockyer National Park to the east of Toowoomba (DCCEEW, 2024a). Recorded as occurring in regional ecosystems mapped as 11.7.6, 11.9.2, 11.10.1, 11.10.4, 12.9-10.2, 12.9-10.5, 12.9-10.14, 12.5.1, 12.12.2, 12.12.12, and 12.12.23 (DCCEEW, 2024a).	**Unlikely**. Marginal habitat in small areas of 11.7.6, which occurs in a mosaic of RE 11.12.3/11.7.6 on the Project Site. No Wildnet records within 10 or 20 km but the Project Site is between two known populations Mundubbera and Crows Nest. No detections within areas of suitable habitat on-site.	E
Haloragis exalata subsp. *velutina*	tall velvet sea berry	V	Found in rainforest and rainforest margins and adjacent grassland and open grassy woodland and often occurs in damp places near watercourses and in woodland on steep rocky slopes.	**Unlikely**. Limited marginal habitat on the Project Site. No records within 10 km and four records within 20 km. Not found during surveys of suitable habitat.	E, W
Homopholis belsonii	Belson's panic	V	Occurs in dry woodland habitats on a range of soil types; or on rocky hills supporting white box (*Eucalyptus albens*) and in wilga (*Geijera parviflora*) woodland; flat to gently undulating alluvial areas supporting belah (*Casuarina cristata*) forest; and soils and plant communities of poplar box (*Eucalyptus populnea*) woodlands; or flat to gently undulating alluvial areas supporting *Casuarina cristata* (belah) forest and sometimes *Acacia harpophylla* (brigalow) or *G. parviflora* (wilga) and subject to intermittent inundation. Also, drainage lines supporting *C. cristata* intermixed with sandy country dominated by cypress pine-bloodwood-ironbark-she-oak forest (DETSI, 2025). Generally found among fallen timber at the base of trees or shrubs, among branches and leaves of trees hanging to ground level or along the bottom of netting fences. It may also be associated with shadier areas of brigalow, myall, and weeping myall communities; in mountain coolibah communities; and on roadsides (DETSI, 2025).	**Unlikely**. Limited marginal habitat on the Project Site. No records within 10 km and one record within 20 km.	W
Lepidium peregrinum	wandering peppercress	E	This species has been found growing in riparian areas associated with open forests. It is commonly abundant in tussock grasslands fringing riparian areas. Species known distribution occurs from the Bunya Mountains, south-east Queensland, to near Tenterfield, in northern New South Wales (DCCEEW, 2024c).	**Possible**. Suitable habitat but no records within 10 km. Nearest record occurs about 20 km south of the Project Site in the Bunya Mountains. Multiple ALA records. Not found during surveys of suitable habitat within the impact area, but possible to occur in unsurveyed areas of the Project Site.	E, W
Leuzea australis (l*isted as Rhaponticum australe*)	Austral cornflower, native thistle	V	Grows in eucalypt open forest with grassy understory on roadsides and on road reserves with *Chloris gayana*, *Cirsium vulgare*, *Eucalyptus tereticornis* and *Angophora floribunda* on black clay soil (DCCEEW, 2025).	**Unlikely**. Limited habitat in the Project Site. No Wildnet records within 10 km and one record within 20 km. Possible on heavy clay soils that occur only in the south-western edge of the site, unlikely elsewhere. Not found during surveys of suitable habitat. No suitable habitat within planning corridor.	E, W
Macadamia integrifolia	macadamia nut	V	Prefers rainforest margins in remnant rainforest, on high nutrient soils with rock fragments. Occurs on a wide variety of well drained landforms and slopes.	**Unlikely**. Limited marginal habitat in the Project Site and no records within 10 or 20 km.	E
Phebalium distans	Mt Berryman phebalium	E	Found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type.	**Unlikely**. Limited marginal habitat. No records within 10 km and three records within 20 km. Not found during surveys of suitable habitat.	E, W
Picris evae	hawkweed	V	Occurs from Inverell region in NSW to Darling Downs and Moreton regions in south-east Queensland. It grows in eucalypt open woodland with a grassy understorey. Often found along roadsides and in cultivated areas on black, dark grey or red-brown soils, reddish clay-loam or medium clay soils (DEWHA, 2008a).	**Unlikely**. Marginal habitat present, and no Wildnet records within 10 km. The Project Site is 20 km north of the northern-most known specimen, in very different montane habitat in the Bunya Mountains. Not detected during active searches in woodland habitats.	E
Polianthion minutiflorum	-	V	Forest and woodland on sandstone slopes and gullies with skeletal soil, or deeper soils adjacent to deeply weathered laterite (DEWHA, 2008c).	**Unlikely**. Marginal habitat present on Project Site, but no Wildnet records within 10 km. One record within 20 km from Diamondy State Forest. Not found during surveys of suitable habitat.	E, W

Scientific name	Common name	EPBC status	Habitat description/ regional ecosystems present	Likelihood of occurrence	Source
Sophora fraseri	brush sophora	V	Found in moist habitats, often in hilly terrain at altitudes between 60-660 m. Occurs in shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities.	**Unlikely**. Limited marginal habitat within the Project Site and no records within 20 km.	E
Thesium australe	Austral toadflax	V	Shrubland, grassland or woodland, usually on damp sites. Suitable vegetation types within the Project Site likely to be limited to woodlands and grasslands in seasonally wet riparian areas (DCCEEW, 2025).	**Possible**. Suitable riparian habitat within the Project Site, limited suitable habitat and host plants in impact area. Wildnet records beside Jarail Road about 1 km west of site. Species not found during surveys of suitable habitat in impact area, but possible to occur in unsurveyed areas of the Project Site.	E, W
Zieria obovata	-	V	Wet open eucalypt forest dominated by *Syncarpia glomulifera*, *Eucalyptus abergiana*, and *E. cloeziana*, and on steep rocky slopes among granite slabs and boulders.	**Unlikely**. Limited marginal habitat in the Project Site and no Wildnet records within 10 km. One Wildnet record within 20 km.	W

Table 3-7 Protected matters addressed in the PER likelihood of occurrence assessment

Common name	Scientific name	EPBC status	Likelihood of occurrence outcome
Listed threatened species and ecological communities (s18 and s18A)			
Fauna			
black-breasted button-quail	*Turnix melanogaster*	V	possible
central greater glider	*Petauroides armillatus* (syn. Petauroides volans southern and central)	E	confirmed
Corben's long-eared bat, south-eastern long-eared bat	*Nyctophilus corbeni*	V	unlikely
diamond firetail	*Stagonopleura guttata*	V	possible
glossy black-cockatoo	*Calyptorhynchus lathami lathami*	V	confirmed
grey-headed flying fox	*Pteropus poliocephalus*	V	confirmed
koala	*Phascolarctos cinereus*	E	confirmed
New Holland mouse	*Pseudomys novaehollandiae*	V	unlikely
red goshawk	*Erythrotriorchis radiatus*	E	unlikely
regent honeyeater	*Anthochaera phrygia*	CE	possible
squatter pigeon	*Geophaps scripta scripta*	V	possible
white-throated needletail	*Hirundapus caudacutus*	V, Mi	confirmed
yakka skink	*Egernia rugosa*	V	possible
yellow-bellied glider	*Petaurus australis australis*	V	possible
Flora			
Austral toadflax	*Thesium australe*	V	possible
-	*Coleus omissus* (syn. *Plectranthus omissus*)	E	unlikely
hawkweed	*Picris evae*	V	unlikely
Helidon ironbark	*Eucalyptus taurina*	E	unlikely
-	*Polianthion minutiflorum*	V	unlikely
wandering peppercress	*Lepidium peregrinum*	E	possible
Listed migratory species (s20 and s20A)			
white-throated needletail	*Hirundapus caudacutus*	V, Mi	confirmed
fork-tailed swift	*Apus pacificus*	Mi	confirmed
oriental cuckoo	*Cuculus optatus*	Mi	possible
Additional species			
Australasian bittern	*Botaurus poiciloptilus*	E	possible
glossy ibis	*Plegadis falcinellus*	Mi	possible

Detailed habitat assessments for fauna species confirmed within the Project Site are presented in Section 3.3, with the exception of koala, greater glider and white-throated needletail which are addressed in Section 3.4. An assessment is included for Austral toadflax (Section 3.3.5), which is considered possible to occur, as there is suitable habitat for this species and records within 1 km of the

Project Site. Wandering peppercress and yellow-bellied glider were identified as possible to occur within the Project Site in the MNES assessment (Ecosure, 2025d) (refer Appendix E). Suitable habitat for wandering peppercress is present and there are multiple records 20 km to the south of the Project Site. Limited suitable habitat for yellow-bellied glider is present and there are records within 20 km west of the Project Site. A precautionary approach has been adopted and the likelihood of wandering peppercress and yellow-bellied glider species occurring has been assessed as possible. Habitat assessments for all other species considered possible to occur are presented in Table 3-9.

Species considered unlikely to occur based on lack of suitable habitat and lack of species records within the Project Site are addressed in the likelihood of occurrence assessment (refer Table 3-7).

3.3.1 Guidelines and assessment definitions

The following definitions are taken from the EPBC glossary of terms (DCCEEW, 2023d), and are used to describe potential habitat for fauna species listed under the EPBC Act, unless alternative species specific definitions are available:

- foraging habitat – the habitat where a species finds food
- breeding habitat – the habitat that a species uses during its breeding cycle
- dispersal habitat – the habitat that a species uses to travel through and rest in
- roosting habitat – a place where winged animals like birds or bats rest or sleep (may be the same as nesting habitat).

The specific habitat type requirements of each species confirmed, considered likely or possible to occur are presented in the habitat assessment for each. As outlined in Section 3.2.2.2, specific definitions of the types of habitat available for koala and greater glider respectively have been determined in recent literature and these have been adopted for the purposes of this assessment. These are considered further in Section 3.4.1 and Section 3.4.2.

Habitat requirements (foraging, breeding, dispersal, or roosting) differ depending on the diet, ecology, and life history of each species. For some species, there may be a clear distinction between the habitat types (e.g. south-eastern glossy black-cockatoos forage on the seed cones of she-oak [*Allocasuarina* or *Casuarina* trees], nest in eucalypt hollows with specific characteristics, and may disperse or roost in a range of forest or woodland habitats). For other species, the habitat types for each primary use may be the same (e.g. fork-tailed swifts both disperse and forage aerially).

Potential habitat for flora species is defined by the abiotic and biotic factors commonly associated with its occurrence.

The ecology, known threats, and habitat requirements of species known or considered likely to occur within the Tarong West Wind Farm Project Site are informed by Commonwealth guidance documents (such as conservation advice, recovery plans, or SPRAT profiles), state guidance documents, and published literature. For species which are vulnerable or endangered, habitat critical to the survival of a species or community is considered as part of the impact assessment. The MNES Significant Impact Guidelines (DoE, 2013b) defines habitat critical to the survival of a species as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

For the koala, greater glider, glossy black-cockatoo, grey-headed flying-fox and yellow-bellied glider, specific guidance is presented in their respective conservation advice, recovery plan documents and relevant technical advice which details the characteristics of general and critical habitat for these species.

As required by Section 5.2 of the PER Guidelines, koala, greater glider and white-throated needletail are addressed separately in Section 3.4 to allow consideration of specific additional matters.

3.3.2 Grey-headed flying-fox habitat

3.3.2.1 Ecology and habitat requirements

The grey-headed flying-fox is listed as vulnerable under the EPBC Act and is distributed from Ingham in Queensland to Adelaide in South Australia (DAWE, 2021a). Grey-headed flying-foxes are highly reliant on the blossom and fruit of native flowering species, and forage in flowering rainforest trees, eucalypts, paperbarks and banksias within 50 km of roosts (also known as camps) (DCCEEW, 2023f) The species occurs in a variety of habitats, but prefers sub-tropical and temperate rainforest, tall open forest, swamps, heaths and urban areas. Roosting sites (camps) are usually found in dense forest adjacent to waterbodies (DCCEEW, 2023f). It is highly nomadic and disperses in response to food availability, which is patchy and depends on the flowering patterns of food species (DCCEEW, 2023f), so seasonal and yearly fluctuations in camp sizes occur (DAWE, 2021a).

Birthing occurs at camps from October to February, and the reproductive cycle of the species is sensitive to environmental stresses such as food shortage (DCCEEW, 2023e). The most recent accepted population estimates are based on the National Flying-Fox Monitoring Program (DCCEEW, 2025), and place the national population at approximately 680,000 (±158,500) individuals, including correcting for camps which were not counted.

The nearest grey-headed flying-fox camp is in the Mt Wooloorin Reserve, almost 25 km from the most north eastern portion of the site. This is not identified as a Nationally Important flying-fox camp on the National Flying-fox Monitoring viewer (DCCEEW, 2025). The latest available data for this camp from the National Flying-fox monitoring program is from February 2021 and shows that the camp is a Category 2 camp, occupied by between 500 and 2,499 grey-headed and black flying-fox. The previous camp data shows that grey-headed flying fox has not been detected in any previous surveys at the camp since monitoring commenced in 2012. The nearest flying-fox camp to the Tarong West Wind Farm which has consistory recorded grey-headed flying-fox is near Cooyar (38 km south-east of the Project Site). This is also not a nationally important camp but numbers did peak in November 2018 at 10,000-16,000 individuals(DCCEEW, 2022c). Since then the camp has been surveyed six times and was estimated to contain 500 – 2,500 bats or less at each count (DCCEEW, 2022c).

3.3.2.2 Habitat critical to the survival of the species

The National recovery plan for the grey-headed flying-fox (DAWE, 2021a) considers habitat critical to the survival of the species to include:

- Areas containing important winter and spring flowering vegetation (including *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata, E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia or Syncarpia glomulifera*).

Additionally, areas that don't contain those species but are:

- Areas which contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation, and conception (August to May).
- Areas which contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the national flying-fox monitoring viewer (DCCEEW, 2024h).
- Areas which contain native and / or exotic species used for roosting at the site of a nationally important grey-headed flying-fox camp as identified on the national flying-fox monitoring viewer (DCCEEW, 2024h).

3.3.2.3 Known threats

Grey-headed flying-foxes are known to be impacted by several threatening processes including the following (DAWE, 2021a; DCCEEW, 2023e):

- loss of foraging habitat, particularly foraging habitat which flowers in winter
- loss of roosting habitat
- disturbance of camps by human activities, particularly in urban areas

- mortality from commercial fruit crop management (i.e. shooting to protect crops)
- mortality from heat stress during extreme heat events
- entanglement in netting and barbed wire fencing
- climate change affecting food availability and extreme heat events
- bushfires causing loss of roosting or foraging habitat
- electrocution on powerlines
- potential competition and hybridisation with black flying-foxes.

3.3.2.4 Observed habitat use

Grey-headed flying-foxes were detected foraging in the Project Site canopy during the spring 2021 surveys. A total of approximately 12 individuals were seen or heard during nocturnal spotlighting surveys over 3 separate nights. Seasonal preconstruction surveys conducted during 2022 and 2023 did not occur during mass flowering or fruiting events and so the species was unlikely to be sighted during these times. No sightings were made of grey-headed flying-foxes in flight, and so site-specific flight heights are not known.

No grey-headed flying-fox roosts were identified while traversing the site during field surveys between 2018 to 2023. It is unlikely that the Project Site is utilised for roosting and is likely to be used only for foraging when feed tree species are in flower or fruit. The Project Site is unlikely to provide consistent seasonal flowering for feed tree species.

3.3.2.5 Project Site habitat mapping

Foraging habitat: The species generally forages within 15 km of their day roost site (Tidemann, 1998) and Westcott et al (2015) reported in the National recovery plan for the species (DAWE, 2021a), that the mean distance that individuals travel from the camp in which the animal had roosted and to which it returns was 10.9 km. The Project Site lies 25 km from the nearest known camp used by grey-headed flying-fox however, as the species is known to travel further distances from camps to forage, the Project Site may be utilised for foraging when feed species are in flower or fruit. Areas critical to the survival of the grey-headed flying-fox were considered foraging resources within remnant and high-value regrowth habitat (thereby providing a mature mix of *Eucalypt* and *Corymbia* species), and non-remnant areas with canopy species (including *Eucalyptus, Corymbia, Grevillea, Melaleuca,* and *Syncarpia species*) which may provide occasional seasonal flowering (noting consistent annual seasonal flowering has not been observed on the Project Site) (Tromp-van Meerveld & McDonnel, 2006).

Foraging habitat available on the Project Site is presented in Table 3-8.

Table 3-8 Grey-headed flying-fox available habitat within the Project Site

Sub-type	Description	Available in the Project Site	Area of available habitat in the Project Site (ha)
Potential foraging	Includes important winter and spring flowering vegetation (including *Eucalyptus tereticornis, E. crebra, E. fibrosa, Corymbia citriodora citriodora*, among other species of *Eucalyptus, Corymbia*, *Castanospermum, Grevillea, Melaleuca*, and *Syncarpia*). This includes all suitable ground-truthed remnant and regrowth vegetation and higher quality non remnant woodland habitat.	Yes, however, reliable seasonal flowering has not been recorded on the Project Site and no mass flowering events observed during seasonal surveys (2018 – 2025).	5,270.43
Potential foraging – lower quality	Includes important winter and spring flowering vegetation (including *Eucalyptus tereticornis, E. crebra, E. fibrosa, Corymbia citriodora citriodora*,	Yes, Project Site contains *Eucalypt* species to provide	4,321.01

Sub-type	Description	Available in the Project Site	Area of available habitat in the Project Site (ha)
	among other species of *Eucalyptus, Corymbia*, *Castanospermum, Grevillea, Melaleuca*, and *Syncarpia*), in in open non remnant woodlands with sparse vegetation cover, noting seasonal mass flowering does not occur and is less likely to be able to consistently support foraging in these areas.	some limited availability of foraging	

Dispersal habitat: The species moves over longer distances to access seasonal abundances in food supply. This is reflected in migration on an irregular basis (Eby 1991). Any air space or forested areas traversed between seasonal foraging and roosting sites can be considered dispersal habitat.

Breeding and roosting habitat: Grey-headed flying foxes roost in trees, usually located in dense forest adjacent to waterbodies (e.g. rainforest, paperbark forest, riparian vegetation), but can also be located in urban areas (DCCEEW, 2023e). Camps are rest areas during the day while flying-foxes are not foraging, and breeding occurs seasonally within the camp.

Prior correspondence with DCCEEW has indicated grey-headed flying-foxes are known to forage within habitats similar to the koala (i.e. eucalypt dominated communities). All potential grey-headed flying-fox foraging habitat was modelled as the ground-truthed extent of remnant and HVR vegetation with eucalypt and vine thicket species containing foraging resources, and non-remnant areas modelled as General habitat and General (low quality) habitat for the koala, where there is sufficient density of mature trees to provide food resources for grey-headed flying-fox, as per Section 3.3.2. The foraging habitat was then refined based on the definition presented in Table 3-8.

The Project Site contains a total of 9,591.44 ha of potential foraging habitat for the grey-headed flying-fox, including 5,270.43 ha of potential foraging vegetation and 4,321.01 ha of low quality potential foraging vegetation. Potential habitat for grey-headed flying-fox within the Project Site is presented in Part A2 Figure 3-9.

3.3.3 South-eastern glossy black-cockatoo

3.3.3.1 Ecology and habitat requirements

South-eastern glossy black-cockatoos are listed as vulnerable under the EPBC Act and have a widespread distribution across Queensland and New South Wales. This species usually occurs in woodlands and it has been suggested they are seasonal migrants in SEQ, moving in response to seasonal availability of food resources and during breeding seasons (DCCEEW, 2022a).

South-eastern glossy black-cockatoos feed almost exclusively on the seeds of she-oaks, extracting the seeds from closed cones and leaving characteristic feeding litter (orts) under feeding trees (Morcombe, 2004). Preferred feed tree species vary by region and season. The species also displays preference for individual feed trees and cones, despite the presence of suitable trees of the same species nearby (DCCEEW, 2022a). The south-eastern glossy black-cockatoo can spend up to 88% if its day foraging and feeding (Morcombe, 2004). They utilise large hollows in living and dead trees and usually occur in pairs or groups of three (Morcombe, 2004). Little is known about the flight heights or behaviours of the south-eastern glossy black-cockatoo, but the Kangaroo Island subspecies (*Calyptorhynchus lathami halmaturinus*) is capable of flying up to 30 km a day between nests and feeding areas (Mooney and Pedler, 2005).

The characteristics of nesting hollows required for breeding are highly specific. South-eastern glossy black-cockatoos require large old tree hollows, positioned greater than 8 m above the ground in eucalypt species (usually at 10 – 20 m), in branches/stems greater than 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). This species nests close to, or

within, foraging habitat (DCCEEW, 2022a) and the same nest may be used in successive seasons, often nesting in close proximity to other breeding pairs (Garnett et al. 1999).

Habitat mapping was completed in 2016 by Healthy Land and Water (SEQ Catchments, 2016) which included habitat which was known or which had a high degree of confidence of being habitat. This mapping informed the essential habitat layers enacted under the VM Act. No essential habitat for south-eastern glossy black-cockatoo is mapped within the Project Site.

3.3.3.2 Habitat critical to the survival of the species

The *Calyptorhynchus lathami lathami* (south-eastern glossy-black cockatoo) Conservation Advice (DCCEEW, 2022a) identifies the following as habitat critical to the survival of this species:

- Areas for activities such as foraging, breeding, roosting, or dispersal – in SEQ preferred foraging habitats are those containing black she-oak (*Allocasuarina littoralis*) and forest she-oak (*A. torulosa*). Habitats providing the very specific nesting hollows required are also essential for this species.
- Areas for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators).
- Areas to maintain genetic diversity and long-term evolutionary development.
- Areas for the reintroduction of populations or recovery of the species – this includes areas that are currently not suitable but are capable of supporting future populations (such as bushfire affected areas).

3.3.3.3 Known threats

The south-eastern glossy black-cockatoo faces pressure from a range of threatening processes, including (Glossy Black Conservancy, 2010):

- Habitat loss, degradation, and fragmentation resulting in loss of feeding and breeding habitat (the specialised foraging requirements of the subspecies, as well as their reliance on large, old trees with hollows for breeding, makes the subspecies susceptible to long-term effects from habitat clearing).
- Increased competition with other native species for fewer nesting hollows, reducing breeding success.
- Fragmentation of suitable habitat resulting in genetic isolation of populations and generating edge effects that allow the incursion of more generalist species which may compete with the south-eastern glossy black-cockatoo.
- Changes in fire regimes, as feeding habitat burnt too frequently or too infrequently may be of lower quality.
- Climate change (and its effects on temperature and rainfall patterns) is likely to affect breeding success and the availability of feeding resources.
- Grazing by stock and feral herbivores suppresses the recruitment of foraging tree species.
- Psittacine beak and feather disease may become a more significant threat in the future, if increased competition for nesting hollows increases disease transmission.

3.3.3.4 Observed habitat use

This species is not included in the Commonwealth survey guidelines for threatened birds and the Queensland government Targeted species survey guidelines (Hourigan, 2012) were used when developing a survey method for this species. The conservation advice for this species (DCCEEW 2022a) recommends surveys for occupancy at the appropriate times of the year to identify breeding sites and preferred foraging species. Thirteen seasonal survey periods were undertaken, completing 648.5 hours of survey for this species (outlined in Table 3-5). This included:

- Diurnal bird survey involving a land based transect search through areas characteristic of she-oak *Allocasuarina* and *Casuarina* trees, with presence of suitable water bodies for drinking and also large hollow bearing eucalypts, used by this species during their breeding season.
- Targeted search for foraging and nesting signs. Observers noted the colour of the chewed she-oak cone which can determine how recent/old the feeding activity was. Aural detections were captured including calling, with observers listening for signs of feeding e.g. the clicking sound of the bird's mandible can be heard and cones/branches falling to the ground (Hourigan 2012).
- Four autumn and two winter surveys were completed, using a combination of targeted searches and fixed point surveys, to coincide with peak breeding season which occurs from March to August in SEQ (Glossy Black Conservancy 2010).

The survey effort undertaken is considered to comply with the requirements of the guidelines and the conservation advice.

During all surveys, seven individuals were sighted on or adjacent to the Project Site and signs of south-eastern glossy black-cockatoo foraging activity (orts) were detected at 22 locations. Two individuals were observed circling a dam and perching in the canopy in the north of the Project Site in the spring 2021 surveys, and two further group sightings were made in spring 2022 (n = 2) and spring 2023 (n = 3) during fixed point count surveys. The group sightings in 2022 and 2023 were both made at control site NT6 (approximately 1 km west of the Project Site). During 2022, two individuals were heard flying above the canopy and during 2023 three individuals were observed flying just above the canopy at approximately 20 m height.

Information on the foraging and nesting behaviour of south-eastern glossy black-cockatoo in the wider region is limited. However, orts, feed trees, and potential nesting trees have also been recorded at a nearby site which borders the Project boundary (Lot 61 on BO188), and a pair of south-eastern glossy black-cockatoos were previously observed to the west of Jumma Road, just outside the Tarong West Wind Farm Project Site (Golder Associates, 2018). Records of south-eastern glossy black-cockatoo presence and signs of feeding activity have been made in the area from 2018 (Golder Associates, 2018) through to 2025, suggesting sustained use of the wider area by this species.

3.3.3.5 Project Site habitat mapping

Foraging and dispersal habitat: The glossy black cockatoo is highly dependent on *Allocasuarina* species for feeding (Higgins, Peter and Steele, 2001). It inhabits open forest and woodlands on the coastline as well as within the Great Dividing Range where stands of sheoak occur (especially *Allocasuarina littoralis* and *Allocasuarina torulosa*). Inland populations feed on a wide variety of sheoaks including drooping sheoak, *Allocasuarina diminuta*, *Allocasuarina gymnanthera* and belah (*Casuarina cristata*) (OEH, 2022). Suitable foraging habitat exists in small patches of *Allocasuarina torulosa*, *A. littoralis, A. luehmannii* and *Casuarina cunninghamiana* amongst the remnant and high-value regrowth forest and woodland communities across the Project Site. Non-remnant areas of the Project Site have a predominately cleared understorey to support grazing practices and available sheoak stands in non-remnant areas is limited.

Roosting habitat: South-eastern glossy black-cockatoos mostly roost in the canopy of live, leafy trees such as eucalypts (Higgins, Peter and Steele, 2001). Potential roosting habitat is present within the Project Site, although no known roosts have been recorded on the Project Site.

Breeding habitat: The species breeds in a hollow stump or limb of living or dead trees as well as holes in trunks of tall trees (Higgins, Peter and Steele, 2001). Large, old tree hollows are required, positioned 8 m (but generally 10 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). There are no known nesting locations within the Project Site.

Areas with the potential to contain nesting locations were mapped based on a suitable distance from known foraging (1 km buffer), water sources (200 m dam and 1.5 km from of a watercourse) (Mooney and Pedler 2005) and including trees known to be >8 m (based on lidar height data) (Cameron 2006, Glossy Black Conservancy 2010).

Potential south-eastern glossy black-cockatoo foraging habitat was modelled as the ground-truthed extent of remnant and HVR vegetation which is most likely to contain large hollows and/or contains an understory of *Allocasuarina* or *Casuarina* food trees. This includes all remnant and HVR eucalypt forest and riparian REs verified within the Project Site (including REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).

The Project Site contains a maximum of approximately 1631.71 ha of potential foraging habitat and 1,851.45 ha (containing 3,064 trees) of potential breeding (nesting) habitat for the south-eastern glossy black-cockatoo. Potential habitat for this species is identified in Part A2 Figure 3-10.

3.3.4 Fork-tailed swift

3.3.4.1 Ecology and habitat requirements

The fork-tailed swift is listed as migratory under the EPBC Act and is widespread within Australia, typically beginning to arrive in Australia in October and departing in April to breed in east Asia (DoE, 2015). The habitat requirements and flight behaviour of the fork-tailed swift are similar to the white-throated needletail. In Australia, fork-tailed swifts are believed to be exclusively aerial, flying at heights up to 1,000 m above the ground (DoE, 2015). Rare occurrences of roosting have been reported (among trees, on the ground, and on the netting of a tennis court), though it is believed that the species mainly roosts on the wing (Higgins, 1999).

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, 2023a). The *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act* (DoE, 2015) considers 1,000 individuals to be an internationally significant proportion of the population and 100 individuals to be a nationally significant proportion of the population.

3.3.4.2 Known threats

The fork-tailed swift is not known to have any significant threats in Australia, though habitat loss and feral animal predation may affect the species (DCCEEW, 2023a). Mortality due to collision with turbines has been recorded in Australian wind farms (Moloney, Lumsden and Smales, 2019), however at this time wind turbine collision is not recognised as a significant threat to the species (DCCEEW, 2023a).

3.3.4.3 Observed habitat use

In total across all field surveys, three fork-tailed swifts were sighted foraging aerially within the Project Site. Two fork-tailed swifts were recorded above eucalypt woodland / grassland during 2023 fixed point count surveys, and one was recorded above eucalypt woodland during fixed point count surveys in spring 2023. On both occasions, fork-tailed swifts were sighted foraging aerially in association with larger flocks of white-throated needletails, which the species is known to do (Higgins, 1999). No fork-tailed swifts were observed roosting in vegetation during nocturnal spotlighting surveys.

Individuals were observed foraging at heights of 60 – 100 m above the ground, passing quickly backwards and forwards through the air among the larger flock of white-throated needletails. Sightings were typically in association with stormy weather, which creates ideal conditions for uplift of insects for foraging (DCCEEW, 2023a).

3.3.4.4 Project Site habitat mapping

As the fork-tailed swift can occur in any airspace and was observed on two occasions foraging in the air, all aerial space above the Project Site (approximately 17,500 ha footprint) is considered foraging habitat for the fork-tailed swift. As the species roosts on the wing, the Project Site is unlikely to provide roosting habitat for the fork-tailed swift. No habitat is mapped for this species.

3.3.5 Austral toadflax

3.3.5.1 Ecology and habitat requirements

Austral toadflax is listed as vulnerable under the EPBC Act. The species is a small inconspicuous herb that is semi-parasitic on the roots of several grass species, including kangaroo grass (*Themeda triandra*) (DoE, 2013a). It has a sporadic distribution from Carnarvon National Park in central Queensland to Victoria (DoE, 2013a). The total population size is unknown, but could be between

100,000 to 1,000,000 individuals (DoE, 2013a). In Queensland, it grows in grassy heath, shrub land, grassland, or woodland, usually on damp sites (DESI, 2022).

3.3.5.2 Known threats

Austral toadflax is known to be threatened by changes to fire / disturbance regimes, livestock grazing, herbivory by native and introduced species, land clearing for development, invasive weeds, and development works in linear vegetation remnants, where the species is often restricted to (DoE, 2013a).

3.3.5.3 Occurrence in the Project Site

Surveys between 2018 and 2025 did not detect this species within the Project Site, but two records are located in HVR of RE 11.3.25 (fringing riparian woodland) adjacent to Jarail Road, about 1 km west of the Project Site, and suitable comparable habitat is present within the Project Site outside of the clearing footprint. Detailed surveys in 2025 assessed areas of suitable habitat for the species and determined the available habitat within the planning corridor was highly degraded due to existing land use practices (e.g. grazing) and did not contain any host plant species for Austral toadflax, as such these areas of mapped habitat are not in a suitable condition to support the species.

3.3.5.4 Habitat mapping

Potential habitat was modelled as riparian areas associated with mapped watercourses (including remnant and non-remnant vegetation) as follows:

- 100 m riparian corridor along stream order 3 and 4 watercourses
- 200 m riparian corridor along stream order 5 and 6 watercourses.

The Project Site contains approximately 993.01 ha of potential habitat for Austral toadflax. Potential habitat for Austral toadflax is identified in Part A2 Figure 3-11.

3.3.6 Wandering peppercress

3.3.6.1 Ecology and habitat requirements

Wandering peppercress is listed as endangered under the EPBC Act. The species is a perennial herb that occurs from the Bunya Mountains in SEQ to near Tenterfield in northern New South Wales (DoE, 2014a). The estimated extent of occurrence is approximately 50,000 km². The total area of occupancy was estimated to be less than 100 ha in 2014 (DoE, 2014a), but is likely to be larger, as (ALA, 2025) contains numerous records collected since this date. The total population size is unknown.

Most populations are known from riparian open forest and woodland (DoE, 2014a), and the species is commonly abundant in tussock grasslands fringing riparian areas (DoE, 2014a). The closest known records are approximately 20 km south of the Project Site in the Bunya Mountains (ALA, 2025). These records include a cleared creek terrace, the edge of montane rainforest at Dandabah and garden beds containing soil transported from the Dandabah rainforest site.

3.3.6.2 Known threats

Habitat clearing for agriculture, rabbit and livestock grazing, and weed invasion are recognised as potential threats to wandering peppercress (DoE, 2014a).

3.3.6.3 Occurrence in the Project Site

Surveys between 2018 and 2025 did not detect wandering peppercress within the Project Site, though potential habitat for the species in remnant and non-remnant riparian areas is present outside of the clearing footprint. Detailed surveys in 2025 assessed areas of suitable habitat for the species and determined the available habitat within the planning corridor was highly degraded due to existing land use practices (e.g. grazing) and was not in a suitable condition to support the species.

3.3.6.4 Habitat mapping

Potential habitat was modelled as riparian areas associated with mapped watercourses (including remnant and non-remnant vegetation) as follows:

- 100 m riparian corridor along stream order 3 and 4 watercourses
- 200 m riparian corridor along stream order 5 and 6 watercourses.

The Project Site contains approximately 993.01 ha of potential habitat for wandering peppercress. Potential habitat for wandering peppercress is identified in Part A2 Figure 3-12.

3.3.7 Yellow-bellied glider

3.3.7.1 Ecology and habitat requirements

Yellow-bellied glider is listed as vulnerable under the EPBC Act. The species occurs at altitudes ranging from sea level to 1,400 m above sea level and has a widespread but patchy distribution from SEQ to far south-eastern South Australia, near the South Australia to Victorian border (DAWE, 2022a). In Queensland distribution is mostly coastal, extending southward along the eastern seaboard from north of Mackay and continuing through the New South Wales to Queensland border.

The yellow-bellied glider inhabits tall mature eucalypt forests (either wet or dry) where it feeds on insects among the bark of trees and also on the sap of certain feed trees (DEWHA, 2010a; DAWE, 2022a). The species tends to occur in mature old growth forests and those with winter-flowering and smooth-barked eucalypts (DAWE, 2022a), where feeding and denning resources are numerous and diverse enough to support populations. The species is sensitive to fragmentation and dispersal of individuals is restricted by gliding distance (DAWE, 2022a).

The distribution is highly disjunct due to a combination of biogeographic processes and land clearing, as well as the specific habitat requirements, even in continuous sections of forest (Eyre 2004). The species generally occurs in small social groups that occupy large and exclusive home ranges, which they aggressively defend and often occur at low densities (0.03-0.14 individuals/ha). Yellow-bellied gliders show a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter (DAWE, 2022a). Their home ranges are large due to the dispersed nature of foraging trees and the seasonal changes in use (DAWE, 2022a). It is suggested by Goldingay and Possingham (1995) that minimum habitat areas of 180–350 km^2 are required to maintain a viable subpopulation with a figure of 320 km^2 suggested for SEQ (Eyre, 2002).

Habitat corridors are required to facilitate dispersal of yellow-bellied glider between fragmented habitat patches and/or to enable recolonization or movement away from threats (DAWE, 2022a). This species has very low dispersal capabilities which reinforces its dependence on contiguous areas of forest (DAWE, 2022a). State and regional corridors adjoin the Project Site and could provide fauna movement within these corridors between contiguous patches of habitat where the species are known to reside (Part A2 Figure 3-13). The yellow-bellied glider (south-eastern) requires large areas of forest to support large, exclusive home ranges, and has an inability to cross even small areas of cleared land (Kambouris et al. 2013; Woinarski et al. 2014). It may not persist in small, isolated forest fragments (Lindenmayer 1999, cited in Taylor & Rohweder 2020).

The yellow-bellied glider (south-eastern) dens in the hollows of large, typically smooth-barked eucalypts. Denning trees are usually live but the species can also den among dead hollow-bearing trees (DAWE, 2022a).

The Project Site does not provide breeding habitat or foraging habitat suitable to support this species. The habitat although contains some denning and suitable foraging trees, is marginal for this species and is likely to only support the species in a limited dispersal function.

3.3.7.2 Habitat critical to the survival of the species

The conservation advice states that habitat critical to the survival of the yellow-bellied glider (southeast-ern) is broadly defined as areas containing:

- Large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees.
- Areas identified as refuges under future climate change scenarios.
- Short or long-term post-fire refuges (i.e., unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.
- Habitat corridors required to facilitate dispersal of the subspecies between fragmented habitat patches and/or that enable recolonization or movement away from threats. Yellow-bellied gliders (south-eastern) have a glide ratio (horizontal distance/height dropped) of around 2.0, and corridors spanning gaps larger than the distance gliders are likely to be able to travel should be considered

critical to the survival. There is not enough evidence to define the canopy and width characteristics of appropriate corridors. In the absence of such information, a precautionary approach should be taken to maximise dispersal by considering all habitat corridors in the species' range to be habitat critical to the survival.

- Areas in which some trees have evidence of use for sap extraction by yellow-bellied glider (south-eastern).

Other attributes associated with a particular area can help evaluate its value and role in a species' life cycle, (e.g. frequency of use of that area or the area's ability to become habitat for the species, the area's ability to provide habitat during times of stress, or the area's ability and the cost-effectiveness of it to be managed for the species so that the species can be re-established in that area.

3.3.7.3 Known threats

The yellow-bellied glider (south-eastern) is impacted by several threatening processes (DAWE, 2022a):

- habitat clearing causing loss of feeding and denning trees
- habitat fragmentation restricting dispersal between patches of suitable habitat (the species has low dispersal ability through cleared areas and is restricted by gliding distance)
- changing fire regimes (increasing frequency and intensity of fires) causing direct mortality, loss of feeding trees, loss of suitable denning hollows, and exacerbating fragmentation
- timber harvesting removing hollow-bearing trees in particular
- changes in temperature and rainfall due to climate change causing loss of feeding trees, reduction in the extent of suitable habitat, alteration of sap flow in sap feeding trees or direct mortality due to heat stress
- predation by feral cats and European red foxes, most likely when yellow-bellied gliders are forced to traverse the ground (e.g. during bushfires)
- habitat degradation to sapling habitat trees from feral deer
- entanglement in barbed wire fencing.

3.3.7.4 Observed habitat use

There were no detections of yellow-bellied glider within the Project Site during field surveys and no WildNet records occur within 10 km but there are two records approximately 14 km west within the Diamondy State Forest which has an area of 14,200 ha. Other records within the region include Barakula State Forest (283,500 ha), Tarong State Forest (1,500 ha) and Squirrel Creek State Forest (8,655 ha) where there are large continuous patches of habitat.

A total of 1,396 person minutes (23.27 person hours) were spent spotlighting and conducting call playback for yellow-bellied glider over four days. In addition, no V-shaped feeding scars (which are characteristic of yellow-bellied gliders (Goldingay and Kavanagh 1991)) were detected on any suitable foraging trees. Locations of call playback, spotlighting transects and spotlighting via vehicle are provided in Part A2 Figures 3-3 to 3-8. No presence or signs of yellow-bellied glider were detected during the targeted 2025 surveys or during the targeted surveys previously conducted on the Project Site (Ecosure 2023).

High numbers of other glider species were detected on-site, indicating that suitable habitat features for gliders are present in the form of den sites and foraging species. The absence of sufficiently large contiguous patches of forest required by this species has limited the suitability of the site to marginal at best.

3.3.7.5 Project Site habitat mapping

Potential habitat for yellow-bellied glider is modelled as all remnant and high value regrowth vegetation and non-remnant woodland with suitable habitat attributes in proximity to remnant habitat and / or with substantial connectivity to provide dispersal.

Foraging habitat: Tall mature old growth eucalypt forests (either wet or dry) where it feeds on insects among the bark of trees and also on the sap of certain sap feed trees (DEWHA, 2010a; DAWE, 2022a).

There is no evidence of foraging on the Project Site, although suitable sap trees (e.g. *Corymbia citriodora and Eucalyptus tereticornis*) occur in some patches across the project stie.

Breeding habitat: The yellow-bellied glider (south-eastern) dens in the hollows of large, typically smooth-barked eucalypts, usually in live trees but will den among dead hollow-bearing trees (DAWE, 2022a). The Project Site does not contain mature old growth forest suitable to support a breeding subpopulation of the species.

Dispersal habitat: Habitat corridors to facilitate movement of yellow-bellied glider between fragmented habitat patches and/or to enable recolonization or movement away from threats (DAWE, 2022a). This species has very low dispersal capabilities which reinforces its dependence on contiguous areas of forest (DAWE, 2022a).

Marginal habitat exists within the Project Site due to the absence of large contiguous patches of mature old growth forest. There are several contiguous areas of mature old growth forest that contain historical records of yellow-bellied glider within the broader region between 15 to 80 km from the Project Site (e.g. Diamondy State Forest [14,200 ha], Barakula State Forest [283,500 ha], Benarkin State Forest [16,160 ha], Tarong State Forest [1,500 ha] and Squirrel Creek State Forest [8,655 ha]) (Part A2 Figure 3-13).

The current land management practices across the Project Site include maintaining cleared grazing areas and selective removal of timber resources from non-remnant areas by landowners. This land management is unlikely to change over the life of the project (minimum 30 years) and as such the Project Site is unlikely to support a future subpopulation or family groups of the subspecies or increase the suitability of the site as potential habitat. Based on these findings, and the fragmented nature of the Project Site compared to the large continuous patches of habitat where known records of yellow-bellied glider have previously been recorded in the region, there is a low likelihood of this species occurring within the impact area or Project Site.

Modelling of potential dispersal habitat is presented in Part A2 Figure 3-14. The Project Site contains approximately 9,841.58 ha of potential dispersal habitat for yellow-bellied glider.

3.3.8 Species possible to occur

The habitat requirements and availability within the Project Site for species considered possible to occur within the Project Site and not recorded during surveys are presented in Table 3-9.

Table 3-9 Species habitat requirements for flora and fauna considered possible to occur within the Project Site

Common name / Scientific name	EPBC status	Species habitat requirements	Potential habitat within Project Site	Species records	Likelihood
Birds					
regent honeyeater *Anthochaera phrygia*	CE	**Foraging habitat:** Commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, may inhabit riparian vegetation and lowland coastal forest. Mainly a canopy species, it is reliant on select species of eucalypt and mistletoe which provide rich nectar (Commonwealth of Australia, 2016). **Breeding habitat:** Typically breeds in the canopy of rough-barked trees (e.g. ironbarks, *Casuarina*, and *Angophora*) which may or may not be near food resources (Commonwealth of Australia, 2016, 2016; DoE, 2019). **Dispersal habitat:** The species may travel large distances, but the movement biology of the species is not well understood (DoE, 2019). Known to use roadside reserves, travelling stock routes and street trees in addition to remnant wooded areas (Commonwealth of Australia, 2016), dispersal habitat is likely to be any forested area with native tree species. **Roosting habitat:** Roosts in trees with dense foliage (DoE, 2019).	Potential regent honeyeater habitat includes the ground-truthed extent of eucalypt woodland remnant and HVR vegetation. The Project Site contains approximately 1,631.71 ha of potential dispersal, roosting, breeding and foraging habitat for regent honeyeater.	One ALA record (date unknown) approximately 13 km southeast of the Project Site within the Bunya Mountains, which contains rainforest habitat not present within the Tarong West Wind Farm Project Site. No detections during field surveys.	There is suitable habitat for regent honeyeater within the Project Site but no records within 20 km. There were no detections from 613.5 person hrs of targeted bird survey effort. It is possible that this species could occur within the Project Site.
Australasian bittern *Botaurus poiciloptilus*	E	**Foraging and roosting habitat:** This species forages and roosts in waterbodies containing vegetation and may utilise dams or other waterbodies within the Project Site. **Breeding habitat:** Nests are constructed in dense vegetation overhanging shallow water, adjacent to relatively deep, densely vegetated freshwater swamps and pools. Limited breeding habitat for this species is present on-site (DoEE, 2019).	Potential Australasian bittern habitat includes dams and other waterbodies containing vegetation. The Project Site contains very limited habitat for this species.	One WildNet record within 20 km but no records within 10 km. No detections during dam surveys, bird surveys, and opportunistic sightings.	There is suitable habitat for Australasian bittern within the Project Site but no records within 20 km. It is possible that this species could occur within the Project Site.

Common name / Scientific name	EPBC status	Species habitat requirements	Potential habitat within Project Site	Species records	Likelihood
		Dispersal habitat: The species is known to travel long distances between habitats as conditions change and could use the Site as a vagrant.			
oriental cuckoo *Cuculus optatus*	Mi	**Dispersing and roosting habitat:** Mainly inhabiting forests, the oriental cuckoo occurs in mixed, deciduous and coniferous forest. It is present at all levels of the forest canopy, and can be found at a range of elevations, occasionally being recorded in mountains as high up as 1,100 metres (Higgins, 1999). **Foraging habitat:** Feeds arboreally on insects on trunks and among the branches and foliage of trees or shrubs (DoE, 2015). **Breeding habitat:** The species does not breed in Australia (DoE, 2015).	Potential oriental cuckoo habitat includes the ground-truthed extent of remnant and HVR vegetation. The Project Site contains approximately 1,631.71 ha of potential dispersal, roosting and foraging habitat for oriental cuckoo.	Nearest record is from the Tarong locality approximately 35 km from site. No detections during field surveys.	There is suitable habitat for oriental cuckoo within the Project Site but no records within 20 km. It is possible that this species could occur within the Project Site.
squatter pigeon *Geophaps scripta scripta*	V	**Foraging and dispersal habitat:** The species occurs in a wide range of habitats wherever there is a grassy understorey. It is commonly encountered in grassy woodlands and open forests dominated by Eucalypts (DCCEEW, 2024b). The squatter pigeon (southern) forages in open woodland or scrub dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species (DCCEEW, 2024b). **Breeding habitat:** Nests in shallow depressions at ground level near or under vegetation (DCCEEW, 2024a), typically on stony rises with gravelly or sandy soils near to permanent water sources (DCCEEW, 2024b). Limited breeding habitats are available within the Project Site.	Suitable habitat for squatter pigeon exists across wide areas of the site where there are grassy understoreys, in remnant and regrowth vegetation. Potential habitat for this species includes remnant eucalypt forest and woodlands plus modelled non-remnant woodland within the site. The Project Site contains approximately 5,720.43 ha of potential habitat for squatter pigeon.	No records within 20 km of Project Site. Nearest record is approximately 64 km east of the Project Site. No detections during field surveys.	There is suitable habitat for squatter pigeon within the Project Site but no records within 20 km. It is possible that this species could occur within the Project Site.
glossy ibis *Plegadis falcinellus*	Mi	**Foraging habitat:** Fresh water marshes near the edges of lakes and rivers, lagoons, flood-plains,	Potential glossy ibis habitat includes dams and	No WildNet records within 10 km but three records within 20 km. No detections during	Limited suitable habitat exists within the Project Site. There are no WildNet records within 10 km,

Common name / Scientific name	EPBC status	Species habitat requirements	Potential habitat within Project Site	Species records	Likelihood
		swamps, reservoirs, sewage ponds and cultivated areas under irrigation. **Breeding habitat:** The species nests in large or small mixed species colonies and only at a limited number of locations in Australia. The species is unlikely to breed on the Project Site. **Dispersal habitat:** The species migrates within and outside Australia and the Project Site could form part of wider migration routes. **Roosting habitat:** Roosts are in trees, usually near waterbodies.	other waterbodies containing vegetation. The Project Site contains very limited habitat for this species.	dam surveys, bird surveys, and opportunistic sightings.	but numerous records within 20 km. It is possible that glossy ibis could occur within the Project Site.
diamond firetail *Stagonopleura guttata*	V	**Dispersal habitat:** Endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. Found in grassy woodlands and open forests, in areas with high density of grasses (DCCEEW, 2023b). **Foraging habitat:** Diamond firetails feed on insects, grass and herb seeds, and green leaves at ground level (DCCEEW, 2023b). **Breeding habitat:** Creates nests using grasses and feathers within prickly foliage or at the base of the stick-nests of larger birds (DCCEEW, 2023b).	Potential habitat for this species within the Project Site includes woodlands and open forests with grassy understoreys. Potential habitat for diamond firetail was modelled as all ground-truthed remnant/HVR woodland and open forest REs. The Project Site contains approximately 1,631.71 ha of potential habitat for diamond firetail.	Suitable habitat is present, but the species was not detected during extensive field surveys and no WildNet records exist within 20 km of the Project Site. Records present in the rainforest habitat of the Bunya Mountains, approximately 20 km to the south west.	Suitable habitat exists within the Project Site. There are no WildNet records within 20 km. It is possible that diamond firetail could occur within the Project Site.
black-breasted button-quail *Turnix melanogaster*	V	**Dispersal and roosting habitat:** Most commonly associated with closed-canopy vine thicket rainforests with high leaf litter cover (Threatened Species Scientific Committee, 2015). Also occurs in thicket or woodland habitats with dense understories, hoop pine plantations with dense understories, and in areas of lantana (*Lantana camara*) infestation (Threatened Species Scientific	Only one small patch of suitable vine thicket habitat (RE 11.8.3) for black-breasted button quail was detected during surveys, in the south-western corner of the Project Site. Targeted	Marginal habitat exists in RE 11.8.3 in the south-western corner of the Project Site. No WildNet records within 10 km of the Project boundary but 21 records within 20 km, at Archookoora State Forest to the east and the Bunya Mountains	Marginal habitat exists in RE 11.8.3 in the south-western corner of the Project Site. There are no records within 10 km of the Project Site but numerous records within 20 km where suitable habitats exist.

Common name / Scientific name	EPBC status	Species habitat requirements	Potential habitat within Project Site	Species records	Likelihood
		Committee, 2015). In coastal habitats, may also occur in sandy dune scrub (Threatened Species Scientific Committee, 2015). **Foraging habitat:** Feeds on insects and seeds at ground level, scratching among the leaf litter (DCCEEW, 2024n). **Breeding habitat:** Constructs ground nests typically concealed underneath foliage or among buttress roots of trees within broader suitable habitat types (DCCEEW, 2024n).	surveys did not detect this species or any signs (e.g. platelets). The Project Site contains approximately 0.63 ha of potential habitat for the species.	to the south. The Archookoora State Forest contains both remnant native vegetation (eucalypt woodlands) and plantation, and the Bunya Mountains contains rainforest habitat not present within the Tarong West Wind Farm Project Site. No detections during targeted field surveys.	It is possible that this species could occur within the Project Site.
Reptiles					
yakka skink *Egernia rugosa*	V	**Habitat:** The yakka skink is an omnivorous species which lives and breeds in colonial groups (DCCEEW, 2023c). Colonies have been found in large hollow logs, cavities or burrows under large fallen trees, tree stumps, logs, stick-raked piles, large rocks and rock piles, dense ground-covering vegetation, and deeply eroded gullies, tunnels and sinkholes. Known distribution extends from the coast to the hinterland of sub-humid to semi-arid Queensland. Core habitat is within the Mulga Lands and Brigalow Belt South Bioregions. Occurs in open dry sclerophyll forests (ironbark) or low woodland and open shrub land on RE land zones 3, 4, 5, 7, 8, 9, 10 and 12 (though land zone 8 not considered core habitat and land zone 12 in Wet Tropics bioregion only). Has also been recorded in lancewood forest on coarse gritty soils in the vicinity of low ranges, foothills and undulating terrain with good drainage.	Yakka skink occurs in open dry sclerophyll forests (ironbark) or low woodland and open shrub land. Potential habitat for this species includes remnant/HVR and modelled non-remnant woodland vegetation within the site. The Project Site contains approximately 5,720.43 ha of potential habitat for yakka skink, however there are specific den requirements which reduce the actual available area.	Some potential habitat onsite but not detected during active herpetofauna searches. No WildNet records within 20 km, and nearest record is more than 20 km south in the Bunya Mountains.	There is suitable habitat for yakka skink within the Project Site but no records within 20 km. It is possible that this species could occur within the Project Site.

3.4 Listed threatened species and listed migratory species habitat assessment

Section 5.2 of the PER guidelines outlined specific matters to be addressed in relation to koala, greater glider and white-throated needletail. This information is presented in habitat assessments for these species in the following sections.

3.4.1 Koala

3.4.1.1 Ecology and habitat requirements

The koala is listed as endangered under the EPBC Act. The species itself is distributed throughout eastern Australia in Queensland, New South Wales, Victoria, and parts of South Australia, however only the combined populations of Queensland, New South Wales and the Australian Capital Territory are listed under the EPBC Act (DAWE, 2022d). In general, the species occurs in eucalypt forest and woodland, where it is heavily reliant on feed tree species of the genus *Eucalyptus*, *Corymbia*, *Angophora*, or *Lophostemon*. The size of the listed Queensland, New South Wales and Australian Capital territory population is estimated to be between 95,000 and 280,000 individuals (DCCEEW, 2024i). The specific habitat requirements of local koala populations vary depending on the area, and a number of Commonwealth guidance documents are available which detail the habitat requirements for koala (Table 3-10).

Table 3-10 Koala habitat requirements from Commonwealth guidance documents

Guidance document	Koala habitat key characteristics
A review of koala habitat assessment criteria and methods (Youngentob, Marsh and Skewes, 2021)	The koala is predominantly associated with eucalypt forests containing locally preferred browse tree species. The features of browse tree quality that drive the foraging decisions and local population densities of koala include nutritional quality, leaf nitrogen and plant secondary metabolites such as tannins. Non-eucalypt trees, even when not favoured for food, may be used for shelter and thermoregulation. Additionally, there is no support for a distinction between “breeding” and “non-breeding” habitat for koala. Locally important tree species for browsing and ancillary use are identified. Locally important koala trees are defined as trees from a species that is regularly browsed by koalas in a particular koala management bioregions, such that it could be considered a substantial portion of the koala’s diet. Connectivity between habitat patches does not require a continuity of vegetation, as koalas can move large distances on the ground. The ground itself forms an essential component of koala habitat (Youngentob, Marsh and Skewes, 2021). Both remnant and non-remnant vegetation can be high quality koala habitat, and koalas are just as likely to occur in “lower quality” regrowth habitats as they were in “higher quality” habitats. Tree species diversity is also not a prerequisite to koala occupation which relies more on the nutritional quality of the trees present.
Conservation advice for *Phascolarctos cinereus* (koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022c)	Koala habitat typically includes forests and woodlands dominated by *Eucalyptus* species. Primary food tree species differ across regions and habitats depending on the chemical profiles and water content of different food tree leaves. Biophysical habitat attributes for the koala include places that contain the resources necessary for individual foraging, survival (including predator avoidance), growth, reproduction and movement. Habitat areas with resources for koala include: • forests or woodlands • roadside and rail vegetation and paddock trees • safe intervening ground matrix for travelling between trees and patches to forage, shelter and reproduce • access to vegetated corridors or paddock trees to facilitate movement between patches.

National recovery plan for the koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE, 2022d)	Koala habitat is defined by the availability and nutritional quality of food trees, presence of suitable resting trees and microclimates, age structure of vegetation, history, and impediments to dispersal. These differ regionally because they are strongly influenced by local climatic and landform attributes. Feed tree species vary locally, but koala browse predominantly on the leaves of *Eucalyptus*, *Corymbia*, and *Lophostemon* species. Non-food tree species also vary locally and are used for shelter, thermoregulation, and predator avoidance. Factors influencing the quality of koala habitat include: presence and density of preferred food tree species food tree nutritional quality shelter trees and vegetation structure hostility of the open ground matrix between habitat patches.
Identifying habitat for the endangered koala (DCCEEW, 2024e)	Habitat includes land that has attributes that support koala (such as presence of feed trees, connectivity to other habitat, located near to areas with koala populations). Koala habitat will often include: • forests or woodlands, especially with a higher proportion of feed tree species, and may include remnant or non-remnant vegetation • roadside and railway vegetation and paddock trees • safe intervening ground for travelling between trees and patches to forage, shelter and reproduce • access to vegetated corridors or paddock trees to facilitate movement between patches. Climate refugia such as drainage lines, riparian zones and patches can also be important attributes as they contribute to a location's resilience to drying conditions and are likely to provide a cooler refuge during periods of bushfire and heatwaves.
Guidelines for the content of a draft public environment report – Tarong West Wind Farm (EPBC 2023/09643)	Any forest or woodland (including remnant and regrowth, and modified vegetation communities) containing species that are koala food trees or any grassland with emergent koala food trees. This definition includes mixed eucalypt regrowth.

3.4.1.2 Habitat critical to the survival of the species

Habitat critical to the survival of the koala is not explicitly defined in the koala conservation advice (DAWE, 2022c, 2022d), however the following factors should be considered when identifying habitat critical to the survival of the species:

- whether the habitat is used during periods of stress (e.g. flood, drought, or fire)
- whether the habitat is used to meet essential life cycle requirements (e.g. foraging, breeding, or social behaviour patterns)
- the extent to which the habitat is used by important populations
- whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development
- whether the habitat is necessary for use as corridors to allow the species to move freely between sites to meet essential life cycle requirements
- whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation
- any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community.

The regional differences in koala habitat and nutritional requirements, and the varying importance of non-remnant habitat features (e.g. roadside vegetation, paddock trees) depending on landscape

context means that habitat critical to the survival of the species will be location-dependent (DAWE, 2022c). Nonetheless, the national recovery plan for the species advises that the following should be avoided to avoid impacts to koala:

- clearing of habitat used by koalas for feeding and resting
- reducing connectivity between patches of habitat used by koalas for feeding, resting, commuting and dispersing (either by clearing of vegetation or by the erection of barriers to passage)
- clearing of habitat used by koalas during extreme events (heat waves, drought, and fire)
- avoiding activities that will expose koalas to additional threats (e.g. dogs, cars) in places where koalas must use the ground to move between resting and feeding trees.

3.4.1.3 Known threats

The koala is impacted by several threatening processes (DAWE 2022b), including:

- contraction of climatically suitable habitat southwards and eastwards as a result of the drier and warmer conditions caused by climate change
- increasing intensity and frequency of drought, heatwaves, and bushfires caused by climate change
- potential declining nutritional value of foliage caused by increased atmospheric carbon dioxide, bushfire causing regrowth, or altered tree species composition as a result of clearing or fire
- clearing, fragmentation, and degradation of koala habitat for human uses such as agriculture, grazing, and urbanization
- mortality from vehicle strike and dog attacks, particularly during the breeding season when movement and dispersal increases
- diseases such as koala retrovirus (KoRV) and Chlamydia causing declining health, infertility, blindness, and death.

3.4.1.4 Observed habitat use

Field surveys recorded 13 koala sightings within the Project Site and three sightings in areas adjacent to the Project Site. Additional signs of koala use (koala scats and scratches) were observed within and adjacent to the Project Site. Koala sightings and signs were predominantly in remnant vegetation containing *Eucalyptus tereticornis* (Queensland blue gum) in RE 11.3.25 and *Eucalyptus crebra* (narrow-leaved ironbark) in REs 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6. These observations are concordant with what is known of koala tree species usage in the Brigalow Belt, with *E. tereticornis* and *E. crebra* both being LIKT in the region (Youngentob, Marsh and Skewes, 2021). koala and koala use observation locations are identified on Part A2 Figure 3-15.

3.4.1.5 Project Site habitat mapping

Most REs within the Project Site contain food trees that koalas are known to use, and the koala population is likely to be widespread throughout the site. Table 3-9 lists tree species recorded during site surveys that are known to be used by koalas in the Brigalow Belt bioregion (Youngentob, Marsh and Skewes, 2021), SBRC region (Mitchell, 2015) and SEQ (QPWS, 2002); and/or species identified as koala food trees in Queensland essential habitat mapping (DoR, 2022a).

The 2022 review of koala habitat identified LIKT (species that are regularly browsed by koalas) and AKHT (species that provide shelter or other resources) within bioregions (Youngentob, Marsh and Skewes, 2021). Surveys recorded six species that are LIKT in the Brigalow Belt bioregion and five species that are AKHT (Table 3-11).

Mitchell (2015) lists the primary koala food tree species in the SBRC area as *Eucalyptus tereticornis*, which occurs as a dominant species in areas of RE 11.3.25 within the Project Site. Surveys also recorded seven species identified as secondary koala food species in SBRC (Mitchell, 2015) or SEQ (QPWS, 2002). Two secondary food species, *Corymbia citriodora* (lemon-scented spotted gum) and *Eucalyptus crebra*, are dominant or common canopy species in REs 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6.

Table 3-11 Known koala food/habitat species recorded during surveys

Species	Region				Source*
	SBRC	SEQ	Outside SEQ	Brigalow Belt	
Acacia salicina	-	-	-	Ancillary habitat	Y
Corymbia citriodora	-	Secondary	Yes	Ancillary habitat	Q, D, Y
Corymbia intermedia	-	Secondary	-	Ancillary habitat	Q, Y
Corymbia tessellaris	-	-	Yes	Ancillary habitat	D, Y
Eucalyptus acmenoides	-	-	-	Ancillary habitat	Y
Eucalyptus crebra	-	Secondary	Yes	Locally important	Q, D, Y
Eucalyptus exserta	Secondary	Secondary	Yes	Locally important	M, Q, D, Y
Eucalyptus major	Secondary	Secondary	-	Locally important	M, Q, Y
Eucalyptus melanophloia	-	-	Yes	Locally important	D, Y
Eucalyptus moluccana	-	Secondary	-	Locally important	Q, Y
Eucalyptus tereticornis	Primary	Primary	Yes	Locally important	M, Q, D, Y

* Source: D = DoR 2022b; M = Mitchell 2015; Q = QPWS 2002; Y = Youngentob, Marsh and Skewes, 2021.

Non-remnant areas of vegetation that contain sufficient food and habitat resources can also provide high quality koala habitat (Cristescu *et al.*, 2019; Youngentob, Marsh and Skewes, 2021). Koala records in non-remnant areas of the Project Site were in patches of partially cleared or regenerating eucalypts, such as *Eucalyptus crebra, Eucalyptus citriodora* and *Eucalyptus tereticornis*. These patches generally had a mid-dense canopy cover and some connectivity to similar patches throughout the landscape.

Surveys recorded koalas in remnant, HVR and non-remnant vegetation within the site. Koala habitat within the Project Site and impact area was modelled from field survey data coupled with GIS analysis, incorporated surveyed koala locations within the Project Site, information on koala habitat preferences in the SBRC region, ground-truthed remnant and HVR vegetation, and available mapping of pre-clearing REs (DoR, 2022a, 2022b), woody vegetation foliage projective cover (DES, 2016) and recent clearing (DES, 2016, 2018b).

The habitat model identifies five types of koala habitat present in the Project Site, as identified in Table 3-12.

Table 3-12 Known koala habitat types and descriptions

Habitat type	Habitat description	Ecological function	General modelling rules *(detailed further in text below)*
Preferred foraging and breeding habitat	Areas within the fragmented landscape that form contiguous patches of ground-truthed remnant and high value regrowth eucalypt open forest and woodland vegetation communities containing LIKT. This includes all suitable remnant and regrowth vegetation ground-truthed within the Project Site, excluding vine thicket communities (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).	Preferred foraging and breeding habitat for the species, suitable to support the koala throughout its life cycle. This habitat is considered habitat critical to the survival of the koala.	• all remnant and regrowth vegetation ground-truthed, including REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6, excluding vine thicket communities.
General foraging and breeding habitat	Areas of modified forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This includes non-remnant and regrowth vegetation and considers recent clearing, canopy cover and patch size.	Habitat of higher quality within non-remnant woodlands with reduced foraging availability, potential to support breeding, suitable dispersal corridors. This habitat is considered habitat critical to the survival of the koala.	• pre-clear vegetation mapping containing essential habitat REs, including eucalypt woodland/forest REs 11.3.4, 11.3.25, 11.5.20, 11.7.6, 11.9.5, 11.10.1, 11.11.4a, 11.11.15, 11.12.3 and 11.12.6 • woody vegetation foliage projective cover >125 (2014 Landsat) • no evidence of clearing from 1998 to 2018, based on the Statewide Land and Tree Survey · removing small isolated patches <0.3 ha (as these areas more likely contribute to lower quality habitats) • manual model refinement based on recent (2025) aerial imagery • smooth polygons tool, using Polynominal Approximation with Exponential Kernels (PAEK) algorithm and 200 metre smoothing tolerance • remove holes with Eliminate Polygon Part tool, using “area” parameter in Condition up to two hectares.
Low quality general habitat	Areas of low quality modified forest or woodland potentially containing species that are known koala trees, or shrubland with emergent trees, that connect to higher quality General or Preferred koala habitat. This includes non-remnant vegetation with very sparse coverage.	Habitat of low quality non-remnant woodlands with reduced foraging availability, low potential to support breeding, suitable dispersal corridors or narrow clearings between (allowing safe dispersal)	• based on recent (2023) aerial imagery connects areas of Preferred and General habitat • follows vegetation patch tree lines, taking into consideration lidar tree point and height data to account for edges and narrow cleared areas providing connectivity between the Preferred and/or General habitat layers

		between Preferred and/or General habitat.	• excludes paddocks with sparse to very sparse paddock trees (i.e. dispersal habitat)
Dispersal habitat	Areas that do not provide foraging or breeding habitat opportunities, located between and adjacent to Preferred and/or General habitat patches (including Low quality general) and containing shelter trees in sufficient densities to allow for the safe movement of koalas. This includes areas containing higher densities of paddock trees and some sparser regrowth vegetation. Areas of unvegetated riparian and other corridors not captured in the Preferred or General habitats are also captured in the Dispersal habitat	Limited dispersal through the landscape and refuge in scattered shelter trees (where trees are of suitable size to provide refuge). This habitat is not considered habitat critical to the survival of the koala, but provides a safe intervening matrix for travelling between sites, as justified in the SIA in Section 4.6.7.1.	• based on recent (2025) aerial imagery includes all other areas within the Project footprint, excluding unvegetated areas with no obvious alive refuge paddock trees.
Unsuitable habitat	Areas that do not provide foraging or breeding habitat opportunities, which contain no to limited suitable habitat trees, resulting in an unsafe dispersal corridor	Highly restricted habitat due to lack of refuge trees as a result of historical clearing. Does not provide foraging or breeding opportunities, and is considered unsafe dispersal habitat. This habitat is not considered habitat critical to the survival of the koala, as justified in the SIA in Section 4.6.7.1.	• based on recent (2025) aerial imagery includes unvegetated areas without obvious alive paddock trees of a suitable size to provide refuge while dispersing for koala.

Modelling of koala habitat

Preferred foraging and breeding habitat is modelled using the ground-truthed RE layer, including all remnant and high-value regrowth areas (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6) within the Project Site. As the majority of the site contains non-remnant or regrowth (not considered high-value regrowth) vegetation, a GIS model was developed to map the remaining koala habitat types. This model has been updated since the referral documentation to align with the PER Guidelines definition of koala habitat and the new model of available koala habitat across the Project supersedes that presented in the referral documentation.

The GIS model of koala habitat in non-remnant areas utilised Statewide Landcover and Trees Study (SLATS) land cover mapping for Queensland. This data set measures projective foliage cover of woody vegetation by analysing dry season Landsat satellite imagery with a pixel size of 30 m by 30 m (DES 2016, 2018b). Cover levels vary from 100 (0% foliage projective cover) to 200 (100% foliage projective cover). The 125 threshold cover level was considered to most accurately reflect the distribution of woody to non-woody vegetation cover, provides a reflective model of available koala habitats (General, Low general, Dispersal and Unsuitable habitat), and most accurately represents the habitat where records of koalas have been located within the Project Site.

The foliage projective cover method was validated by comparing the SLATS land cover mapping to lidar data collected from the site in 2019. The two datasets are concordant, with significant trees identified by lidar falling within areas of koala habitat modelled using the 125 threshold cover level of the SLATS dataset.

To determine the areas of General koala habitat available within the non-remnant areas the following mapping rules were applied:

- pre-clear vegetation mapping (DoR 2022a) containing REs that are listed as essential habitat factors for koala (DoR 2022b), including eucalypt woodland/forest REs 11.3.4, 11.3.25, 11.5.20, 11.7.6, 11.9.5, 11.10.1, 11.11.4a, 11.11.15, 11.12.3 and 11.12.6
- woody vegetation foliage projective cover greater than a value of 125, based on Landsat imagery from 2014 (DES 2016)
- no evidence of clearing from 1998 to 2018, based on analyses of change in woody vegetation cover by the Statewide Land and Tree Survey (DES 2018b)
- removing patches smaller than 0.3 ha in size (i.e. removing isolated habitat patches less than 0.3 ha, as these areas are more likely to contribute to Dispersal habitat based on ground-truthed vegetation data)
- manual model refinement based on recent (2025) aerial imagery to remove modelled habitat areas that do not contain vegetation
- applying a smoothing tool to remove the grid-like appearance of the model and more accurately represent boundaries of on-ground vegetation.

To determine the areas of General low quality koala habitat available within the non-remnant areas the following mapping rules were applied:

- manual model refinement based on recent (2025) aerial imagery to include patches containing low quality habitat adjoining and connecting vegetation adjacent to habitat areas modelled by the above steps, this includes areas where Preferred and General habitat thins and provides a sparse – very sparse coverage of trees.

To model Dispersal koala habitat available within the non-remnant areas the following mapping rules were applied:

- based on recent (2025) aerial imagery and includes all other areas within the Project footprint, excluding unvegetated areas with no obvious alive refuge paddock trees.

Unsuitable areas of koala habitat were modelled within the non-remnant areas using the following mapping rule:

- based on recent (2025) aerial imagery and includes unvegetated areas with no obvious alive paddock trees of a suitable size to provide refuge for koala while dispersing.

Koala habitat quality

To supplement available data used, as well as ground-truth and inform the model, a total of 17 sites within the Project Site were assessed with plots of 50 x 100 m traversed and the number of the following trees recorded:

- LIKT (greater than 10 cm DBH)
- AKHT (greater than 10 cm DBH).

Data relating to the topography, level of disturbance and vegetation structure was also captured, in additional to general BioCondition data.

Surveys across the Project Site identified LIKT and AKHT in varying abundance with the highest numbers recorded in sites comprised of regrowth vegetation. Sites within non-remnant vegetation were often located on lower slopes and / or adjacent streams, which supports inclusion of these areas as General habitat. Other non-remnant sites were located on upper slopes but in areas where there has been less disturbance.

Mapped habitat

Part A2 Figure 3-15 shows locations of koala records within the site in relation to the modelled extent of potential koala habitat in remnant/HVR and non-remnant areas. Mapped habitat for koala within the Project Site includes:

- 1,631.71 ha of Preferred habitat
- 4,088.72 ha of General habitat
- 4,321.01 ha of Low general habitat
- 3,370.89 ha of Dispersal habitat
- 4,083.87 ha of Non habitat.

General habitat areas are typically located adjacent to Preferred habitat and represent areas of less intact, non-remnant vegetation which has suffered greater disturbance. A fragmented band of General habitat extends across the site from east to west, connecting intact areas of Preferred habitat on either boundary with smaller patches of Preferred habitat within the Project Site. These areas are connected by Low general and Dispersal habitat which includes riparian and fence line corridors and open areas with sufficient tree abundance to provide shelter and foraging resources for koala while dispersing through the landscape. Wide unvegetated areas which offer no foraging or shelter resources have been excluded.

Importantly, the modelled habitat incorporates all known koala records within the Project Site and includes numerous internal corridors that connect most larger patches of koala habitat across the site, which koalas would use for dispersal. Internal corridors are generally associated with more rugged terrain and larger watercourses (although the model does not capture some heavily cleared watercourses).

Much of the Project Site and surrounding region is significantly fragmented by previous clearing. Areas to the east and south are extensively cleared for cropping and provide very limited connectivity. However, broken areas of vegetation provide some connectivity northwards to Dangore State Forest (approximately 5 km north of the site) and westwards to Diamondy State Forest (approximately 5 km west of the Project Site). The Boyne River may also act as a riparian corridor, although the riparian zone is mostly heavily cleared with only a narrow band of woody vegetation along the banks.

The Project Site predominately contains dry sclerophyll forest and open woodland and no defined areas of cool microclimate forest or woodland are known to occur within the Project Site. Areas considered potential refuge under future climate change scenarios include refugia such as drainage lines, riparian zones and more mesic patches contribute to a location’s resilience to drying conditions and are likely to provide a cooler refuge during periods of bushfire and heatwaves.

The Project Site contains some riparian corridors along generally ephemeral watercourses and gullies primarily occurring within the mapped General habitat. However, the vegetation is predominately dry sclerophyll forest and open woodland, unlikely to provide cooler refuge during periods of bushfire or heatwaves. The riparian areas along the Boyne River provide the most likely patches of refugia, where some isolated riverine pools may persist beyond the wet season. However, many of these isolated pools would not persist longer term through periods of drought. Therefore, the Project Site is unlikely to be considered suitable to provide future climate change resilience habitat to prevent against desiccating conditions for the koala.

3.4.2 Greater glider (southern and central)

3.4.2.1 Ecology and habitat requirements

Taxonomy

The greater glider (southern and central) is listed as endangered under the EPBC Act. The taxonomy of greater gliders is currently unresolved, with recent genetic, distributional and morphological studies (Jackson, 2015; Jackson and Groves, 2015; McGregor *et al.*, 2020) suggesting that the greater glider comprises at least three species or subspecies:

- Northern greater glider (*Petauroides minor* of McGregor *et al.*, 2020a) – occurs north of Townsville in northern Queensland, listed as vulnerable under the EPBC Act as *Petauroides minor.*
- Central greater glider (*Petauroides armillatus* of McGregor *et al.*, 2020a) – occurs from Townsville region to northern New South Wales, not currently recognised as a species separate to the southern greater glider in Commonwealth legislation but listed as endangered under the EPBC Act as greater glider (southern and central) (*Petauroides volans*).
- Southern greater glider (*Petauroides volans* of McGregor *et al.*, 2020a) – occurs from northern New South Wales to Victoria (i.e. does not occur in Queensland), not currently recognised as a species separate to the central greater glider in Commonwealth legislation but listed as endangered under the EPBC Act as greater glider (southern and central) (*Petauroides volans*).

The greater glider population in the Kingaroy region is therefore considered to be the central greater glider (*Petauroides armillatus*) by McGregor *et al.*, 2020a and greater glider (southern and central) (*Petauroides volans*) under Commonwealth legislation. The status of greater glider (southern and central) was upgraded from vulnerable to endangered under the EPBC Act in June 2022.

General habitat requirements

The EPBC Act conservation advice for greater glider (southern and central) identifies suitable habitat as eucalypt forests or woodlands that contain hollow-bearing trees, with highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows (DCCEEW, 2022b). The greater glider (southern and central) travels through the landscape almost entirely by gliding between trees, and primarily feeds leaves, buds, and flowers of eucalypts (DCCEEW, 2022b). The species is an obligate hollow dweller, with individuals denning in tree hollows during the day, and during the breeding season young are typically born in autumn (DCCEEW, 2022b).

The national population of greater gliders (southern and central) is believed to be over 100,000 mature individuals (Woinarski, Burbidge and Harrison, 2014). Population density in coastal lowland forest near Maryborough ranged from 1.6 to 2.3 individuals per hectare (Kehl and Borsboom, 1984), while density in dry sclerophyll forest in Barakula State Forest ranged from 0.1 to 0.36 individuals per hectare (Smith, Mathieson and Hogan, 2007). Population density was lower in areas with low availability of den trees containing suitable large hollows (Smith, Mathieson and Hogan, 2007).

Queensland habitat for the species

Eyre *et al.* (2022) reviewed greater glider (southern and central) distribution and habitat information in Queensland and identified potential habitat as:

- Habitat – REs with confirmed greater glider (southern and central) records or identified by experts as potential greater glider (southern and central) habitat.

- Potential habitat – areas containing REs that do not have records of greater glider, but are considered suitable habitat and have suitable habitat attributes, such as hollow-bearing trees, feed trees, large trees and habitat connectivity (but not necessarily containing all attributes).

Important habitat attributes identified in the review included:

- Dominant or co-dominant species in most greater glider (southern and central) habitat in Queensland were *Corymbia citriodora, Eucalyptus moluccana, E. tereticornis, E. crebra, C. intermedia* and *E. portuensis*.
- Trees with a DBH greater than 30 cm are preferentially selected for foraging while trees with a DBH greater than 50 cm are more likely to provide suitable tree hollows for greater glider use.

3.4.2.2 Habitat critical to the survival of the species

The *Conservation advice for Petauroides volans (greater glider (southern and central))* (DCCEEW, 2022b) considers habitat critical to the survival of the greater glider (southern and central):

- large contiguous areas of eucalypt forest containing mature hollow-bearing trees and a diverse range of preferred feed trees
- smaller or fragmented habitat patches connected to larger patches of habitat that facilitate dispersal
- cool microclimate forest / woodland areas
- areas identified as refuges under future climate change scenarios
- short-term or long-term post-fire refuges that allow the species to persist, recover, and recolonise
- habitats available on site meet some of these criteria and are discussed further in Section 3.4.2.7.

3.4.2.3 Known threats

The greater glider (southern and central) is impacted by several threatening processes (DCCEEW, 2022b):

- changing fire regimes (increasing frequency and intensity of fires) causing direct mortality, loss of feeding trees, loss of suitable denning hollows, and exacerbating fragmentation
- habitat clearing causing loss of feeding and denning trees
- habitat fragmentation restricting dispersal between patches of suitable habitat (the species has low dispersal ability through cleared areas and is restricted by gliding distance)
- timber harvesting removing hollow-bearing trees in particular
- entanglement in barbed wire fencing
- changes in temperature and rainfall due to climate change causing loss of feeding trees, reduction in the extent of suitable habitat, reduced nutritional content of leaves, or direct mortality due to heat stress
- hyper-predation by native owls in some areas may cause decreases in local populations
- competition with native species such as sulphur-crested cockatoos for hollows may affect breeding success in greater gliders
- predation by feral cats and European red foxes, most likely when greater gliders are forced to traverse the ground (e.g. during bushfires).

3.4.2.4 Observed habitat use

Spotlighting surveys recorded 76 greater gliders (southern and central) in 60 locations, including:

- 36 gliders inside the Project Site

- 40 gliders outside the site (predominately along Kingaroy Burrandowan Road, but also in properties to the east that are now excluded from the Project Site, in habitat identical to that occurring in the site).

Greater gliders (southern and central) were predominantly recorded on hill crests in remnant forest containing REs 11.11.4, 11.11.15, 11.12.3 and 11.12.6. These REs are dominated by known feed and denning trees for the greater glider including *Eucalyptus crebra*, *Eucalyptus tereticornis*, *Angophora leiocarpa* (smooth-barked apple) and *Corymbia citriodora* (Eyre *et al.*, 2022). Additionally, two individuals were recorded in HVR vegetation adjacent to remnant forest. Habitat assessments confirmed that these REs and the riparian RE 11.3.25 contained trees with large hollows suitable for denning by greater gliders (southern and central). A significant number of sightings occurred along Kingaroy Burrandowan Road, which is relatively high in elevation and consists of a wider patch of open forest with large mature eucalypts with larger hollows, than compared to Ironpot Road or the remnant areas along Jumma Road. Greater gliders were observed within large hollows along Kingaroy Burrandowan Road. The large patch of remnant habitat in the north west of the Project Site, consists of sparse tall eucalypt forest (RE 11.11.4 and 11.11.15), interspersed with old eucalypts with large hollows. Both of these high density areas of greater gliders, provides suitable denning habitat interspersed with suitable feed trees.

Sightings of greater glider in the Project Site are therefore consistent with what is known about the species' preference for older growth habitat with abundant hollows.

3.4.2.5 Denning and foraging resources

Availability of den trees is a key limiting resource for greater glider (Andrew et al., 1994; Lindenmayer et al., 2021; A. Smith, Andrews, et al., 1994; A. Smith, Moore, et al., 1994). Den trees for greater glider preferably have large hollows with a diameter greater than 10 cm. Old, large trees are preferred, and dead trees may also be used (DCCEEW, 2022). A study by Smith et al (2007) determined that some SEQ individuals utilised multiple den trees, with between four and twenty different trees being used.

Food trees for greater glider in Queensland were identified (Eyre et al., 2022) and include any species previously recorded as being used by greater glider. Almost all the species confirmed on-site are listed as dominant or co-dominant in more than 30 greater glider habitat REs within the Brigalow Belt bioregion (Eyre et al., 2022).

The presence of trees of suitable size for hollows and foraging species can be used to distinguish between key and future habitats. Greater glider will use patches of habitat less than 10 ha and potentially less than 3 ha (Eyre *et al.*, 2022). In this regard any ground-truthed area of an RE with confirmed records can have value, regardless of the level of habitat fragmentation in the area. It is noted however that greater gliders disperse poorly across vegetation that is not native forest (Pope, Lindenmayer and Cunningham, 2004) and non-remnant and native regrowth areas have been included to enhance future habitat values and connectivity.

Important patches of habitat with large hollows have been observed in particular along Kingaroy Burrandown Road and within the large remnant patch of vegetation in the north west of the Project Site.

At a total of 21 sites within the Project Site, plots of 50 by 100 m were traversed and the number of the following trees recorded:

- habitat trees (any species of tree) greater than 30 cm DBH
- habitat or potential den trees (any species of tree) greater than 50 cm DBH
- food trees (from Table 3-11) greater than 30 cm DBH.

Food and habitat trees greater than 30 cm DBH were present at all but two survey sites. Four non-remnant sites contained no habitat trees greater than 50 cm DBH. Recorded density of habitat trees greater than 50 cm DBH ranged from 2–18 trees per hectare. In southern Queensland, Eyre et al. (2022) states that greater glider appears to require at least 2–4 live den trees for every 2 ha of suitable forest habitat and the Project Site meets this attribute at most of the surveyed sites.

3.4.2.6 Roads and fragmentation

Greater gliders (southern and central) glide between trees as a primary means of dispersal in the landscape. While the species is capable of walking on the ground, it is described as "extremely clumsy

and slow" (Harris and Maloney, 2010), and makes individuals more vulnerable to predation, potentially by cats and European red foxes (DCCEEW, 2022b). It's been reported that the greater glider is capable of glides up to 100 m (McCarthy and Lindenmayer, 1999), though the average gliding distance of the species is not well documented. In one study, the smaller yellow-bellied glider (*Petaurus australis australis*) was observed to have an average gliding distance of 25 m and a maximum distance of 45 m (Goldingay, 2014), though maximum gliding distances for the species may be 120 – 140 m (DAWE, 2022b).

Gliding distance is directly related to launch height, so the higher a glider launches from the further the potential glide. Taylor and Goldingay (2009) predict that wooden glider poles 20 m high should facilitate a glide distance of approximately 33 m. However, they also note that while smaller gliders were observed using glider poles, greater gliders were not, and more research is required to demonstrate the efficacy of glider poles in increasing connectivity for the greater glider. Further research by Goldingay (2014) reported a mean glide ratio of 2.0 (glide angle of 27.3°) for the yellow-bellied glider in 20-30 m high open forests in Victoria and that this should be used to estimate gliding distance for yellow-bellied gliders when developing connectivity management for the species. The gliding ability of species is dependent on the area of the gliding membrane and other morphological attributes, as such it is reasonable to conclude the gliding behaviour and distance, although also determined by canopy structure, are similar for all gliding marsupials of similar attributes such as the yellow-bellied glider and greater glider. Therefore, a maximum glide distance of 2.0 and a precautionary glide ratio of 1.6 has been adopted for the purpose of this assessment.

Within the Project Site mapped habitats for greater glider are generally not fragmented by distances that exceed typical glide distances. At one site on Jumma Road, linear electrical infrastructure is to be installed parallel to, but offset from, the existing road. This will effectively create a wider than usual corridor, varying between 35 m – 120 m wide. This area is ground-truthed RE containing greater glider records and is mapped as Preferred habitat. Notwithstanding the remnant status, most vegetation in this area has a sparse understorey with limited leaf litter and rocky substrates. Surveys have recorded greater glider at this site and these records are shown on Part A2 Figure 3-16. Assessment of greater glider habitat fragmentation is discussed further in Section 4.6.9.1.

To minimise impact to greater glider, the works at this locality have been designed to incorporate two residual patches of vegetation, approximately 20 – 30 m wide and 200 - 300 m long, to facilitate movement across Jumma Road. Ideally clearing should be kept to less than the maximum glide distance dependent on tree heights of adjacent habitat and a glide ratio of 1.6 - 2.0 wherever possible. Although there is limited research of glide pole use by greater gliders, which are considered to have high site fidelity and limited dispersal (Suckling, 1982; A. C. Taylor et al., 2007), there are studies to show glide poles have been successful at repeated use by more active species such as yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (B. D. Taylor & Rohweder, 2020). Vegetation at this site was ground-truthed as RE 11.12.6 *Corymbia citriodora* open forest with an average canopy height of 28-30 m, however this RE can have tree heights of up to 50 m which assists with gliding. Installation and monitoring of glide poles in the rural environment of the Project Site to facilitate the crossing of the Jumma Road corridor will inform the degree of success of this mitigation measure.

3.4.2.7 Project Site habitat mapping

Modelling was undertaken to map potential areas of greater glider habitat across the Project Site and to identify the relative importance of different areas. This modelling uses the criteria outlined in Section 3.4.12.1 (from Eyre *et al.*, 2022), on-ground data related to feed tree presence and tree DBH (as an indicator of potential hollow size) and defined mapping rules . The habitat model identifies three types of greater glider habitat present in the Project Site, as identified in Table 3-13.

Table 3-13 Known greater glider habitat types and descriptions

Habitat type	Habitat description	Ecological function	General modelling rules (detailed further in text below)
Preferred foraging and denning habitat	Areas within the fragmented landscape that form contiguous patches of ground-truthed remnant and HVR eucalypt open forest and woodland vegetation communities containing greater glider food and den tree species. This includes all suitable remnant and regrowth vegetation ground-truthed within the Project Site, excluding vine thicket communities (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).	Preferred foraging and denning habitat for the species, suitable to support the greater glider throughout its life cycle. This habitat is considered habitat critical to the survival of the greater glider.	• all remnant and regrowth vegetation ground-truthed, including REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6, excluding vine thicket communities.
Potential foraging and future denning habitat	The definition suggested by Eyre et al (2022) cannot be applied in this case as there are no REs on the Project Site with suitable habitat attributes but with no confirmed greater glider records. Non-remnant vegetation, containing greater glider food trees and future denning trees, in proximity to Preferred habitat and / or with substantial connectivity. This includes non-remnant and regrowth vegetation and considers recent clearing, canopy cover and patch size.	Habitat of higher quality within non-remnant woodlands with reduced foraging availability, potential to support future denning for the species and suitable dispersal corridors. This habitat is considered habitat critical to the survival of the greater glider.	• pre-clear vegetation mapping containing essential habitat REs, including eucalypt woodland/forest REs 11.3.4, 11.3.25, 11.5.20, 11.7.6, 11.9.5, 11.10.1, 11.11.4a, 11.11.15, 11.12.3 and 11.12.6 • woody vegetation foliage projective cover >125 (2014 Landsat) • no evidence of clearing from 1998 to 2018, based on the Statewide Land and Tree Survey • removing small isolated patches <0.3 ha • manual model refinement based on recent (2023) aerial imagery • smooth polygons tool, using Polynomial Approximation with Exponential Kernels (PAEK) algorithm and 200 m smoothing tolerance • remove holes with Eliminate Polygon Part tool, using "area"

Habitat type	Habitat description	Ecological function	General modelling rules (detailed further in text below)
			parameter in Condition, up to 2 hectares.
Dispersal habitat	Areas of low quality modified non-remnant forest or woodland potentially containing some food tree species, that connect to Preferred or Potential foraging and future denning habitat. This includes non-remnant vegetation with sparse coverage.	Habitat of low quality non-remnant woodlands with reduced foraging availability, very low potential to support denning, suitable dispersal corridors or narrow clearings between (allowing safe glide dispersal) between Preferred and/or Potential habitat.	• based on recent (2023) aerial imagery connects areas of Preferred and Potential habitat • follows tree lines, taking into consideration lidar tree point and height data to account for edges and narrow cleared areas providing connectivity between the Preferred and/or Potential habitat layers • excludes paddocks with sparse to very sparse paddock trees (i.e. where scattered trees do not consistently support suitable glide distances)

Modelling of greater glider habitat

Preferred foraging and denning habitat includes key denning and foraging habitats – this is modelled using the ground-truthed eucalypt forest and woodlands with confirmed greater glider records and where greater glider food and den tree species are known or likely to be present. This includes all ground-truthed remnant and HVR REs within the Project Site excluding vine thicket communities (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).

To determine areas of Potential foraging and future denning habitat available within the non-remnant areas the non-remnant koala model (General habitat) was utilised, and the following additional mapping rules were applied:

- identification of areas with suitable tree heights, patches with higher densities of trees and suitable glide distances
- manual model refinement based on recent (2025) aerial imagery to include adjoining and connecting vegetation adjacent to Preferred foraging and denning habitat areas.

To determine are of Dispersal habitat available within non-remnant areas the following mapping rules were applied:

- based on recent (2025) aerial imagery map areas containing low quality non-remnant woodlands where vegetation thins and provides a sparse – very sparse coverage of trees
- identification of areas with suitable glide distances (based on Lidar data) to connect areas of Preferred foraging and denning and Potential foraging and future denning habitat
- exclude paddocks with sparse of isolated eucalypts, where glide distances between trees is unsuitable.

Mapped habitat

Modelling of Preferred foraging and denning habitat, Potential foraging and future denning habitat and Dispersal habitat is presented in Part A2 Figure 3-17. This figure also shows the location of greater glider observations across the Project Site. Mapped habitat for greater glider within the Project Site includes:

- 1,631.71 ha of Preferred foraging and denning habitat
- 4,096.2 ha of Potential foraging and future denning
- 4,113.67 ha of Dispersal habitat.

Greater glider observations are almost all within mapped Preferred foraging and denning habitat, with two individuals sighted at one location within Potential foraging and future denning habitat. At those survey sites that correspond with previous observations, both food trees greater than 30 cm DBH and potential den trees greater than 50 cm DBH were present. Ground-truthed REs represent six of the surveyed sites and generally recorded higher numbers of greater glider food trees (six of the nine highest totals for food, habitat and den trees). Combined with the den tree density recorded across most sites, the modelled Preferred habitat and Potential habitat areas are considered to be reflective of greater glider habitats across the Project Site.

Table 3-14 Assessment of greater glider habitat critical habitat criteria

Habitat critical to the survival of the species	Tarong West Wind Farm available habitat
Large contiguous areas of eucalypt forest containing mature hollow-bearing trees and a diverse range of preferred feed trees	The Project Site contains patches of remnant vegetation that contain hollow bearing trees, however there are no large contiguous areas within the Project Site. On the eastern edge adjacent to the Project Site there is a large contiguous patch of suitable glider habitat running north - south that connects to habitat along Kingaroy-Burrandowan Road and then habitat further to the north of the Project Site.

Smaller or fragmented habitat patches connected to larger patches of habitat that facilitate dispersal	Smaller patches of both Preferred and Potential habitat occur within the Project Site. Preferred habitat patches are fragmented by approximately 1.5 and 4 km. Between these patches there are smaller fragmented areas of both Preferred and Potential habitat (refer Part A2 Figure 3-15). This most prominent connection runs east to west through the centre of the site, but is limited in both the north west and south east sections of the Project Site. The distances between these patches of Potential habitat is in the order of 10s to 1,000s of meters depending on the location within the Project Site. Riparian biodiversity corridors through the site connect through to the state biodiversity corridor at the south of the Project Site, which connects Diamondy State Forest and Bunya Mountains.
Cool microclimate forest / woodland areas	The Project Site predominately contains dry sclerophyll forest and open woodland and no defined areas of cool microclimate forest or woodland are known to occur within the Project Site.
Areas identified as refuges under future climate change scenarios	Areas considered potential refuge under future climate change scenarios include those with high density of greater gliders, presence of suitable feed and denning trees, and areas protected against desiccating conditions (Kearney, Wintle and Porter, 2010). The Project Site contains Preferred and Potential (and future) habitat for greater glider, however the vegetation is predominately dry sclerophyll forest and open woodland. Therefore, the Project Site is unlikely to provide future climate change resilience habitat to prevent against desiccating conditions.
Short-term or long-term post-fire refuges that allow the species to persist, recover, and recolonise	Greater glider populations are negatively affected by high severity fires (May-Stubbles, Gracanin and Mikac, 2022). Areas that are not frequently burnt are likely to provide refuge. The Project Site is currently managed as agricultural land and low-intensity grass fires are sometimes lit to manage grass, which may reduce the frequency of high-intensity fires in the Project Site. Development of the site will be in accordance with the Bushfire Management Plan.

3.4.3 White-throated needletail

3.4.3.1 Ecology and habitat requirements

The white-throated needletail is listed as vulnerable and migratory under the EPBC Act. This species migrates into eastern and south-eastern Australia in spring, and begins to leave Australia in autumn, breeds in the northern hemisphere during the Australian winter (Threatened Species Scientific Committee, 2019). Breeding occurs in breeding grounds in Siberia, China, and Japan, and the species nests within tree hollows (typically most numerous in old growth coniferous forests) (Tarburton, 2014; DCCEEW, 2024d).

In Australia white-throated needletails are mostly aerial, reaching heights up to 1,000 m, and may occur singly or in large flocks. They fly above most habitats, although they are most common above wooded areas. Although previously believed to never land while in Australia, they have now been recorded roosting in dense foliage or tree hollows (Tarburton, 1993; Threatened Species Scientific Committee, 2019; Vanderduys, MacDonald and Pavey, 2024). The white-throated needletail feeds aerially on insects, and often occurs in association with storm fronts which generate uplifts that carry insects into the air (DCCEEW, 2024d).

Studies using geolocators have shown that white-throated needletails move up and down the eastern coast of Australia and the Great Dividing Range and are capable of moving up to 900 km in a 24 hour period (Yamaguchi *et al.*, 2021). Within Australia the area of occupancy of white-throated needletail is greater than 18,000 km^2 (Threatened Species Scientific Committee, 2019). The draft referral guidelines for migratory species (DoE, 2015) considers 100 individuals to be an internationally significant proportion of the population and 10 individuals to be a nationally significant proportion of the population.

3.4.3.2 Known threats

Threats to the white-throated needletail in Australia include collision with built structures (overhead powerlines, wind turbines, and windows), loss of roosting habitat, and potentially organochlorine poisoning / reduction of insect populations by organochlorine usage (Threatened Species Scientific Committee, 2019). White-throated needletail mortalities have been recorded at wind farms in Tasmania (Hull *et al.*, 2013) and Victoria (Moloney, Lumsden and Smales, 2019), but the extent to which wind turbine collision represents a threatening process to the species is not understood.

Clearing of old-growth forests in the breeding range of the species in Siberia is likely to be a significant driver of worldwide population decline, through the removal of hollow-bearing trees and reduction in available insect prey (Tarburton, 2014).

3.4.3.3 Observed habitat use

White-throated needletails were recorded flying above the Project Site during the spring 2018 (n = 2), spring 2021 (n = 1), summer 2022 (n = 12), spring 2022 (n = 26), summer 2023 (n = 191), and spring 2023 (n = 132) bird surveys. The volume and timing of sightings is not unexpected, as surveys have been conducted for six consecutive years and the species has a widespread distribution in Australia (Threatened Species Scientific Committee, 2019). Migration into Australia generally occurs in spring, and migration to breeding grounds in the northern hemisphere occurs in early / mid-autumn (Threatened Species Scientific Committee, 2019), so the timing of sightings on the Project Site (all sightings made in spring and summer) is concordant with what is known about the species movements in Australia. The majority of sightings were made during midday and afternoon surveys (Table 3-15), with only 4 individuals out of a total of 364 being observed during morning surveys. It is important to note that the total number of sightings does not necessarily equal an equivalent number of individual birds, as repeated sightings of the same individuals may occur over survey days and periods.

Table 3-15 Seasonal and time of day distribution of white-throated needletail sightings

Time of day	Group sizes	Total individuals observed
Spring		
Morning	2	2
Midday	4, 5, 7, 21, 100	137
Afternoon	1*, 1, 20	22
Summer		
Morning	1, 1	2
Midday	5, 40, 50	95
Afternoon	1, 1, 1, 2, 2, 3, 4, 6, 12, 31, 43	106
***observation made during dam survey**		

The larger numbers recorded during summer 2022, summer 2023, and spring 2023 were generally associated with summer storms. Most birds observed in these summer periods were foraging in front of the summer storms. Group sizes in summer 2023 were variable, ranging from individual birds to flocks of approximately 50 individuals. Group sizes in spring 2023 were likewise variable, ranging from individual birds to a flock of approximately 100 individuals. No white-throated needletails were observed roosting during surveys. White-throated needletails are moderate-sized birds (approximately 20 cm in length, DCCEEW, 2024d) and do exhibit eye-shine (Vanderduys, MacDonald and Pavey, 2024), so should have been detectable during nocturnal spotlighting surveys.

The time spent by each individual or flock in the observed survey area was not explicitly recorded during field surveys, but commonly flocks/individuals would only be observed for part of the 30 minute survey, and may move away and reappear several times in a survey. Flight behaviours were almost always typical of foraging behaviour, with flocks and individuals moving rapidly backwards and forwards in the air in a loose association. Flocks may remain static in the one area for some time or drift backwards and forwards over the landscape. No large flocks were observed “traversing” the Project Site in one consistent direction.

White-throated needletails were observed most commonly over grasslands, but also over or adjacent eucalypt woodland / forest, and on one occasion over a farm dam. Approximately 90% of the Project Site is comprised of grassland or exotic pasture, so it is not surprising that the majority of sightings were

made over this habitat type. Sightings were also distributed across the Project Site, with sightings made in the north, east, south, west, and central areas of the site. Given that sightings were distributed across the Project Site and the different habitat types available, it is reasonable to assume that all airspace above the Project Site is potential foraging habitat for the species.

3.4.3.4 Project Site habitat mapping

White-throated needletails have only been observed aerially and none were observed roosting across the Project Site, though they may occasionally roost (Threatened Species Scientific Committee, 2019). Potential roosting habitat for white-throated needletail has been modelled as all remnant and HVR vegetation within the Project Site.

The Project Site contains approximately 1,631.71 ha of potential roosting habitat for the species (321.35 ha HVR and 1,310.36 ha remnant) and potential foraging habitat includes all airspace above the Project Site (approximately 17,500 ha footprint). Habitat for white-throated needletail is identified in Part A2 Figure 3-18.

Section 4.0 Impact assessment

Impact Assessment

4.1 Summary of Impact Assessment

Table 4-1 Summary of predicted residual impacts to MNES

Species	Habitat description	Individual sightings	Likelihood of occurrence	Relevant impacts	Habitat impact area	Significant residual impact outcomes
koala	A range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by *Eucalyptus* species – food and shelter trees. • Preferred foraging and breeding habitat – contiguous areas of ground-truthed remnant eucalypt open forest and woodlands containing LIKT. This includes all ground-truthed Regional Ecosystems (REs) within the Project Site excluding vine thicket communities (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6). • General foraging and breeding habitat – areas of forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This includes non-remnant and regrowth vegetation and considers recent clearing, canopy cover and patch size. • General foraging and breeding habitat (low quality) - areas of low quality modified forest or woodland potentially containing species that are known koala food trees, or shrubland with emergent food trees, that connect to higher quality General or Preferred koala habitat by narrow clearings between (allowing for safe dispersal). This includes non-remnant vegetation with very sparse coverage. • Dispersal habitat – areas that do not provide foraging or breeding habitat opportunities, located between and adjacent to Preferred and/or General	16 sightings, 21 other detections (scats or scratches)	Confirmed	Potential impacts include those at ground level, such as vegetation removal, habitat fragmentation and edge effects, habitat disturbance and injury / mortality. No impacts from turbine collision	270.52 ha (15.46 ha of Preferred habitat in remnant vegetation and 115.2 ha of modelled General habitat and 139.86 ha of General low habitat within non-remnant areas) 347.16 ha of Dispersal habitat within non-remnant areas	Likely

Species	Habitat description	Individual sightings	Likelihood of occurrence	Relevant impacts	Habitat impact area	Significant residual impact outcomes
	(including low quality) habitat patches and containing shelter trees in sufficient densities to allow for the safe movement of koalas. This includes areas containing higher densities of paddock trees and some sparser regrowth vegetation. Areas of unvegetated riparian and other corridors not captured in the Preferred or General habitat are also captured in the Dispersal habitat.					
greater glider	Tall eucalypt forests and woodlands. Silent, solitary and nocturnal. Eats gum leaves. Dependent on large tracts of undisturbed, tall forest with suitably large nesting hollows; each animal requires approximately 1.5 ha. • Preferred foraging and denning habitat – this includes ground-truthed eucalypt forest and woodlands with confirmed greater glider records and where greater glider food and den tree species are known or likely to be present. This includes all ground-truthed REs within the Project Site excluding vine thicket communities (REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6). • Potential habitat which includes foraging and potential future denning habitats – the definition suggested by Eyre et al (2022) cannot be applied in this case as there are no REs on the Project Site with suitable habitat attributes but with no confirmed greater glider records. Non-remnant vegetation, containing greater glider food trees and future denning trees, in proximity to Preferred habitat and / or with substantial connectivity has been mapped. This includes non-remnant and	76 sightings (36 sightings within Project Site)	Confirmed	Potential impacts include those at ground level, such as vegetation removal, habitat fragmentation and edge effects, habitat disturbance and injury / mortality. No impacts from turbine collision	270.12 ha (15.46 ha of Preferred foraging and denning habitat in remnant vegetation, and 112.08 ha of Potential foraging and future denning habitat and 142.58 ha of dispersal habitat in non-remnant areas)	Likely

Species	Habitat description	Individual sightings	Likelihood of occurrence	Relevant impacts	Habitat impact area	Significant residual impact outcomes
	regrowth vegetation and considers recent clearing, canopy cover and patch size. • Dispersal habitat - areas of low quality modified non-remnant forest or woodland potentially containing some food tree species, that connect to Preferred or Potential foraging and future denning habitat. This includes non-remnant vegetation with sparse coverage.					
grey-headed flying-fox	Sub-tropical and temperate rainforest, tall open forest, swamps, heaths and urban areas. Roosting sites usually in dense forest adjacent to waterbodies. The species forages within 50 km of camp in flowering trees or rainforests, eucalypts, paperbarks and banksias. Foraging habitat includes important winter and spring flowering vegetation (including *Eucalyptus citriodora, E. crebra, E. tereticornis,* among other species of *Eucalyptus, Castanospermum, Corymbia, Grevillea, Melaleuca*, and *Syncarpia*). On the Project Site secondary foraging habitat is defined as critical to the survival of the species and includes all suitable ground-truthed remnant and regrowth vegetation and non-remnant modelled habitat within 100 m of a stream order 3 or greater watercourse. Tertiary foraging habitat is considered foraging habitat not critical to the survival of the species and includes all suitable non-remnant foraging habitat outside of riparian areas.	12 sightings	Confirmed – foraging only	Low impacts from ground level activities, some removal of foraging habitat. Potential risk of turbine collision present – managed via Bird and Bat Management Plan.	270.51 ha (130.65 ha of potential foraging habitat and 139.86 ha of low quality potential foraging habitat)	Unlikely
white-throated needletail	The white-throated needletail is a non-breeding migrant to Australia (present October-April). It is widespread across eastern and south-eastern Australia but is considered a vagrant in central and western Australia. White-throated needletails are aerial birds, utilising the	364 sightings	Confirmed – aerial foraging only	Low impacts from ground level activities, some removal of possible roosting habitat.	15.46 ha of remnant vegetation	Likely (strike risk only)

Species	Habitat description	Individual sightings	Likelihood of occurrence	Relevant impacts	Habitat impact area	Significant residual impact outcomes
	airspace above forests, woodlands, farmlands and ridge tops (Pizzey and Knight, 2012).			Risk of turbine collision present – managed via Bird and Bat Management Plan.		
south-eastern glossy black-cockatoo	The glossy black-cockatoo is highly dependent on *Allocasuarina* species (Higgins, Peter and Steele, 2001). It inhabits open forest and woodlands on the coastline as well as within the Great Dividing Range where stands of sheoak (especially *Allocasuarina littoralis* and *Allocasuarina torulosa*). Inland populations feed on a wide variety of sheoaks including drooping sheoak, *Allocasuarina diminuta*, *Allocasuarina gymnanthera* and belah (OEH, 2022). 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, Peter and Steele, 2001). On the Project Site the potential breeding habitat containing possible priority nesting locations includes areas within suitable distance from known foraging (1 km), water sources (within 200 m of a dam and 1.5 km of a watercourse) (Mooney and Pedler 2005) and includes trees known to be >8 m high to support a nest at the preferred nesting height. Foraging habitat on the Project Site includes areas of ground-truthed remnant and high value regrowth vegetation which is most likely to contain large hollows and/or contain *Allocasuarina* or *Casuarina* food trees in the understorey.	7 sightings, 22 other detections (feeding signs)	Confirmed	Potential impacts include those at ground level, such as vegetation removal, habitat disturbance and injury / mortality. Potential risk of turbine collision present – managed via Bird and Bat Management Plan.	15.46 ha of potential foraging habitat) and 72.4 ha (108 possible trees) of modelled potential breeding (nesting) habitat	Unlikely
fork-tailed swift	The fork-tailed swift is a non-breeding migrant to Australia. It is widespread across Australia and territories arriving in north west Australia in October and November. Almost exclusively aerial from <1 m to	3 sightings	Confirmed – aerial foraging only	Negligible impacts from ground level activities. Risk of turbine collision present – managed via	Species does not roost in Australia, no impact to habitat	Unlikely

Species	Habitat description	Individual sightings	Likelihood of occurrence	Relevant impacts	Habitat impact area	Significant residual impact outcomes
	1,000 m. Most observed over inland plains in Australia, but sometimes recorded over coastal cliffs and beaches as well as urban areas.			Bird and Bat Management Plan.		
yellow-bellied glider	Large contiguous areas or floristically diverse eucalypt forest, which are dominated by winter flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees. • Dispersal habitat includes areas containing suitable habitat to support the species foraging, denning and gliding when dispersing between subpopulations.	No detections	Possible	Potential impacts include those at ground level, such as vegetation removal, habitat fragmentation and edge effects, habitat disturbance and injury / mortality. No impacts from turbine collision	270.12 ha of dispersal habitat (15.46 ha of remnant and high value regrowth vegetation and 254.66 ha of non-remnant and regrowth vegetation)	Unlikely
wandering peppercress	This species has been found growing in riparian areas associated with open forests. It is commonly abundant in tussock grasslands fringing riparian areas. The species known distribution occurs from the Bunya Mountains, south-east Queensland, to near Tenterfield, in northern New South Wales (DCCEEW, 2024a).	No detections	Possible	Potential impacts include clearing actions, ground disturbance, and pest incursion.	11.68 ha of potential habitat associated with riparian areas	Unlikely
Austral toadflax	This species is typically found in shrubland, grassland or woodland, usually on damp sites. Suitable vegetation types within the Project Site are likely to be limited to woodlands and grasslands in seasonally wet riparian areas.	No detections	Possible	Potential impacts include clearing actions, ground disturbance, and pest incursion.	11.68 ha of potential habitat associated with riparian areas	Unlikely

4.2 Potential impacts

This section and the following Sections 4.3, 4.4 and 4.5 provide a summary of the potential impacts to MNES values that may be caused by the construction, operation, and decommissioning of the Project. Impacts fall into broad categories determined by the nature of the proposed action and the environmental values present on-site and can be considered as direct or indirect.

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 may change, but within a defined corridor. This process is termed 'micro-siting' and allows for small changes to the Project design to overcome site constraints. The current clearing footprint represents the maximum proposed clearing area and may be reduced by ongoing refinement in the design and micro-siting of infrastructure.

The potential impacts can be identified and quantified with confidence with the support of desktop and field assessment of the Project Site. For this Project, the impacts are highly predictable due to extensive survey efforts, which provide a clear understanding of the environmental conditions, including flora, fauna, and habitats. Additionally, wind farms are a well-studied type of development, with numerous similar projects assessed and monitored at the international scale. The presence of existing wind farms in the area further supports predictability by offering insights from developed projects, supporting informed impact assessments and mitigation strategies. While some impacts on flora and fauna are unavoidable, they are not irreversible due to planned rehabilitation measures incorporated into the Project decommissioning phase. Whilst there may be short-term disturbances, the long-term, broad-scale impacts are mitigated through counterbalancing strategies, ensuring ecological balance is achieved.

Direct impacts

The construction of a wind farm has the potential to result in significant direct impacts to ecological values, including:

- loss of vegetation communities (remnant vegetation)
- loss of habitat for fauna (which may include remnant, and non-remnant vegetation)
- loss of habitat for threatened flora and fauna species and migratory species
- fragmentation of vegetation through construction of tracks and powerlines
- unintentional injury and mortality of animals through habitat clearance and collision with construction traffic.

In determining the potential loss of vegetation and habitat from construction activities, the following observations have been made:

- wind turbine generator (WTG) locations and associated hardstand areas are contained fully within the clearing footprint.
- proposed access tracks and existing tracks to be upgraded are:
    - designed using detailed contour data to avoid steep terrain, waterways (to avoid areas within 50 m of waterways where possible), and roads (to minimise ingress/egress points onto public roads), supported by site visits to refine designs
    - contained within the clearing footprint
    - powerlines from WTGs to the substation will generally be underground and contained within the proposed planning corridor (although some overhead powerlines will be required).
- larger infrastructure zones will be required during the construction phase in some areas than in the operations phase, to accommodate associated infrastructure (e.g., temporary construction facilities, permanent operation and maintenance facilities, substation, and switching yard). These areas will be rehabilitated post-construction and are all contained within the clearing footprint.

- minor clearing and road widening along a transport route from Brisbane Port to the Project Site as described in the Transport Route Ecological Assessment (Ecosure, 2023b) (refer Appendix S).

Construction of access tracks, WTGs, and supporting infrastructure will likely exacerbate impacts to connectivity by:

- creating wider gaps within vegetation patches or creating new gaps
- increasing edge effects
- further facilitating the introduction of pest animals and weeds into new patches.

During operations, blade vibration frequency has the potential to impact MNES species by disrupting behaviour, communication, and habitat use, particularly for birds, bats, arboreal and ground-dwelling fauna sensitive to noise and vibrations. These disturbances may affect foraging, roosting, breeding or movement patterns, however mitigation measures such as setbacks to habitat and monitoring in accordance with relevant management plans (refer Section 5.0) reduce the associated risk.

Indirect impacts

Indirect (or off-site) impacts include:

- downstream impacts
- upstream impacts, resulting from actions required to undertake an action (such as impacts resulting from extractive resources)
- facilitated impacts, resulting from other actions made possible by the Project.

These indirect impacts may also include:

- introducing and spreading weeds and pathogens and facilitating pest animal movement into new areas
- contributing to erosion and sediment loss into receiving catchments and ecological communities
- generating dust from construction activities.

Surface water quality has the potential to be affected during exposure of topsoil and subsoils, which are then transported into downstream receiving environments from rainfall events. These impacts generally include increases in turbidity (from suspended solids) and mobilisation of pollutants (e.g., fuels, oils, rubbish). Generation of dust has the potential to coat vegetation and, in severe cases, interrupt photosynthetic processes, leading to reduced plant growth or mortality. Vehicles, equipment, and machinery can introduce and spread weed propagules. Disturbances caused by construction activities can also promote pest plant and animal invasions.

Impact management

Impacts of the Project will be addressed in accordance with the impact minimisation hierarchy to:

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

Where possible, the location of supporting infrastructure for WTGs has been sited to avoid impacts to significant vegetation. Furthermore, impacts will be minimised through micro-siting and during the detailed design phase. The potential impacts of proposed infrastructure represent a maximum extent of clearing and are anticipated to be reduced by ongoing refinement in the design and micro-siting of infrastructure.

Assessment of the magnitude of impacts is based on impacts occurring within the entirety of the clearing footprint. Potential impacts are grouped according to the phase of the development, with management and mitigation measures detailed further in Section 5.0.

4.3 Construction phase

The construction of a wind farm has the potential to impact ecological values as a result of:

- clearing of vegetation
- degradation or fragmentation of vegetation and associated habitats
- unintentional injury and mortality of animals through habitat clearance and collision with construction traffic
- introduction and spread of weeds and pathogens and facilitating pest animal movement into new areas
- erosion and sediment loss into receiving catchments
- generation of dust from construction activities.

4.3.1 Vegetation clearing

Clearing of vegetation can result in:

- loss of communities of high ecological significance including vegetation remnant and HVR
- direct disturbance of threatened flora and communities
- direct loss of habitat for threatened flora and fauna species and migratory species
- loss of connectivity between patches of habitat or significant vegetation, restricting fauna movement and the spread of genetic material.

In determining the potential loss of vegetation and habitat from construction activities, the following observations have been made:

- WTG locations and associated hardstand areas are contained within the clearing footprint (Part A2 Figure 1-2)
- proposed access tracks and existing roads and tracks to be upgraded are:
  - designed using detailed mapping of contour data (to avoid steep terrain), waterways (to avoid areas within 50 m of waterways where possible) and roads (to minimise ingress / egress points onto public roads), supported by site visits to refine designs
  - contained within the clearing footprint to allow for micro-siting during the construction phase, if required
- powerlines from WTGs to the substation will be contained within the clearing footprint and generally underground (some overhead powerlines [33 kV and 275 kV] are required as detailed on Part A2 Figure 1-2)
- larger infrastructure zones will be required during the construction phase in some areas than in the operations phase, to accommodate associated infrastructure (e.g. temporary construction facilities, permanent operation and maintenance facilities, substation, and switching yard), and these areas will be rehabilitated post-construction and are all contained within the clearing footprint
- minor clearing and road-widening will be required along a transport route from Brisbane Port to the Project Site, as described in the Transport Route Ecological Assessment (Ecosure, 2023b) (Appendix S).

Where possible, supporting infrastructure for WTGs has been sited to avoid impacts to ecological values. Where possible impacts will be minimised through minor micro-siting and through the detailed design phase. The clearing footprint presented in this PER represents the maximum extent of clearing and the potential direct impacts of this clearing are anticipated to be reduced by ongoing refinement in the design and micro-siting of infrastructure.

The area of remnant (REs) and non-remnant vegetation within the Project Site, the planning corridor and the clearing footprint, are provided in Table 4-2. These areas are used in all calculations relating to impact areas within the Project Site.

Table 4-2 Vegetation areas within the Project Site

	Clearing footprint (ha)	Planning corridor (ha)	Project area (ha)
Non-remnant	856.41	1,910.26	15,838.56
Remnant			
11.12.3	0.89	5.91	33.54
11.12.6	0.42	0.50	11.97
11.11.15/11.3.25	3.78	5.17	456.05
11.12.6/11.11.15	10.09	21.36	63.77
11.11.4	0.003	0.43	462.86
11.12.3/11.7.6	0.28	1.27	103.52
11.3.25	0.00	0.68	23.25
11.11.15	0.00	0.00	162.49
11.11.15/11.5.20/11.3.25	0.00	0.00	0.59
11.11.4/11.12.6	0.00	0.00	5.14
11.12.6/11.12.3	0.00	0.00	333.86
11.8.3	0.00	0.00	0.63
SUB-TOTAL	**15.46**	**35.32**	**1,657.67**
TOTAL	**871.87**	**1,945.58**	**17,496.23**

Clearing vegetation results in the loss of native habitats and habitat features that provide specialised shelter or foraging resources such as hollow-bearing trees (nesting and denning resources for birds and arboreal mammals), woody debris (shelter habitat for reptiles), flowering/fruiting species (food resources for a variety of species) and structurally complex vegetation (shelter habitat for small birds).

4.3.2 Habitat degradation and fragmentation

Clearing vegetation and construction of Project infrastructure such as access tracks, WTGs and supporting infrastructure will impact connectivity in some locations within the Project Site by:

- creating wider gaps within vegetation patches or creating new gaps
- increasing edge effects
- further facilitating introductions of pest animals and weeds into new patches.

Habitat clearing of remnant vegetation at one location within the Project clearing footprint is identified to result in a significant impact to gliders. Alternative routes were considered for this section. However, the proposed design for the access track and high-voltage overhead transmission line route along Jumma Road was selected for the following reasons:

- Utilisation of existing infrastructure: The access track will follow the existing alignment of Jumma Road, which is already cleared. Jumma Road is an existing vehicle track that continues through the Project Site from the south east to the north west of the site. Utilising this existing road reduces the overall impact on the natural environment and habitat fragmentation along the lower parts of the Project Site and in the critical riparian zones of the Boyne River (to the east of Jumma Road).
- Co-location with existing roads: The high-voltage overhead transmission line will run along Jumma Road (the proposed wind farm track), which reduces environmental impact by:
    - Using the already cleared width of Jumma Road as part of the required easement.
    - Reducing the need for additional and excessive access tracks to each transmission line tower (required during construction and operation) due to the proximity to Jumma Road.

- Existing topography: The access track and overhead transmission line alignment was maintained along the ridgeline wherever possible to reduce earthworks and associated clearing, while also avoiding impacts to the waterways and riparian zones (which act as minor movement corridors within the local landscape) along the lower slopes of the ridgeline, to the east. The sides of ridgeline's terrain are steep (>12%, in some areas >18%), shifting off the ridgeline would result in more earthworks and higher clearing impact and construction/operation safety concerns. The overhead transmission line has been designed and placed next to the access track, to avoid further fragmentation that would result from separated cleared corridors for each item of infrastructure (i.e. one for the access track and one for the overhead line).

The lower slopes to the east of Jumma Road and the remnant vegetation patch were investigated as a possible main access route into the Project Site. However, this option is considerably more complex due to steep gradients and undulating terrain, as well as several smaller and higher order waterway crossings. The engineering solutions for this alternative route were considered but would result in the following:

- increased earthworks and a higher level of required clearing of fauna habitat
- a higher risk of access track inundation and downstream impacts (e.g. erosion)
- additional fragmentation of riparian corridors
- the overhead transmission line would be unable to be co-located with the access track (as it requires straight design lines), resulting in increased clearing for transmission installation and maintenance.

4.3.3 Invasive species

Invasive species are known to be present within the Project Site, including 10 weed species listed as restricted matters under the Queensland *Biosecurity Act 2014.* Six species are listed as Weeds of National Significance, including madeira vine (*Anredera cordifolia*), cat's claw creeper (*Dolichandra unguis-cati*), lantana, prickly pear (*Opuntia stricta*), velvety tree pear (*Opuntia tomentosa*) and athel pine (*Tamarix aphylla*). Construction activities and the increased use of the Project Site by vehicles and personnel has the potential to spread weeds throughout the Site and onto areas outside the Project Site via vehicles, machinery and clothing. Disturbances caused by construction activities can also promote pest plant growth, particularly those species which grow well in roadside and disturbed conditions.

Seven pest animal species were recorded during surveys, five of which are restricted matters in Queensland. These include wild dogs, foxes, feral pigs, feral cats and European rabbits which are identified as key threats to several MNES. Feral animals directly predate on native species or displace natives through competition for foraging and other resources. They can be attracted to poorly contained waste, particularly around work sites. They may also benefit from improved access across the Project Site which can increase their local distribution.

4.3.4 Vehicle collisions

Increased vehicles and plant movements increases the chance for wildlife strike. During construction there will be increased numbers of personnel within the Project Site, including drivers unfamiliar with rural conditions and prevalence of wildlife on roads. Koalas are at risk of vehicle strike, especially vehicle movements when koalas are most active (e.g. at night and in the lead up to the breeding season from July to September).

4.3.5 Pollution

During construction there is potential for contamination of water resources as a result of accidental spills and run-off from fuels, chemicals and contaminants (e.g. herbicides, concrete). Light and noise associated with construction can disturb roosting and foraging activities and restrict habitat availability due to avoidance by fauna.

Earthworks and vegetation clearing can mobilise sediments which can enter watercourses if not properly managed, resulting in reduced water quality (and aquatic habitat quality) and potentially leading to downstream impacts. Unmanaged exposed surfaces can also result in deposition of dust and sediment in vegetated areas impacting habitats for flora and fauna.

4.3.6 Fire

The Project Site is currently used for grazing and contains cleared paddocks and patches of remnant and non-remnant vegetation, predominantly eucalypt forests and woodlands with grassy understoreys. The use of earthmoving machinery in grassy areas, vehicles driving or parking in long grass, hot works and people smoking have potential to cause a bushfire during the construction phase.

4.3.7 Altered hydrology

The installation of waterway crossings can have temporary or permanent impacts on flow volumes and velocities, impacting aquatic habitats and fish passage. Impacts on riparian vegetation can alter localised water conditions and result in erosion and sedimentation issues.

Turbines are anticipated to predominately be located on ridges and elevated features of the landscape. Intersection of the water table is considered unlikely. The hydraulic assessment undertaken for the Project (refer Appendix Q: Flood Assessment Report) indicates that the proposed infrastructure and turbine locations remain largely flood-free across all modelled flood events, including various Annual Exceedance Probabilities (AEPs) and climate change scenarios. Model results observed minor changes in flood levels in localised areas around creek crossings and access tracks.

Modelled afflux levels for 20% AEP, 1% AEP and 0.5% AEP events were determined as follows:

- 20% AEP: maximum upstream afflux of 65 mm and downstream afflux of 100 mm
- 1% AEP: maximum upstream afflux of 54 mm and downstream afflux of 270 mm
- 0.5% AEP: maximum upstream afflux of 35 mm and downstream afflux of 230 mm.

4.3.8 Flooding

The implementation of the Erosion and Sediment Control Plan (ESCP) during construction will suitably manage a large portion of rainfall events to prevent erosion and sediment loss into receiving environments. However, there remains potential for a significant rainfall event to cause localised flooding, particularly at new watercourse crossings, and without mitigation measures the construction works may exacerbate the erosion and sediment loss into receiving catchments.

The detailed hydrology report (refer Appendix Q: Flood Assessment Report) prepared for the Project Site assessed hydraulic impacts of existing structures and the installation of nine proposed waterway crossings. Proposed waterway crossings will intersect six major risk (purple) and three high risk (red) waterways for fish passage under the *Fisheries Act 1994*. Hydrological features used to inform the detailed assessment included:

- Ironpot Creek
- Boughyard Creek
- Jumma Creek
- Middle Creek
- Boyen River
- Mannuem Creek
- Other minor drainage paths and unnamed tributaries that intersect the Project Site.

Across all modelled flood events, including multiple AEPs, the proposed infrastructure and turbine locations remain largely flood-free across all modelled flood events, including various AEPs and climate change scenarios. Culvert design for the DAF waterway crossings classified as purple were provided for the assessment were to assess results based on best practice infrastructure to support fish passage.

Modelled results indicated that observed change in flood levels (afflux) is localised, typically occurring near creek crossings and access tracks. Modelling indicated that localised change in flood levels were observed at modelled crossings, resulting in small increases in water levels downstream of the crossings and small decreases upstream. The magnitude of these impacts varies across different flood events and climate change scenarios. Under the 1 % AEP climate change scenario, afflux increases at

most creek crossings. However, no sensitive receptors (e.g. residential, ecological, or cultural assets) are identified within the affected areas and these levels are unlikely to result in changes to the hydrology to the extent that impacts will occur to riparian vegetation communities or species habitat within or downstream of the Project Site.

A sensitivity test for blockage of designed culverts was undertaken which indicated the Project design will result in no change in the water levels or velocities at those crossings, and thereby there will be little impact to downstream environments due to changes in hydrology. The use of design to convey flow by road overtopping reduces blockage to minimum to no impact on design crossings. The results of the hydraulic assessment indicates that suitable hydraulic conditions are to be maintained in the downstream channel to minimise adverse changes in flow velocities, enabling fish passage upstream during low to medium flow conditions.

4.3.9 Impacts on adjoining land

Off-site impacts from the Project may include indirect impacts to surface water quality, dust generation and introduction and spread of weeds and pest animals, all of which have the potential to degrade environmental values beyond the boundary of the Project Site. Surface water quality can be affected during exposure of topsoil and subsoils which are then transported into downstream receiving environments during and after rainfall events. Generally, these impacts include increases in turbidity (from suspended solids) and potentially mobilisation of pollutants (e.g. fuels, oils, rubbish). Generation of dust has the potential to coat vegetation and, in severe cases, interrupt photosynthetic processes leading to reduced plant growth or mortality. Vehicles, equipment and machinery can introduce and spread weed propagules. Disturbances caused by construction activities can also promote pest plant and animal invasions.

4.3.10 Duration of impacts

Construction is expected to take approximately 30 months.

4.4 Operational phase

Operational impacts from the proposed development primarily relate to the potential for injury or mortality of birds and bats from WTG blade strike or barotrauma (the sudden change in pressure experienced by small animals that can damage the lungs) from the motion of WTG blades. Other impacts may include:

- introduced species
- site alienation
- fauna collisions during operational vehicle movements
- pollution
- fire.

4.4.1 Bird and bat mortality from turbine collision and barotrauma

MNES that are at high risk of mortality from turbine collision include white-throated needletail, fork-tailed swift and grey-headed flying-fox. While glossy black-cockatoo may potentially fly at rotor swept area (RSA) height and interact with WTGs.

Barotrauma may affect bats in particular. Changes in air pressure at the tip of the blades may cause sudden expansion of the lungs, particularly in small bats. A risk assessment to WTG strike for birds and bats has been included in the Bird and Bat Utilisation Survey (Ecosure, 2025b) (BBUS) (refer Appendix J).

4.4.2 Site alienation

Noise and disturbance associated with WTG operation may deter fauna species from occupying areas of habitat close to WTGs. This can result in reduced habitat availability and is particularly relevant for species with specialised breeding place requirements such as glossy black-cockatoo and greater glider.

Installation of fences may preclude fauna access to areas of the Project Site. WTG operation may also result in a loss of foraging habitat for aerial species such as white-throated needletail and fork-tailed swift.

4.4.3 Invasive species

Regular vehicle access across the Project Site can result in the spread of weeds from Project infrastructure, particularly along infrastructure corridors. Pest carnivores may be attracted by carrion around the base of WTGs and local populations may increase, potentially impacting native fauna populations. Pest fauna may also utilise infrastructure corridors and access roads to move throughout the Project Site.

4.4.4 Vehicle collisions

Vehicle activity during operations increases the chance for wildlife strike, though to a reduced level during operations. This is most relevant at dusk and dawn, and during koala breeding season when movements increase.

4.4.5 Pollution

Ongoing erosion of soils from tracks, powerline easements and WTG pads can result in reduced water quality in adjacent watercourses. It can also result in deposition of dust and sediment in vegetated areas impacting habitats for flora and fauna.

Light and noise impacts on fauna during operation will be limited (see Site alienation above).

4.4.6 Fire

During the operation phase the potential for impacts on vegetation and associated habitats resulting from bushfire will likely be reduced due to:

- improved ground access through provision of a suitable access network for emergency vehicles which will assist with fire management activities and any fire response (noting that access for aerial operations during extreme events may be restricted by WTGs)
- the potential for WTG to attract lightning strikes, reduce on-ground strikes
- on-ground presence of employees will result in heightened vigilance during fire seasons
- reduced number of vehicles and employees and associated risks (hot works, people smoking).

4.4.7 Climate change

Changes in weather conditions and an increased frequency and severity of natural disasters may lead to site conditions that directly or indirectly affect MNES. The changes may lead to:

- an increase of the occurrence of erosion events (e.g. more frequent or intense rainfall events) that have the potential to affect adjacent habitat due to site-based infrastructure
- loss, fragmentation, or drying of potential climate refugia for MNES that occupy the Project Site or are in the immediate vicinity
- a change to the risk of fire that delivers more frequent or intense fires
- extreme weather events that affect site-based MNES or downstream MNES.

Whilst these impacts may occur at some point during the operational period, the Project itself is delivering a positive contribution to the management of climate change and supporting long-term resiliency ecosystems. Therefore, the potential impacts are considered contextually minor.

4.4.8 Duration of impacts

The operational life of the Project is at least 30 years, excluding construction and decommissioning, and these impacts are anticipated throughout that period.

4.5 Decommissioning phase

Decommissioning or repowering of the Project Site is expected to occur at the end of the Project's useful life. Work areas to support decommissioning tasks will be identical to the construction footprint or smaller in footprint. For example, where temporary hardstand areas used for the construction phase of the Project have been rehabilitated, clearing may be required to allow access for the appropriate crane to disassemble turbines.

New impacts associated with decommissioning are primarily related to:

- disposal, reuse or recycling of WTG components, hardstand and infrastructure
- underground infrastructure – impacts associated with removal or implications of leaving in-situ
- increased risk of weed spread due to increased vehicle movements across the Project Site (as per construction phase)
- increased risk of vehicle collisions with fauna due to increased activity on-site (as per construction phase)
- potential for pollution from accidental spills of fuel or chemicals, and movement of sediment from disturbed areas (as per construction phase), including potential for dust erosion and mobilisation of sediment into watercourses
- increased risk of fire due to increased use of machinery on-site and increased personnel numbers (as per construction).

4.5.1 Duration of impact

If decommissioning occurs, the process is expected to take approximately 24 months.

4.6 Impacts to listed threatened species and ecological communities

4.6.1 Guidelines and assessment definitions

The MNES Significant Impact Guidelines (DoE, 2013b) provide criteria to assess whether a proposed action will have, or is likely to have, a significant impact on threatened species or threatened ecological communities. Assessment criteria for species listed as vulnerable and endangered are presented in Table 4-3.

Table 4-3 Significant impact criteria for vulnerable and endangered species

Vulnerable species	Endangered species
Lead to a long-term decrease in the size of an important population of a species	Lead to a long-term decrease in the size of a population
Reduce the area of occupancy of an important population	Reduce the area of occupancy of the species
Fragment an existing important population into two or more populations	Fragment an existing population into two or more populations
Adversely affect habitat critical to the survival of a species	Adversely affect habitat critical to the survival of a species
Disrupt the breeding cycle of an important population	Disrupt the breeding cycle of a population
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Result in invasive species that are harmful to an endangered species becoming established in the endangered species' habitat
Introduce disease that may cause the species to	Introduce disease that may cause the species to

Vulnerable species	Endangered species
decline	decline
Interfere substantially with the recovery of the species	Interfere with the recovery of the species

When assessing the significance of an action on a vulnerable species, it is necessary to define whether an 'important population' of the species occurs or could potentially occur within the Project Site. An important population is defined as one that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity and/or
- populations that are near the limit of the species' range.

Table 4-4 provides an assessment of important populations for vulnerable species that are known or likely to occur within the Project Site. Endangered species known or considered likely to occur are not included in Table 4-4 as the definition of 'important population' is not used for endangered species, and impacts to these species are assessed on the basis of impacts to any population.

Table 4-4 Assessment of important populations for vulnerable species

Species	Key source population	Maintaining genetic diversity	Limit of the species' range	Important population
Austral toadflax	Unlikely. The species was not detected despite searches within suitable habitat areas. Suitable habitat within the Project Site is likely to be limited to riparian areas.	No. There are many records of the species within the wider region. Much of the vegetation within the Project Site is fragmented and isolated, which limits genetic exchange.	No. The species extends form Carnarvon Gorge to Victoria.	No.
grey-headed flying-fox	No. There are no known camps on the Project Site and no Nationally Important camps within 20 km. There are two relatively small camps located 25 km and 40 km from the Project Site which are likely to be used by the individuals recorded.	No. The grey-headed flying-fox is a highly mobile species, ranging up to 50 km a night from camps. There is no camp within the Project Site and no records of one. The Project Site does not play a significant role in maintaining genetic diversity other than as a potential foraging resource during migration or breeding seasons.	No. Although most of the population occurs along the coastal fringe, the species ranges further west to Chinchilla, Taroom and beyond.	No.
glossy black-cockatoo	No. There are extensive areas of vegetation surrounding the Project Site which are likely to provide similar habitat values. Extensive surveys identified a small number of individuals and evidence of feeding. No nest sites were recorded	No. There are many records of the species within the wider region. Much of the vegetation within the Project Site is fragmented and isolated, which limits genetic exchange.	No. The Project Site is not at the limit of the species' range.	No.

Species	Key source population	Maintaining genetic diversity	Limit of the species' range	Important population
	during any surveys. No essential habitat for this species is mapped within the Project Site. This relatively low level of usage of the Project Site, combined with activity recorded from areas outside the Project Site over several years (Golder Associates, 2018), suggests there is a small population persisting in the wider landscape.			
white-throated needletail	Yes. One six-day survey in summer 2023 recorded up to 191 bird sightings and flocks of approximately 50 birds, which is regarded as a nationally important population (DoE, 2015a). Additionally, a flock of 100 birds was observed in Spring 2023, which is regarded as an internationally important population (DoE, 2015a).	No. There are many records of the species within the wider region. The species does not breed within Australia.	No. The species occurs throughout eastern and south-eastern Australia from late spring to early autumn.	Yes.
Yellow-bellied glider	No. There are no records of the species occurring within the Project Site, but many records in the broader region (15 – 80 km) in areas of contiguous mature old growth forest, which is different habitat from the Project Site. Habitat within the Project Site is marginal and is not regarded as a key source population.	No. There are no records of the species occurring within the Project Site, but many records in the broader region (15 – 80 km) in areas of contiguous mature old growth forest, which is different habitat from the Project Site. The Project Site does not play a significant role in maintaining genetic diversity other than as a potential dispersal area.	No. The Project Site is not at the limit of the species' range.	No.

For both vulnerable and endangered species, habitat critical to the survival of the species is further defined as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development

- for the reintroduction of populations or recovery of the species.

A summary of the impact to species habitat mapped for species confirmed or likely to occur on the Project Site is presented in Table 4-5. Additional fauna species were considered Possible to occur within the Project Site based on historical records within 20 km of the Project Site and some potentially suitable habitat present on the Project Site (refer Section 3, Table 3-7). However, the Project is not considered to have a significant impact to these species on the basis of the low likelihood of these species occurrence (determined from over six years of survey effort across the Project Site) and the limited and/or marginal habitat present to support these species. As such these species have not been detailed further in this Section 4.6.

Table 4-5 Species habitat within the Project Site

Species	Habitat type	Impact area (clearing footprint) (ha)	Remaining immediately adjacent available unimpacted habitat (planning corridor minus clearing footprint) (ha)	Remaining adjacent available unimpacted habitat (Project Site minus clearing footprint) (ha)
Grey-headed flying-fox	Potential foraging habitat	130.65	186.54	5,139.78
Grey-headed flying-fox	Low quality potential foraging habitat	139.86	184.02	4,181.15
Glossy black-cockatoo (south-eastern)	Foraging habitat	15.46	19.97	1,616.25
Glossy black-cockatoo (south-eastern)	Potential breeding (nesting) habitat	72.4 (108 trees)	65.06	1,779.05
Yellow-bellied glider	Potential dispersal habitat	270.12	372.25	9,571.46
Austral toadflax	Preferred habitat	11.68	10.64	953.05
Wandering peppercress	Preferred habitat	11.68	10.64	953.05
Koala	Preferred habitat	15.46	19.97	1,616.25
Koala	General habitat	115.2	166.56	3,973.52
Koala	General habitat – low quality	139.86	184.02	4,181.15
Koala	Dispersal habitat	347.16	365.89	3,023.73
Greater glider	Preferred foraging and denning habitat	15.46	19.97	1,616.25
Greater glider	Potential foraging and future denning habitat	112.08	168.89	3,984.12
Greater glider	Dispersal habitat	142.58	183.39	3,971.09

Species	Habitat type	Impact area (clearing footprint) (ha)	Remaining immediately adjacent available unimpacted habitat (planning corridor minus clearing footprint) (ha)	Remaining adjacent available unimpacted habitat (Project Site minus clearing footprint) (ha)
White-throated needletail	Preferred habitat	15.46	19.97	1,616.25

4.6.2 Measures to avoid, minimise and mitigate impacts

Avoidance, minimisation, and mitigation measures to reduce the impacts of the construction, operation, and decommissioning of Tarong West Wind Farm are discussed in detail in Section 5.0. These measures have been incorporated into the following significant impact assessments for each protected matter and contribute to the assessment of residual significant impacts (after avoidance, minimisation, and mitigation).

4.6.3 Impacts to grey-headed flying-fox

The spring 2021 surveys observed a small number (n=12 over three separate nights) of grey-headed flying-fox foraging on flowering eucalypts within the Project Site. Potential grey-headed flying-fox foraging habitat was modelled as the ground-truthed extent of remnant and HVR vegetation containing flowering eucalypt species and non-remnant areas modelled as containing habitat suitable for grey-headed flying-fox (Part A2 Figure 3-9). There are no known camps within the Project Site or within 20 km of the Project Site. The closest grey-headed flying-fox camp is in the Mt Wooloorin Reserve, almost 25 km from the most north eastern portion of the Project Site. This is not identified as a Nationally Important flying-fox camp on the National Flying-fox Monitoring viewer (DCCEEW 2025). The latest available data for this camp from the National Flying-fox monitoring program is from February 2021 and shows that the camp is a Category 2 camp, occupied by between 500 and 2,499 grey-headed and black flying-fox (DCCEEW, 2024h). The previous camp data shows that grey-headed flying fox has not been detected in previous surveys at the camp since 2012 when monitoring commenced.

The Palms National Park camp is located at Cooyar, 38 km south east of the Project Site, and is also not identified as a Nationally Important camp. This camp has a more consistent presence of grey-headed flying-fox and in recent years has also been consistent with a Category 2 camp (DCCEEW, 2024h).

Grey-headed flying-fox forage over wide ranges to access seasonally available food sources. Westcott et al (2015), referenced in the National recovery plan for the species (DAWE, 2021a), stated that the mean distance that individuals travel from the camp in which the animal had roosted and to which it returns was 10.9 km. While this species is known to travel further, the distance from either of the closest camps to the Project Site and back is well above the average.

Field surveys identified a very low number of individuals, likely associated with the relatively small camps located 25 km and potentially 38 km from the Project Site. Neither camp is identified as a Nationally Important camp and there are a number of protected areas providing suitable foraging resources between the camps and the Project Site (e.g. essential habitat for other species dominated by eucalypt species, reserves and state regulated remnant vegetation). The low numbers recorded on-site, combined with the distance from the nearest camps (both relatively small), the lack of seasonal flowering and fruiting on the Project Site and the availability of alternative foraging resources in the broader region, suggests that the use of the Project Site by this species is likely to be low. The limited loss of foraging resources for this species is therefore unlikely to have a significant impact on this species behaviours and area of occupancy.

The Project Site contains approximately 9,591.44 ha of potential foraging habitat for the grey-headed flying-fox (including 5,270.43 ha of potential foraging and 4,321.01 ha of low quality potential foraging within non-remnant areas). The current design may remove up to 130.65 ha of potential foraging and

139.86 ha of low quality potential foraging habitat for the grey-headed flying-fox, which is 2.82% of potential available foraging habitat within the Project Site. Pre-clearing surveys will be undertaken to allow micro-siting of Project infrastructure that, where possible, minimises clearing of mature eucalypts and other foraging resources such as large fig trees.

Operational impacts to grey-headed flying-fox are likely to be limited to direct strike if travelling within the RSA and disturbance from WTGs to foraging habitat when trees are in flower and fruit. Habitat disturbance will be minimised by micro-siting WTGs as far away as practicable from remnant vegetation. Blade strike issues are assessed and discussed in more detail in Section 4.8.

Provided that mitigation measures in Table 4-6 are successfully implemented, it is unlikely that the proposed infrastructure will result in a significant impact to an important population of the species. An assessment of impacts on grey-headed flying-fox is provided in Table 4-7.

Table 4-6 Impacts and mitigation measures for the vulnerable grey-headed flying-fox

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Habitat loss and disturbance of breeding colony	There is no grey-headed flying-fox camp located on-site. No breeding habitats will be impacted. The Project design will remove up to 270.51 ha of modelled grey-headed flying-fox habitat during the construction phase of the Project. Some maintenance vegetation clearing may be required during operation, to maintain tracks or access to certain areas and some clearing of regrowth vegetation may be required during decommissioning to facilitate plant and vehicle access. However, this will only be within the approved clearing footprint.	• Avoidance of remnant vegetation during the design phase – clearing in modelled grey-headed flying-fox habitat has been minimised by design. • Micro-siting of infrastructure to avoid habitat during construction. • Rehabilitation of cleared areas upon decommissioning.	Measures are considered effective at minimising the effects to grey-headed flying-fox.
Fragmentation of habitat	Grey-headed flying-fox is a highly mobile species, and the degree of fragmentation proposed within the Project Site will not impact the ability of this species to forage. The species will however benefit from any measures to reduce fragmentation as they will by default protect or enhance available habitats.	• Clearing within riparian areas minimised during design phase of construction. • Utilisation of existing roads and tracks in Project design. • Rehabilitation of cleared areas upon decommissioning.	Measures are considered effective to manage the impacts of loss of connectivity.
Increased risk of predation	Risk is likely to be highest during construction when high numbers of personnel are present and habitat disturbance is occurring. Habitat clearing may cause grey-headed flying-fox to move to other foraging habitat areas, concentrating the numbers foraging, which may increase predation from native species such as carpet pythons, goannas, sea-eagles and the powerful owl. These species are unlikely to negatively impact the population due to predation and introduced species, such as cats	• Predator control if signs of increased predator numbers are observed during construction. • Waste management during construction and operation to ensure food wastes are secure and will not attract introduced species. • Implement actions detailed in a project specific pest animal management plan.	Measures are considered effective to reduce the likelihood of the Project exacerbating predation by introduced predators, which is already considered a low risk for this species.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
	and foxes are not common predators to flying-fox species (NSW Wildlife Council, 2010).		
Vehicle strike	Increased vehicle and plant use of the Project Site may increase risk of vehicle strike, particularly where tracks bisect remnant vegetation patches. Risk is likely to be highest during construction when traffic to and within the Project Site is high. Risk will continue throughout the operational phase of the Project (30 – 40 years), though vehicle use and therefore strike risk will be lower during the operational phase.	• Traffic management to minimise collisions during construction and operational phases. • Traffic management measures which will be implemented include limiting access routes, strict implementation of speed limits, and limiting night traffic.	Measures are considered effective to manage the risk of vehicle strike given the low risk this poses to the species given its flight behaviours.
Direct mortality from WTG strike	Impacts are possible during operation of the wind farm. The grey-headed flying-fox forages within and below the canopy and regularly fly below the canopy height but are capable of flying at RSA height.	• RSA height maintained at no less than 65 m above ground height. • WTGs sited as far as practicable from remnant vegetation. • Adaptive monitoring and control program to be implemented in a Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).	Measures are considered effective to manage the risk of WTG strike given the recorded low level of site usage by this species.

4.6.3.1 Significant impact assessment

Table 4-7 EPBC Act significant impact assessment for vulnerable grey-headed flying-fox

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of an important population of a species	Unlikely. Grey-headed flying-fox is considered to exist within a single, national population due to its highly mobile and fluid nature between colonies. Therefore, an important population of grey-headed flying-fox does not occur within the Project Site. The Project Site does not contain an important population of grey-headed flying-fox and there are no Nationally Important camps within 40 km of the Project Site. The Project may clear up to 270.51 ha of potential foraging habitat, including 130.65 ha of potential foraging habitat and 139.86 ha of low quality potential foraging habitat. These two foraging habitats together represent only 2.82% of available potential foraging habitat within the Project Site. There are no known grey-headed flying-fox camps within 20 km of the Project Site. Ample foraging habitat exists within the surrounding landscape (within 50 km of the Project Site in large patches of vegetation). The removal of potential foraging habitat for the Project is unlikely to lead to a long-term decrease in the population size of this species. Operational impacts may include collision with WTGs and behavioural disturbance in potential foraging habitat. Behavioural disturbance will be minimised by micro-siting WTGs as far away as practicable from remnant vegetation. The risk of collisions will be monitored and adaptive management measures applied in accordance with a Bird and Bat Management Plan (Ecosure, 2025a).
Reduce the area of occupancy of an important population	Unlikely. The Project Site does not contain an important population of grey-headed flying-fox. There are no camps within 40 km of the Project Site identified as A Nationally Important camp. The Project may clear up to 270.51 ha of potential foraging habitat, including 130.65 ha of potential foraging habitat and 139.86 ha of low quality potential foraging habitat. These two foraging habitats together represent only 2.82% of available potential foraging habitat within the Project Site. There are no known grey-headed flying-fox camps within 20 km of the Project Site. The Project will result in the loss of some foraging habitat, but large tracts of foraging habitat are present in the surrounding landscape. Therefore, the impact to this highly mobile species is minimal and unlikely to result in a significant reduction in area of occupancy.
Fragment an existing important population into two or more populations	Unlikely. The grey-headed flying-fox is a highly mobile species which occurs as a single national population due to its ability to move between colonies. Ample foraging habitat is available within 50 km of the nearest known camp (38 km south-east of the Project Site). This Project is therefore unlikely to fragment an existing important population of grey-headed flying-fox.
Adversely affect habitat critical to the survival of a species	Likely. Vegetation communities containing potential foraging resources are identified as habitat critical to the survival of the species. Reliable foraging resources in spring are critical to the survival of grey-headed flying-fox to avoid poor reproductive success (DCCEEW, 2023c). The Project Site contains eucalypt species that could provide foraging resources when flowering. The Project will clear up to 270.51 ha of potential foraging habitat but large areas of potential foraging habitats will remain within the Project Site and surrounding landscape. The habitats on-site are not within 20 km of Nationally Important camps and given the distance from other camps within 40 km, are unlikely to provide a key resource during the late stages of pregnancy, birth or lactation. There is also a low level of use of the Project Site expected by grey-headed flying-fox (determined by over six years of seasonal surveys), due to the unreliable seasonal flowering and fruiting of flora species at the

Significant impact criteria	Assessment of the Project Site
	Project Site. Approximately 97.2% of the available foraging habitats on-site will be preserved, however, the Project will remove up to 270.51 ha of potential foraging habitat available to the species.
Disrupt the breeding cycle of an important population	Unlikely. The proposed works will remove 270.51 ha of potential foraging habitat, but large areas of foraging habitat will remain within the Project Site and surrounding landscape, and there are no known camps within 20 km of the Project Site. Given the high mobility of this species and the abundance of flowering eucalypts in the region, the Project is unlikely to disrupt the breeding cycle of grey-headed flying-fox. Nevertheless, as reliable foraging resources in spring are critical to the survival of grey-headed flying-fox, removal of flowering eucalypts should be avoided during this period where possible.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. No roosting grey-headed flying-fox have been observed during field surveys. The proposed works will remove potential foraging habitat, but there are no known camps within 20 km of the Project Site. Given the amount of available foraging habitat remaining within the wider locality, the proposed clearing is unlikely to cause the species' population to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely. Clearing of vegetation which may provide foraging habitat for grey-headed flying-fox has the potential to allow for weed species to establish in place. Provided appropriate mitigation measures (e.g., adopting effective weed hygiene measures and progressive rehabilitation of disturbed areas) are implemented during the proposed works, it is highly unlikely an invasive species will impact the grey-headed flying-fox.
Introduce disease that may cause the species to decline	Unlikely. The impact of disease on flying-foxes is relatively unknown (DAWE, 2021). Grey-headed flying-foxes generally exist in equilibrium with Lyssavirus, but population impacts have been observed when the species is under significant ecological stress (DCCEEW, 2023c). Grey-headed flying-foxes can be susceptible to Angiostrongylosis and a number of other diseases; however, the impact of these diseases at a population level is unknown (DAWE, 2021). It is unlikely the proposed Project works will result in significant ecological stress to the species, and result in increased rates of the disease through the population.
Interfere substantially with the recovery of the species.	Unlikely. National key recovery targets focus on improving the national population trend of grey-headed flying-fox by reducing the impact of threats. Recovery objectives include protecting and increasing foraging habitat, increasing public awareness and improving management of camps (DCCEEW, 2023c). The Project Site contains vegetation which may provide foraging habitat for the species. Though potential foraging habitat is proposed to be cleared as part of the clearing, given the availability of large tracts of vegetation within the wider landscape, this is not considered a substantial interference to this species' recovery.
Overall impact assessment	The proposed Project is considered unlikely to have a significant impact on grey-headed flying-fox, with the implementation of all practical impact mitigation measures, even though up to 270.51 ha of potential foraging habitat is proposed to be removed.

Although the overall assessment was determined to be unlikely to result in a significant impact on the grey-headed flying-fox, the Proponent proposes to incorporate and implement measures in the OMS and OAMP to offset for the loss of the potential foraging resources for the grey-headed flying-fox (270.51 ha critical to the survival of the species) collocated with the proposed offsets for residual significant impacts to koala and greater glider (which would provide sufficient resources to offset for the impact to critical foraging habitat). However, given the low site utilisation by the grey-headed flying-fox, successful detection of the species on the offset site may be difficult and should not be considered a defining factor of offset success.

4.6.4 Impacts to south-eastern glossy black-cockatoo

Surveys sighted seven adult birds and detected orts in 22 locations, confirming glossy black-cockatoos utilise the Project Site for feeding habitat. Several remnant patches and non-remnant areas of vegetation contain *Allocasuarina* and *Casuarina* species. Habitat for glossy black-cockatoo occurs within numerous vegetation communities, including REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3, 11.12.6 (Part A2 Figure 3-3 to Figure 3-8 exhibit RE mapping, Part A2 Figure 3-10 details habitat glossy black-cockatoo habitat mapping).

Comprehensive surveys were completed in accordance with the state government guidelines (Hourigan, 2012) and recommendations in the conservation advice (DCCEEW 2022a). A small number of individuals and evidence of feeding were collected across the Project Site. This, in combination with the existing records near the Project Site, suggest there is a small population occurring within the wider landscape. As outlined in Section 4.6.1, this is not considered to be an important population for the purposes of a significant impact assessment.

A maximum of approximately 15.46 ha of foraging habitat and up to 72.4 ha (containing 108 trees) of modelled potential breeding (nesting) habitat 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 habitat. While 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. Habitat disturbance will be minimised by siting WTGs as far away as practicable from remnant vegetation, in particular areas where (if any) suitable nesting hollows are identified and watering points. The BBUS (Ecosure, 2025b) (refer Appendix J) concluded that the glossy black-cockatoo has a moderate risk of blade strike as the species does not soar, generally flying between roosts and food sources which are below the RSA, and individuals maintain moderate vigilance, however it is known to be able to fly at RSA height which puts it at greater risk of blade strike.

Provided that mitigation measures in Table 4-8 are successfully implemented, it is unlikely that the proposed infrastructure will result in a significant impact to an important population of the species. These include avoidance of habitat and potential nest trees, ongoing survey and monitoring of nest trees, as well as monitoring, revised risk assessments and adaptive management measures in accordance with an approved Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I). An assessment of impacts on glossy black-cockatoo is provided in Table 4-9.

Table 4-8 Impacts and mitigation measures for the vulnerable south-eastern glossy black-cockatoo

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Habitat loss and loss of nesting hollows	The Project design will remove up to 15.46 ha of potential foraging habitat for south-eastern glossy black-cockatoo. Some maintenance vegetation clearing may be required during operation, to maintain tracks or access to certain areas and some clearing of regrowth vegetation may be required during decommissioning to facilitate plant and vehicle access. However, this will only be within the approved clearing footprint. Hollow bearing trees provide nesting habitat for south-eastern glossy black-cockatoo and there is potential that these will be impacted by clearing during the construction process. A total of 72.4 ha (108 trees) were modelled as potential breeding (nesting) habitat within the clearing footprint. However, no nest sites have been confirmed in these areas. Habitat clearing can increase the abundance of species with similar breeding place requirements, resulting in increased competition for hollows, (Glossy Black Conservancy, 2010). These species include common brush-tailed possum, galah, long-billed corella, little corella, sulphur-crested cockatoo and common myna, all of which were recorded on Project Site.	• Avoidance of remnant vegetation during the design phase – clearing in modelled south-eastern glossy black-cockatoo habitat has been minimised by design. • Micro-siting of infrastructure to avoid habitat during construction, including the avoidance of potential nest trees containing suitable hollows. • Rehabilitation of cleared areas upon decommissioning to encourage recruitment of a mix of locally appropriate feed tree species to ensure food resources are maintained in the longer term. • Fire management across the Project Site that encourages the recruitment of a mix of locally appropriate feed tree species to ensure food resources are maintained in the longer term. • Targeted surveys during the construction phase, including seasonal surveys to confirm use of foraging resources on-site and additional nesting hollow surveys to identify potential nesting sites within 500 m of proposed turbines. • Monitoring of any potential nests identified within 500 m of a turbine into the operational phase to identify any behavioural disturbance as a result of turbine operation and to allow appropriate actions under the Bird and Bat Management Plan (Ecosure, 2025a) (Appendix I) to be implemented.	Measures are considered effective at minimising the effects to south-eastern glossy black-cockatoo. Nevertheless, provision of offsets will be made under an Offset Area Management Plan to compensate for the full extent of the residual impact on the glossy black-cockatoo.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
		• Habitat augmentation (e.g. hollow relocation or replacement) may be implemented through the adaptive management plan were advised by a suitably qualified ecologist, to reduce impacts on the nesting sites of glossy black-cockatoos.	
Fragmentation of habitat	South-eastern glossy black-cockatoo is a highly mobile species, and the degree of fragmentation proposed within the Project Site will not impact the ability of this species to forage. The species will however benefit from any measures to reduce fragmentation as they will by default protect or enhance available habitats.	• Clearing within identified habitat areas has been minimised during the design phase of construction. • Utilisation of existing roads and tracks in Project design to reduce the creation of new barriers. • Rehabilitation of cleared areas upon decommissioning designed to encourage recruitment of a mix of locally appropriate feed tree species to ensure food resources are maintained in the longer term.	Measures are considered effective to manage the impacts of loss of connectivity.
Increased risk of predation	South-eastern glossy black-cockatoo eggs and young are predated by common brush-tailed possums and habitat clearing can increase the abundance of this species (Glossy Black Conservancy, 2010). Raptors that may be attracted by carrion below the RSA may also pose an additional risk to this species.	• Predator control if signs of increased predator numbers are observed during construction. • Waste management during construction and operation to ensure food wastes are secure and will not attract introduced species. • Implement actions detailed in a project specific pest animal management plan. • Monitoring of any potential nests identified within 500 m of any turbine into the operational phase will identify any impacts associated with increased predation and allow appropriate actions under the Bird and bat Management Plan (Ecosure, 2025a) (Appendix I) to be implemented.	Measures are considered effective to reduce the likelihood of the Project exacerbating predation by introduced predators.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Vehicle strike	Increased vehicle and plant use of the Project Site may increase risk of vehicle strike, particularly where tracks bisect remnant vegetation patches. Risk is likely to be highest during construction when traffic to and within the Project Site is high. Risk will continue throughout the operational phase of the Project (30 – 40 years), though vehicle use and therefore strike risk will be lower during the operational phase.	• Traffic management to minimise collisions during construction and operational phases. • Traffic management measures which will be implemented include limiting access routes, strict implementation of speed limits, and limiting night traffic.	Measures are considered effective to manage the risk of vehicle strike given the low risk this poses to the species given its flight behaviours.
Direct mortality from WTG strike	Impacts are possible during operation of the wind farm. While all sightings of south-eastern glossy black-cockatoo in flight within the Project Site observed the species flying at canopy height, this species is known to fly at the RSA height and was identified in the BBUS (Ecosure, 2025b) (Appendix J) as being of medium risk of collision with a turbine.	• RSA height maintained at no less than 65 m above ground height. • WTGs sited as far as practicable from remnant vegetation. • Adaptive monitoring and control program to be implemented in a Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).	Measures are considered effective to manage the risk of WTG strike given the recorded low level of site usage by this species.

4.6.4.1 Significant impact assessment

Table 4-9 EPBC Act significant impact assessment for vulnerable glossy black-cockatoo

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of an important population of a species	Unlikely. Important glossy black-cockatoo populations have not been identified on the Project Site. Construction will clear up to 15.46 ha of potential foraging (0.95% of available habitat within the Project Site) and an additional 72.4 ha (108 potential nesting trees) of modelled potential breeding (nesting) habitat (3.91% of available potential nesting habitat within the Project Site). Impacts to stands of preferred feed trees and nesting hollows will be managed by identification of areas during preclearing surveys and micro-siting of WTGs to avoid clearing these areas where possible. Operational impacts may include collision with WTG blades and behavioural disturbance in nesting/roosting habitat. The risk of collisions and behavioural disturbance will be minimised by siting WTGs as far away as practicable from remnant vegetation and watering points. Monitoring of collision mortality, in addition to nest site monitoring to determine any behavioural changes or disturbance, will allow implementation of adaptive management measures applied in accordance with a Bird and Bat Management Plan (Ecosure, 2025a) as required.
Reduce the area of occupancy of an important population	Unlikely. An important population of glossy black-cockatoo does not occur within the Project Site (refer to Table 4-4). An important population of glossy black-cockatoos is not considered to occur within the Project Site, due to: • It is not a key source population, as there are extensive areas of vegetation surrounding the Project Site which are likely to provide similar habitat values. There are records of this species and evidence of their activity has been recorded from areas adjacent the Project Site over several years (Golder Associates, 2018). • It is not required to maintain genetic diversity, as there are many records of the species within the wider region. Much of the vegetation within the Project Site is fragmented and isolated, which limits genetic exchange. • The Project Site is not at the limit of the species range. Clearing of up to 15.46 ha of foraging and an additional 72.4 ha (108 potential nesting trees) of modelled potential breeding habitat will not significantly reduce the area of occupancy in the broader region.
Fragment an existing important population into two or more populations	Unlikely. An important population of glossy black-cockatoo does not occur within the Project Site (refer to Table 4-4). The Project is unlikely to create barriers to movement or fragment populations of this highly mobile species.
Adversely affect habitat critical to the survival of a species	Likely. The Project will require clearing of 15.46 ha of potential foraging and 72.4 ha (108 potential nesting trees) of modelled potential breeding habitat. This represents only 0.95% of similar foraging and 3.91% of similar breeding (nesting) habitat available within the Project Site. There is also significant habitat immediately adjacent to the Project Site and surrounding landscape where known nesting locations occur (Golder Associates, 2018). Field-verified habitat modelled as potential foraging habitat, includes areas of remnant patches of vegetation communities, including REs 11.5.20, 11.11.4, 11.11.15, 11.12.3 and 11.12.6 known to contain *Allocasuarina* and *Casuarina* species within the understorey for foraging. The characteristics of nesting

Significant impact criteria	Assessment of the Project Site
	hollows required for breeding of this species is highly specific. No known glossy black-cockatoo nesting locations are identified within the Project Site, however, some large hollows have been recorded within remnant areas of the Project Site (although none identified to meet the criteria suitable for this species). Breeding habitat where potential nesting locations may occur across the Project Site, include areas modelled as within a suitable distance from known foraging (1 km from recorded foraging areas), water sources (200 m dam and 1.5 km from a watercourse) (Mooney and Pedler 2005) and only trees known to be >8 m (based on lidar height data, to gain trees suitable to house nests at or above 8 m) (Cameron 2006, Glossy Black Conservancy 2010) This species usually occurs in woodlands and it has been suggested they are seasonal migrants in south east Queensland, moving in response to seasonal availability of food resources and during breeding seasons (DCCEEW, 2022a). Preferred feed tree species vary by region and season, with the species displaying preference for individual feed trees and cones, despite the presence of suitable trees of the same species nearby (DCCEEW, 202a). The Project Site contains scattered patches of suitable feed trees primarily within the understorey of remnant vegetation, however, feeding signs “orts” have only been detected at some of these patches and primarily outside of the planning corridor. Impacts to stands of preferred feed trees and nesting hollows will be managed by identification of areas during preclearing surveys and micro-siting of WTGs to avoid clearing these areas where possible. Regardless the Project will remove up to 15.46 ha of foraging habitat considered critical to the survival of the species and 72.4 ha (108 potential nesting trees) of modelled potential breeding (nesting) habitat.
Disrupt the breeding cycle of an important population	Unlikely. An important population of glossy black-cockatoo does not occur within the Project Site (refer to Table 4-4). Preclearance surveys will be undertaken prior to the removal of vegetation to identify potential nesting hollows or valuable foraging areas. To mitigate any potential impacts to breeding cycles, it is recommended the removal of glossy black-cockatoo foraging and breeding habitat be scheduled outside of the breeding season (March – August), which is identified in a detailed Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I). Nest boxes are proposed to be installed for all hollows of suitable size and structure within the clearing footprint, that cannot be suitably avoided during micro siting. Nest boxes are to be installed at a ratio of 2:1 and must be suitable to house glossy black-cockatoos. The location of installed hollows will be placed nearby to those removed and/or within identified priority potential nesting locations of the proposed offset site. The Bird and Bat Management Plan (Ecosure 2025a) identifies targeted monitoring surveys for glossy black-cockatoo, to monitor wind farm operation and changes to glossy black-cockatoo behaviour, including avoidance of feeding habitat and avoidance of roosting and nesting trees. Monitoring will include targeted surveys for their feeding activity, completed at known feeding sites, particularly those in close proximity to WTGs, and nesting hollow searches within 500 m of each WTG. Prior to (during pre-clear surveys), during and post-construction (operation), potential nesting hollow searches will be completed and if any nesting resources are identified, surveys will be completed to determine if nesting activity is occurring/has occurred, for further monitoring during breeding season, or if signs of abandonment are present. If abandonment or avoidance is detected adaptive management measures will be implemented. A small area of up to 72.4 ha of modelled potential breeding habitat, which

Significant impact criteria	Assessment of the Project Site
	based on lidar data contains up to 108 potential nesting trees, will be impacted by the proposed project. However, provided the avoidance, monitoring and adaptive management is implemented the Project is unlikely to significantly disrupt the breeding cycle of an important population of glossy black-cockatoo.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. The Project will require clearing of 15.46 ha of potential foraging (0.95% of available habitat within the Project Site) and an additional 72.4 ha (108 potential nesting trees) of modelled potential breeding habitat (3.91% of available potential breeding habitat within the Project Site). The Project Site contains scattered patches of suitable feed trees primarily within the understorey of remnant vegetation, however, feeding signs “orts” have only been detected at some of these patches and primarily outside of the planning corridor. Given the amount of habitat remaining within the wider locality (including known foraging areas adjacent to the Project Site), the scattered nature of the available foraging habitat within the impact area, the proposed clearing is unlikely to decrease the availability or quality of the habitat to the extent the species’ population will decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species’ habitat	Unlikely. No invasive species are known to threaten the glossy black-cockatoo. However, invasive weeds can alter the characteristics of habitat, thereby changing foraging and nesting resource availability and some weeds may increase the flammability of the habitat, amplifying wildfire risks. The proposed Project will implement appropriate weed management in accordance with the Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) for the areas within and adjacent to the clearing footprint, therefore it is unlikely to result in the establishment of an invasive species that could harm glossy black-cockatoos or their habitat.
Introduce disease that may cause the species to decline	Unlikely. Glossy black-cockatoos are not threatened by any known disease that could be brought into the species habitat by the Project.
Interfere substantially with the recovery of the species.	Unlikely. The Project Site contains vegetation which provides foraging and nesting habitat for glossy black-cockatoo. Some habitat is proposed to be cleared, however, given the availability of large tracts of vegetation within and adjacent to the Project Site that will remain, it is unlikely that construction of this Project will significantly impact the species.
Overall impact assessment	The proposed Project is unlikely to have a significant impact on glossy black-cockatoo, with the implementation of all practical impact mitigation measures.

Although the overall assessment was determined to be unlikely to result in a significant impact on the glossy black-cockatoo, the Proponent is committed to an offset (land-based or financial) in agreement with DCCEEW for impact to the glossy black-cockatoo foraging habitat and nesting locations in breeding habitat. The proposed offset would be collocated with the offset for residual significant impacts to koala and greater glider as detailed in the OMS and to be developed in an OAMP. However, given the low site observations of the species across the Project Site, successful detection of the species on the offset site identified in the OAMP may be difficult and should focus on signs of suitable foraging (‘ort’ searches). Species presence on the offset site should not be considered a defining factor of offset success.

4.6.5 Impacts to Austral toadflax

A formal impact assessment for the Austral toadflax listed as vulnerable under the EPBC Act is provided in Table 4-10.

The Project may clear up to 11.68 ha of potential habitat associated with riparian areas, which represents 1.18% of available habitat within the Project Site. An important focus of ongoing Project refinement has been to avoid riparian areas where possible, and the current design has substantially reduced proposed clearing of riparian areas. Additional surveys within the planning corridor targeting this species were completed in 2025, and no populations or suitable habitat to support this species was detected within these areas. Pre-clearing surveys and micro-siting of Project infrastructure in or near riparian areas will assist in the avoidance and minimisation of any impacts to areas where populations of toadflax or kangaroo grass are detected in the future, however this is unlikely in the current planning corridor, given the poor condition of this habitat. Provided that these measures are successfully implemented, along with those listed in the Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) to manage weeds, it is unlikely that the proposed infrastructure will result in a significant impact to the species.

4.6.5.1 Significant Impact Assessment

Table 4-10 EPBC Act significant impact assessment for vulnerable Austral toadflax

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of an important population of a species	Unlikely. An important population of Austral toadflax is not known to not occur within the Project Site. No individuals were detected during surveys, although two records are known from a riparian area approximately 1 km west of the Project Site.
Reduce the area of occupancy of an important population	Unlikely. An important population of Austral toadflax is not known to not occur within the Project Site. The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only 1.18% of available habitat within the Project Site. Project refinements have substantially reduced proposed clearing of riparian habitat within the Project Site. Ongoing micro-siting of infrastructure will further reduce proposed clearing of potential habitat.
Fragment an existing important population into two or more populations	Unlikely. An important population of Austral toadflax is not known to occur within the Project Site. Watercourse crossings for the proposed Project may cause minor fragmentation along riparian corridors. Clearing at crossing points will be minimised as far as possible and is unlikely to result in significant barriers to pollination and seed dispersal. Proposed riparian clearing is also unlikely to impact on host grass species (e.g. kangaroo grass).
Adversely affect habitat critical to the survival of a species	Unlikely. There is no advice relating to what habitat is considered habitat critical to the survival of the species. Surveys within suitable habitat did not detect this species, with the nearest known records about 1 km west of the Project Site. Current negative survey results suggest that the Project Site does not contain critical habitat for this species.
Disrupt the breeding cycle of an important population	Unlikely. An important population of Austral toadflax is not known to occur within the Project Site. The reproductive ecology of Austral toadflax is unknown, but related species are thought to be pollinated by small bees and flies, and seeds may be dispersed by gravity, water and ants (USDA, 2019). The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only 1.18% of available habitat within the Project Site. This level of clearing is unlikely to result in significant impacts to pollination or seed dispersal.

Significant impact criteria	Assessment of the Project Site
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. Surveys within suitable habitat did not detect this species, with the nearest known records about 1 km west of the Project Site. Current negative survey results suggest that the Project Site does not contain critical habitat for this species. The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only 1.18% of available habitat within the Project Site. Ongoing micro-siting of infrastructure will further reduce proposed clearing of potential habitat. Other potential impacts on habitat quality could include weed invasion, increased grazing pressure, changed fire regimes and riparian erosion. Measures to minimise impacts to habitat quality will include weed and pest animal management and erosion and sediment control.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely. Austral toadflax and its host grass species may be heavily grazed by domestic stock such as cattle and horses, and some feral herbivores such as rabbits (Scarlett, Branwell and Earl, 2003). Given the current land use (e.g. grazing) these impacts are already present and the Project is unlikely to exacerbate the impact. Riparian weeds may also outcompete and smother Austral toadflax and its host grass species. An Environmental Management Plan, along with a Vegetation Management Plan (Ecosure, 2025e) and Fauna Management Plan (Ecosure, 2025c) have been developed to manage weed and pest animal management (refer Appendices G, H and M). This will include appropriate weed hygiene measures and treatment of weeds prior to and during construction.
Introduce disease that may cause the species to decline	Unlikely. Austral toadflax is not known to be susceptible to any diseases that may cause the species to decline.
Interfere substantially with the recovery of the species.	Unlikely. The Project may remove up to 11.68 ha of potential riparian habitat, but this represents only 1.18% of available habitat within the Project Site. If further surveys detect a population of this species, it is likely that micro-siting of infrastructure would be able to avoid the population. The small amount of proposed clearing is unlikely to be substantial enough to interfere with the recovery of the species.
Overall impact assessment	The proposed Project is unlikely to have a significant impact on Austral toadflax, with the implementation of all practical impact mitigation measures.

4.6.6 Impacts to wandering peppercress

A formal impact assessment for wandering peppercress listed as endangered under the EPBC Act is provided in Table 4-11. Wandering peppercress was identified as possibly occurring within the Project Site in the MNES assessment (refer Appendix E). Suitable habitat for this species is present and there are multiple records 20 km to the south of the Project Site. A precautionary approach has been adopted and likelihood of this species occurring has been assessed as Possible and a significant impact assessment completed.

The Project may clear up to 11.68 ha of potential habitat associated with riparian areas, which represents 1.18% of available habitat within the Project Site. An important focus of ongoing Project refinement has been to avoid riparian areas where possible, and the current design has substantially reduced proposed clearing of riparian areas Additional surveys within the planning corridor targeting this species were completed in 2025, and no populations or suitable habitat to support this species was detected within these areas. Pre-clearing surveys and micro-siting of Project infrastructure in or near riparian areas will assist in the avoidance and minimisation of any impacts to areas where populations of wandering peppercress are detected in the future, however this is unlikely in the current planning

corridor, given the poor condition of this habitat. Provided that these measures are successfully implemented, it is unlikely that the proposed infrastructure will result in a significant impact to the species.

4.6.6.1 Significant Impact Assessment

Table 4-11 EPBC Act significant impact assessment for endangered wandering peppercress

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of a population	Unlikely. No individuals were detected during surveys, and the nearest known records are about 20 km to the south in the Bunya Mountains. Based on current desktop and field results, it is only possible that a population exists within the proposed development area. Nevertheless, further targeted surveys will be required if clearing is proposed in riparian areas outside of the current planning corridor to search for any potential populations. The corridor contains sufficient buffers, so that any detected individuals could likely be avoided by micro-siting of infrastructure.
Reduce the area of occupancy of the species	Unlikely. No individuals were detected during surveys, and the nearest known records are about 20 km to the south. Based on current desktop and field results, it is unlikely but taking into account the precautionary principle is considered to be possible that a population exists within the proposed clearing footprint. The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only 1.18% of available habitat within the Project Site. Project refinements have substantially reduced proposed clearing of riparian habitat within the Project Site. Ongoing micro-siting of infrastructure will further reduce proposed clearing of potential habitat.
Fragment an existing population into two or more populations	Unlikely. Watercourse crossings for the proposed Project may cause minor fragmentation along riparian corridors. Clearing at crossing points will be minimised as far as possible and is unlikely to result in significant barriers to pollination and seed dispersal.
Adversely affect habitat critical to the survival of a species	Unlikely. There is no advice relating to what habitat is considered habitat critical to the survival of the species. Surveys within suitable habitat did not detect this species, with the nearest known records about 20 km to the south in very different montane habitat in the Bunya Mountains. Current negative survey results suggest that the Project Site does not contain critical habitat for this species.
Disrupt the breeding cycle of a population	Unlikely. Seeds have a mucilaginous coat so are likely to be dispersed by attaching to feathers and fur of passing animals (Heenan and de Lange, 2011). This is supported by records of introduction into New Zealand and Europe on sheep fleeces. Pollinators are unknown, but related species are pollinated by bees and other insects (Robertson and Klemash, 2003), The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only 1.18% of available habitat within the Project Site. This level of clearing is unlikely to result in significant impacts to pollination or seed dispersal.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to	Unlikely. No individuals were detected during surveys, and the nearest known records are about 20 km to the south. Current negative survey results suggest that the Project Site does not contain critical habitat for this species. The proposed Project will remove up to 11.68 ha of potential riparian habitat, which is only

Significant impact criteria	Assessment of the Project Site
decline	1.18% of available habitat within the Project Site. Ongoing micro-siting of infrastructure will further reduce proposed clearing of potential habitat. Other potential impacts on habitat quality could include weed invasion, increased grazing pressure and riparian erosion (DoE, 2014a). Measures to minimise impacts to habitat quality will include weed and pest animal management and erosion and sediment control.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely. Wandering peppercress may be grazed by domestic stock such as cattle and horses, and some feral herbivores such as rabbits (DoE, 2014a). Given the current land use (e.g. grazing) these impacts are already present, and the Project is unlikely to exacerbate the impact. Riparian weeds may also outcompete and smother this species. A Construction Environmental Management Plan along with a Vegetation Management Plan (Ecosure, 2025e) and Fauna Management Plan (Ecosure, 2025c) have been developed to manage weed and pest animal management (refer Appendix G, Appendix H and Appendix M). This will include appropriate weed hygiene measures and treatment of weeds prior to and during construction.
Introduce disease that may cause the species to decline	Unlikely. Wandering peppercress is not known to be susceptible to any diseases that may cause the species to decline.
Interfere with the recovery of the species.	Unlikely. The Project may remove up to 11.68 ha of potential riparian habitat, but this represents only 1.18% of available habitat within the Project Site. If further surveys detect a population of this species, it is likely that micro-siting of infrastructure would be able to avoid the population. The small amount of proposed clearing is unlikely to be substantial enough to interfere with the recovery of the species.
Overall impact assessment	The proposed Project is unlikely to have a significant impact on wandering peppercress, with the implementation of all practical impact mitigation measures.

Based on the outcome of the SIA results, it is considered unlikely that the Project will have significant impacts on EPBC Act listed flora species.

4.6.7 Impacts to yellow-bellied glider

Habitat mapping was completed for the yellow-bellied glider identifying the Project Site provides up to 9,841.58 ha of potential dispersal habitat for the species. There is 270.12 ha of dispersal habitat within the clearing footprint, which includes 15.46 ha of remnant and HVR vegetation and 254.66 ha of non-remnant and regrowth vegetation. Given the species' requirements for large areas of old growth forest, exclusive home ranges, along with a limited ability to traverse through fragmented landscapes (such as moving from areas of known occupancy to the Project Site) and that the species is unlikely to persist in small patches of habitat, the Project Site does not provide breeding habitat or foraging habitat suitable to permanently support this species. The habitat although contains some denning and suitable foraging trees, is marginal for this species and is likely to only support the species in a limited dispersal function. There are no records of the species occurring within the Project Site, either historically (DETSI, 2025) or across the Project's surveys between 2018 – 2025. Additionally, no signs of feeding scars were observed during surveys, including targeted species surveys between 2018 – 2025.

The yellow-bellied glider is listed as vulnerable, which requires a determination of an important population. There are no known important populations within the Project Site or broader South Burnett region (nearest being Carnarvon Range to the north, which occurs approximately 400 km north west of the Project Site).

Other populations important to the survival of the yellow-bellied glider (south-eastern) include:

- stronghold populations
- ecologically or genetically distinct populations (e.g., those at the limits of the subspecies' range, outlying populations)
- research populations
- other populations where recovery actions are being implemented.

There has been no record of a population occurring within the Project Site, the Project Site is not at the limit of the subspecies range, there is no research population present on the Project Site and the Project Site land management is consistent with active grazing properties. There is no proposed change to the land use or management practices (including maintaining cleared grazing areas and selective removal of timber resources from non-remnant areas) by landowners during the life of the Project (minimum 30 years) and as such the Project Site does not consist of a population where recovery actions are proposed to be implemented or that would provide refuge areas for future use of the subspecies or increase the suitability of the site as potential habitat.

Tracks will cause some fragmentation, however mitigation measures and landscape connectivity has been maintained (refer to Section 4.6.9.1), also yellow-bellied gliders are known to be able to traverse gaps 75 m to 100 m in width (Van Dyck and Strahan, 2008). In addition to the impacts of habitat loss, fragmentation of remnant habitat patches by clearing areas greater than the glide distance (based on a glide ratio of 2.0 and 1.6 and tree height for the Project Site) may force gliders to traverse across the ground increasing their susceptibility to predation (Taylor and Goldingay, 2014).

The clearing footprint avoids most large blocks of potential habitat for yellow-bellied glider and generally maintains quite narrow access tracks (<50 m). However, one unavoidable site on Jumma Road where the installation of electrical overhead line infrastructure parallel to the existing road will create a wider than usual corridor, varying between 35 m to 120 m wide within potential dispersal habitat for yellow-bellied glider. The works at this locality have been designed to reduce impacts as much as possible, including incorporation of two residual patches of vegetation, approximately 20 – 30 m wide and 200 – 300 m long, to facilitate yellow-bellied glider movement across Jumma Road (refer Part A2 Figure 3-16). Additionally, installation of fauna crossing infrastructure (e.g., glider poles) will assist in areas where the clearing footprint is greater than the maximum glide distance for the gliders, such as within the overhead line corridor. The design of the glide pole and spacing will be completed during detailed design and take into consideration engineering, safety and ecological requirements as directed by suitably qualified experts in these areas, any/all relevant guidelines, and in agreement with DCCEEW.

Pre-clearing surveys will be undertaken to inform, where possible, micro-siting of Project infrastructure within the clearing footprint that minimises loss of tree hollows, clearing and fragmentation of habitat.

Operational activities are unlikely to directly impact significantly on yellow-bellied gliders.

The impacts to the yellow-bellied glider, the likely duration and extent of those impacts, and the avoidance, minimisation, and mitigation measures applied to reduce the impact are detailed in Table 4-12. An assessment of impacts on yellow-bellied glider is provided in Table 4-13.

Table 4-12 Impacts and mitigation measures for the vulnerable yellow-bellied glider

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Habitat loss and loss of denning hollows	The Project design will remove up to 270.12 ha of potential dispersal habitat during the construction phase of the Project.	• Clearing in modelled yellow-bellied glider habitat has been minimised by design. In particular, large areas of remnant vegetation were excluded from the Project clearing footprint. • Micro-siting of infrastructure within the clearing footprint to avoid hollow bearing trees, wherever possible during construction. • Rehabilitation of cleared areas upon decommissioning. • Replacement of suitable denning hollows which are unavoidably cleared at a rate of two nest boxes for every one hollow removed.	Measures considered effective at managing the effects to yellow-bellied glider
Fragmentation of habitat	Clearing of vegetation for tracks and infrastructure may increase distances between habitat patches, reducing the ability of yellow-bellied gliders to traverse those distances and resulting in isolation of populations. This impact will occur at construction and throughout the operational life of the wind farm (30 – 40 years). The Project Site landscape is already highly fragmented from previous clearing and land us activities, as such the greatest impact of fragmentation will occur in a patch of remnant vegetation and modelled yellow-bellied glider potential dispersal habitat along Jumma Road, which will be widened in places up to 120 m.	• Utilisation of existing roads and tracks in Project design to avoid adding new points of fragmentation in the landscape. • Rehabilitation of cleared areas upon decommissioning to minimise distances between habitat patches. • Retention of existing trees / habitat patches between adjacent access tracks where possible to act as stepping stone habitat. • Installation of glider poles suitable for yellow-bellied glider use in areas where the clearing footprint is greater than the maximum glide distance (based on a 1.6 – 2.0 glide ratio) at strategic locations along the clearing footprint and within areas of modelled glider habitat. • Design of the glide pole and spacing will be completed during detailed design and take into consideration engineering, safety and ecological requirements as directed by suitably qualified experts in these areas, any/all relevant guidelines, and in agreement with DCCEEW.	Measures are considered effective to manage the impacts of loss of connectivity.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Increased risk of predation	Risk is likely to be highest during construction when high numbers of personnel are present and habitat disturbance is occurring. Habitat clearing may create habitat gaps large enough to cause yellow-bellied gliders to use the ground to cross cleared areas, which increases risk of predation by European foxes, feral cats, or wild dogs.	• Predator control if signs of yellow-bellied glider predation or increased predator numbers are observed during construction. • Waste management during construction and operation to ensure food wastes are secure and will not attract introduced predators. • Implement actions detailed in a project specific pest animal management plan.	Measures are considered effective to reduce the likelihood of the Project exacerbating predation by introduced predators.
Vehicle strike	Increased vehicle and plant use of the Project Site may increase risk of vehicle strike, particularly where tracks bisect remnant vegetation patches. Risk is likely to be highest during construction when traffic to and within the Project Site is high. Risk will continue throughout the operational phase of the Project (30 – 40 years), though vehicle use and therefore strike risk will be lower during the operational phase.	• Traffic management to minimise collisions during construction and operational phases. • Traffic management measures which will be implemented include limiting access routes, strict implementation of speed limits, and limiting night traffic.	Measures are considered effective to manage the risk of vehicle strike.
Disruption to breeding	Risk is likely to be low for yellow-bellied gliders, as the site is not considered to contain a breeding population of the subspecies. However, the highest risk to any potential impacts would be during construction if yellow-bellied gliders are dispersing through the Project Site and habitat disturbance is occurring.	• Active nocturnal spotlighting searches for yellow-bellied gliders during pre-clearance surveys for signs of denning prior to clearing works each day. • Clearing will avoid areas of yellow-bellied glider habitat during March to June where the construction schedule allows. • If a tree in which a yellow-bellied glider is suspected to be denning is identified for clearing, the tree shall be inspected for the presence of denning individuals prior to clearing. • Safe clearing practices, including inspection of confirmed or suspected dens, gentle tree removal (using soft fall and vertical tree grabs)	Measures are considered effective to manage the risk of breeding disruption.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
		for any trees with hollows, and leaving trees in situ where sheltering or breeding confirmed to allow self-relocation. • Replacement of suitable denning hollows which are unavoidably cleared at a rate of two nest boxes for every one hollow removed.	

4.6.7.1 Significant impact assessment

Table 4-13 EPBC Act significant impact assessment for vulnerable yellow-bellied glider

Significant impact criteria	Assessment of the site
Lead to a long-term decrease in the size of an important population of a species	Unlikely. There was no population of yellow-bellied glider recorded during surveys between 2018 – 2025 on the Project Site and there is no important population recorded within the Project Site or adjacent areas. The site provides potential dispersal habitat for populations historically recorded in surrounding state forests. The available dispersal habitat could be reduced by loss or degradation of habitat, and the dispersing individuals impacted by direct injury/mortality and increased predation if occurring on the Project Site. The Project will require clearing of up to 15.46 ha of remnant dispersal habitat and 254.66 ha of non-remnant dispersal habitat. Approximately, 2.75% of the total available dispersal habitat (9,841.58 ha) on the Project Site will remain unimpacted and be retained to maintain dispersal habitat resources for yellow-bellied glider if they utilise the Project Site in the future. As the Project design has progressed the Project footprint has been reduced and to limit impacts to areas of high glider observations (greater gliders, and squirrel and sugar gliders) from the clearing footprint, this will minimise the potential impacts to yellow-bellied glider dispersal habitat. Impacts to habitat will be reduced by ongoing infrastructure layout refinement and WTG micro-siting to reduce clearing. Measures to minimise injury/mortality will include pre-clear surveys, sequential clearing and use of fauna spotter-catchers to identify and allow gliders to self-relocate during construction or be relocated (if required), traffic management to minimise collisions (i.e. reduced speed limits to <40 km per hour), minimise track widths, install and monitor permanent fauna movement infrastructure (e.g. glider poles), retain adjacent tall trees alongside tracks, undertake pest management and install temporary exclusion fencing during the construction phase in areas of mapped glider habitat. There are studies to show glide poles have been successfully used repeatedly by active species such as yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (B. D. Taylor & Rohweder, 2020). Installation and monitoring of glide poles in the rural environment of the Project Site to facilitate the crossing of the Jumma Road corridor (varies between 35 m – 120 m wide sections) will be completed to facilitate movement across the Jumma Road remnant habitat. Additionally, the Project design has maintained two patches of remnant vegetation within the clearing footprint (approximately 20 - 30 m wide and 200 – 300 m long), as shown in Part A2, Figure 3-16. These patches will provide gliding and resting opportunities for gliders traversing this section of Jumma Road. Provided these measures are successfully implemented, the Project is unlikely to lead to a long term decrease in the size of the local population.
Reduce the area of occupancy of an important population	Unlikely. The Project will require clearing of up to 270.12 ha of yellow-bellied glider dispersal habitat, which represents only 2.75% of the available dispersal habitat within the Project Site. No records of yellow-bellied glider occur in the Project Site and historical records occur in large patches of habitat in the broader region (Part A2, Figure 3-13), with only one tract of vegetation (Diamondy State Forest) containing the species within 20 km from the Project Site. The area of habitat available for occupation by yellow-bellied glider across the Project Site will not be significantly reduced by the proposed Project. The Project will not displace yellow-bellied gliders from the Project Site and will therefore not reduce the area of occupancy of the local population.

Significant impact criteria	Assessment of the site
Fragment an existing important population into two or more populations	Unlikely. Fragmentation of glider habitat through the construction of access tracks and other infrastructure may result in gliders moving across the ground making them more vulnerable to vehicle collisions and predators such as wild dogs. The planning corridor avoids most contiguous blocks of habitat for gliders, which generally occurs in the hilltop remnant vegetation. Clearing for the upgrade of one section of Jumma Road will increase fragmentation of one habitat patch known to support greater glider (no records of yellow-bellied glider were observed during the surveys between 2018 -2025). Clearing in this section will be minimised as far as possible. To facilitate movement across the Jumma Road remnant habitat the Project design has maintained two patches of remnant vegetation within the clearing footprint (approximately 20 – 30 m wide and 200 – 300 m long). In other strategic locations across the Project Site and clearing footprint, where detailed design for the track, drainage and corridor for electrical reticulation will clear spans wider than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6), mitigation measures such as glide poles will be installed at key points to avoid gliders having to traverse the ground. Glide poles and maintaining narrowed sections of clearing with adjacent tall tree retention, along with strict traffic management procedures (e.g. limited access routes, speed controls, limited night traffic with reduced speeds at <40 km/hr) will further reduce potential impacts of access tracks on habitat fragmentation, along with pest animal management during operation phases of the Project. There are studies to show glide poles have been successful with repeated use by yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (B. D. Taylor & Rohweder, 2020). Glide poles will be designed and engineered during the detailed design phase with input from suitably qualified ecologist and implemented as part of the Fauna Management Plan for the Project. Assuming these mitigation measures are implemented the Project is unlikely to have a residual impact of fragmentation on the limited potential dispersal habitat for this species on the Project Site.
Adversely affect habitat critical to the survival of a species	Unlikely. The Project Site does not contain habitat considered critical to the survival of the species, such as large contiguous areas of old growth forest containing suitable food and den trees. Habitat modelling shows the Project Site contains some dispersal habitat for the species, which offers some foraging and denning resources to support dispersal. There are no sighting records of yellow-bellied glider across the Project Site and all historical records occur in large contiguous patches with limited connection to the Project Site. The proposed project will remove 270.12 ha of potential dispersal habitat, which is 2.75% of the mapped potential dispersal habitat within the Project Site. While proposed mitigation measures (ongoing refinement and micro-siting of infrastructure, weed and pest animal management, rehabilitation) will further reduce direct and indirect impacts on this habitat, the combined removal of up to 270.12 ha of dispersal habitat for the yellow-bellied glider is unlikely to have an adverse impact.
Disrupt the breeding cycle of an important population	Unlikely. Breeding habitat for the yellow-bellied glider is not mapped on the Project Site and is considered to occur in large contiguous patches of habitat in the broader region (refer Part A2, Figure 3-13). Although highly unlikely, given the available habitat and the competition for denning resources with greater glider, which have evidence of populations occupying the site, mitigation measures including strict traffic and construction management procedures (e.g. limited access routes into Preferred habitat areas, speed controls on all internal tracks <40 km/hr and limiting activities to daylight use as far as possible) will minimise impacts on nocturnal species such

Significant impact criteria	Assessment of the site
	as the yellow-bellied glider. Additionally, installation of nest boxes for all hollows unavoidably removed, may assist in mitigating impacts of the loss of any denning or breeding hollows. The proposed level of clearing and ongoing disturbance is unlikely to disrupt the breeding cycle of yellow-bellied glider.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. The loss of 270.12 ha of mapped dispersal habitat is unlikely to decrease the availability or quality of habitat within the Project Site to the extent the species will decline. The proposed clearing will be restricted to WTG pads, access tracks and associated infrastructure, which will not result in large areas of habitat loss. Where possible, hollow-bearing trees will be avoided by micro-siting of infrastructure guided by pre-clearing surveys. The Project Site land management is consistent with active grazing properties. There is no proposed change to the land use or management practices (including maintaining cleared grazing areas and selective removal of timber resources from non-remnant areas) during the life of the Project (minimum 30 years) and as such the Project Site is unlikely to provide refuge areas for future use of the subspecies. Clearing of potential dispersal habitat in the form of linear clearance to access WTG pads and other infrastructure, is not considered likely to decrease the availability or quality of habitat available for yellow-bellied glider to the extent that the species will decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely. Yellow-bellied gliders are known to be taken by foxes (DAWE, 2022c), and these predators were observed at the Project Site during field surveys. The Project is unlikely to result in an invasive fauna species becoming further established in the species' dispersal habitat. However, the Project may increase population levels of introduced predators during the operation phase, through an increase in available food resources (e.g. carcasses from turbine strike). The implementation of a pest animal management plan, including carcass monitoring and removal, will manage predator populations to avoid impacts to the yellow-bellied glider population. A pest animal management plan will be developed and implemented prior to operation, detailing the ongoing pest animal management during wind farm operation. Additionally, installation of fauna movement infrastructure (e.g. glide poles) on tracks wider than the maximum glide distance through known glider habitat will limit the need for gliders to traverse the ground, where they are at higher risk of predation. Some invasive weeds can increase the flammability of the habitat, amplifying wildfire risks. The proposed Project will implement appropriate weed management in accordance with a Vegetation Management Plan for the areas within and adjacent to the clearing footprint, therefore is unlikely to result in the establishment of an invasive weed species that could impact glider habitat.
Introduce disease that may cause the species to decline	Unlikely. Yellow-bellied gliders are not threatened by any disease that could be brought into the species' habitat by the Project.
Interfere substantially with the recovery of the species.	Unlikely. The small amount of proposed clearing of mapped dispersal habitat is unlikely to exacerbate the existing extent and degree of fragmentation across the entirety of the Project Site, other than a 1 km section of Jumma Road (Part A2, Figure 3-16). However, the clearing may also slightly reduce the availability of large hollows which provide limited denning opportunities during dispersal for yellow-bellied glider across the Project Site. The area of dispersal habitat to be impacted is 15.46 ha remnant areas or 0.95% of the 1,631.71 ha mapped remnant dispersal habitat, and 254.66 ha of non-remnant areas which represents 3.1% of the 8,209.87 ha of non-remnant dispersal habitat. The majority of impacts are to non-remnant habitat areas where trees are not yet of sufficient size to offer large hollows for denning.

Significant impact criteria	Assessment of the site
	Protecting and retaining hollow-bearing trees is an important recovery action for the yellow-bellied glider. Pre-clearing surveys will allow micro-siting of Project infrastructure to minimise the loss of tree hollows, along with the minimising of clearing widths and fragmentation of habitat and identifying key trees adjacent to tracks to be maintained, will help to avoid any significant impact on species recovery. A Bushfire Management Plan (LEC, 2024) has been developed for the Project and will be implemented to mitigate inappropriate fire regimes (such as high frequency or intensity fires) as a result of the Project's actions. 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, to minimise the risk of glider entanglement. Pest animal management in accordance with a project specific pest animal management plan will be undertaken during the operational life of the Project, alongside carcass monitoring, in order to manage predator populations and avoid impacts to the yellow-bellied glider population that could possibly occur within the Project Site.
Overall impact assessment	The proposed Project is unlikely to have a significant impact on yellow-bellied glider, assuming all practical impact mitigation measures are applied.

4.6.8 Impacts to koala

The koala was upgraded in 2022 from vulnerable to endangered under the EPBC Act. Between 2018 and 2023, surveys detected 16 koala sightings (13 within and 3 adjacent to the Project Site) and a further 21 koala signs (koala scats and scratches) in vegetation containing Queensland blue gum (RE 11.3.25) and narrow-leaved ironbark (REs 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6). The 2022 review of koala habitat identified LIKT (species that are regularly browsed by koalas) and AKHT (species that provide shelter or other resources) within bioregions (Youngentob, Marsh and Skewes, 2021). Surveys recorded six species that are LIKT in the Brigalow Belt bioregion and five species that are AKHT (Table 3-8).

The current Project design will remove up to 270.52 ha of mapped koala habitat (15.46 ha of Preferred habitat in remnant vegetation, and 115.2 ha of modelled General habitat and 139.86 ha of General low quality habitat within non-remnant areas). Additionally, the Project includes clearing of up to 347.16 ha of modelled koala Dispersal habitat within non-remnant areas (Part A2 Figure 3-15).

Impacts to koala from the Project construction phase clearing that could reduce habitat availability and connectivity, increase risk of predation from terrestrial predators such as dogs and exacerbate stress-induced disease, include the clearing of Preferred and General koala habitat considered critical to the survival of the species. Operational activities may increase the risk of vehicle strike, especially vehicle movements when koalas are most active (e.g. at night and in the lead up to the breeding season from July to September). The impacts to koala, the likely duration and extent of those impacts, and the avoidance, minimisation, and mitigation measures applied to reduce the impact are detailed in Table 4-14. An assessment of impacts on koala is provided in Table 4-15.

When considering areas of koala Dispersal habitat, such as open spaces and grasslands with scattered trees, the habitat quality lies in the facility of the land for koalas (Dr Bill Ellis, pers comm, April 2024). While this is an additional clearing of koala habitat, due to the linear nature of the infrastructure generally proposed in these areas, it is considered to maintain safe koala dispersal between areas of Preferred and General habitat (including low quality) and will not interfere long term with the provision of ecological function of the Dispersal habitat.

For open spaces that are used by koalas for travel and to access landscape features critical to survival (particularly Preferred and General habitat), the impact will only last for as long as this facility is removed. Balanced against security of habitat and long-term management of feral pests, the management of koala movement and dispersal habitat may improve at sites where good management follows from an approved action (Dr Bill Ellis, pers comm, April 2024). Additional management measures such as no fencing of access tracks, fire management, and traffic management including low

speed (<40 km/hr) internal maintenance access tracks, will ensure the facility of the Dispersal habitat will remain post construction.

While this is an additional clearing of a small number of paddock trees within the Dispersal habitat, due to the linear nature and narrow clearing widths of tracks (generally less than <40 m), safe koala movement and dispersal opportunities will be maintained within the Dispersal habitat and will not interfere with the ecological function of the Dispersal habitat. As such the clearing actions within the Dispersal habitat are not considered to contribute to a significant impact for koala.

Table 4-14 Impacts and mitigation measures for the endangered koala

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Habitat loss	The Project design will remove koala habitat for foraging, breeding, and dispersal during the construction phase. This consists of 15.46 ha of remnant vegetation (Preferred habitat), 115.2 ha of habitat within non-remnant woodland vegetation (General habitat) and 139.86 ha of habitat within non-remnant woodland vegetation (General low quality habitat), and 347.16 ha of non-remnant Dispersal habitat. This scale of clearing will occur only during construction. Some maintenance vegetation clearing may be required during operation, to maintain tracks or access to certain areas and some clearing of regrowth vegetation may be required during decommissioning to facilitate plant and vehicle access. However, this will only be within the approved clearing footprint.	• Avoidance of koala Preferred and General habitat during the design phase – clearing in remnant and modelled (non-remnant woodland areas) koala habitat has been minimised by design. • Micro-siting of infrastructure to avoid habitat during construction. • Rehabilitation of cleared areas upon decommissioning.	Measures considered effective at minimising the effects to koala, however residual impact after avoidance, mitigation, and minimisation considered to be significant. Provision of offsets will be made under an Offset Area Management Plan, to compensate for loss of koala habitat and to enhance landscape-scale connectivity.
Loss of connectivity	Clearing of vegetation for tracks and infrastructure may increase distances between Preferred and General habitat patches, reducing the ability of koalas to travel safely between habitat patches. The effects of increased fragmentation will occur throughout construction and the operational life of the wind farm (30 – 40 years).	• Clearing within riparian areas minimised during design phase of construction. • Utilisation of existing roads and tracks in Project design. • Rehabilitation of cleared areas upon decommissioning. • Restricted fencing to around key infrastructure (e.g. substations, site compounds and battery energy storage system areas), no fencing of access tracks.	Measures are considered effective to manage the impacts of loss of connectivity.
Increased predation risk by wild dogs	Risk is likely to be highest during construction when high numbers of personnel are present and habitat disturbance is occurring. Habitat clearing may cause increased koala movement across the ground, which increases risk of predation by wild dogs. Wild dogs are known to be present in the landscape, which is broadly agricultural.	• Predator control if signs of koala predation or increased predator numbers are observed during construction. • Waste management during construction and operation to ensure food wastes are secure and will not attract wild dogs. • Implement actions detailed in a project specific pest animal management plan.	Measures are considered effective to reduce the likelihood of the Project exacerbating predation by wild dogs.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Stress-induced disease exacerbation	Clearing of habitat and behavioural disturbance particularly during construction may cause stress and increase susceptibility of koalas to diseases such as koala chlamydia and koala retrovirus. Risk will be most acute during construction, when interactions between construction crew and machinery, and koalas will be most common. Not likely to continue during the operational phase of the Project.	• Clearing of modelled koala habitat avoided where possible during the design phase (e.g. excluding large contiguous remnant areas from the Project Site, siting WTGs in cleared areas). • Sequential clearing of modelled koala habitat to allow koalas present to move out of the construction area. • Retention of any tree in which a koala is present until it has self-relocated.	Measures are considered effective to manage the risk of stress-induced disease.
Vehicle strike	Increased vehicle and plant use of the Project Site will increase the risk of direct mortality by vehicle strike. Risk is likely to be highest during construction when traffic to and within the Project Site is high. Risk will continue throughout the operational phase of the Project (30 – 40 years), though vehicle use and therefore strike risk will be lower during the operational phase.	• Traffic management to minimise collisions during construction and operational phases, particularly during koala breeding season when individuals are more mobile. • Traffic management measures which will be implemented include limiting access routes, strict implementation of speed limits, and limiting night traffic.	Measures are considered effective to manage the risk of vehicle strike.

4.6.8.1 Significant impact assessment

A formal significant impact assessment for the endangered koala is provided in Table 4.

Table 4-15 EPBC Act significant impact assessment for endangered koala

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of a population	Likely. The number of koala sightings/signs and significant areas of Preferred and General habitat distributed throughout the Project Site suggest that the local population of koalas is likely to be regionally significant. The local population could be reduced by loss or degradation of habitat, direct injury/mortality, and increased predation. Clearing of up to 15.46 ha of Preferred koala habitat in remnant vegetation, and 115.2 ha of General and 139.86 ha of General low habitat within non-remnant woodland vegetation is proposed, which represents a total of 2.69% of these habitat types available for foraging and breeding present on the Project Site. This habitat is recognised as habitat critical to the survival of the species and any clearing of this habitat has the potential to result in the decrease of the size of the local koala population. However, the clearing area will be further reduced by ongoing refinement and micro-siting during the construction phase to minimise impacts to koala habitat. The clearing footprint will additionally impact up to 347.16 ha of Dispersal habitat which represents 10.3% of the total available Dispersal habitat (3,370.89 ha) on the Project Site. When considering areas of koala dispersal habitat, such as open spaces and grasslands with scattered trees, the habitat quality lies in the facility of the land for koalas (Dr Bill Ellis, pers comm, April 2024). While this is an additional clearing of koala habitat, due to the linear nature of the infrastructure generally proposed in these areas, it is considered to maintain safe koala dispersal between areas of Preferred and General habitat and will not interfere long term with the provision of ecological function of the Dispersal habitat. For open spaces that are used by koalas for travel and to access landscape features critical to survival (particularly Preferred and General habitat), the impact will only last for as long as this facility is removed. Balanced against security of habitat and long-term management of feral pests, the management of koala movement and dispersal habitat may improve at sites where good management follows from an approved action (Dr Bill Ellis, pers comm, April 2024). Additional management measures such as no fencing of access tracks, pest animal management, and traffic management including low speed (<40 km/hr) internal maintenance access tracks, will ensure the facility of the Dispersal habitat will remain post construction.
Reduce the area of occupancy of the species	Unlikely. The Project will clear up to 270.52 ha of Preferred and General (including low quality) koala habitat and reduce the area of occupancy for the local populations by approximately 2.69% of the potential habitat within the Project Site. Impacts will be further reduced by ongoing refinement and micro-siting to reduce clearing. Provided that recommended mitigation measures are successfully implemented, the Project will not displace koalas from a significant proportion of the Project Site. However, it is still likely that the area of occupancy of the species will be reduced in the local area.
Fragment an existing population into two or more populations	Unlikely. Fragmentation of koala habitat through the construction of access tracks and other infrastructure may make koalas more vulnerable to vehicle collisions and predators such as wild dogs. However, given the already fragmented nature of the Project Site and the relatively small proportion of

Significant impact criteria	Assessment of the Project Site
	suitable habitat to be cleared, the current Project is unlikely to increase fragmentation of habitat to result in a significant impact to the species. Strict traffic management procedures during both construction and operation (e.g. limited access routes, speed controls, limited night traffic with reduced speeds during breeding season) and pest animal management will reduce potential impacts of access tracks resulting in fragmentation. Rehabilitation works, where possible, will include planting of locally important koala trees, especially in areas that provide connectivity between larger habitat patches.
Adversely affect habitat critical to the survival of a species	Likely. The current koala guidelines do not specify areas of critical koala habitat. Under the repealed previous koala guidelines (DoE, 2014b), the Project Site contains habitat critical to the survival of the koala within inland areas. The Project will result in the clearing of up to 270.52 ha of Preferred and General (including low quality) koala habitat that would provide foraging, breeding or shelter. An additional 347.16 ha of Dispersal habitat, however habitat critical to the survival of the koala is considered to occur within the Preferred and General (including low quality) foraging habitats at the Project Site. The dispersal habitat is not considered to meet the definition of habitat critical based on information provided in the species' Conservation Advice, summarised as follows: • Dispersal habitat will not be critical for the species' survival during periods of stress • Dispersal habitat contains scattered foraging opportunities, but is not critical to support the species' essential life cycle requirements (foraging, shelter and breeding) at the Project Site • Dispersal habitat is not necessary to maintain genetic diversity, given the suitable connectivity available within the Preferred and General habitat to move through the landscape resulting in Dispersal habitat unlikely to be preferred by the species for traversing the Project Site • Dispersal habitat does not play a critical role to ensure the long-term future of the koala through reintroduction or re-colonisation. While proposed mitigation measures (ongoing refinement and micro-siting of infrastructure, weed and pest animal management, rehabilitation) will further reduce direct and indirect impacts on habitat, the Project is likely to adversely affect critical koala habitat (Preferred and General habitats).
Disrupt the breeding cycle of a population	Likely. Koala home ranges vary widely from 3 to 500 ha, with the home range of the dominant male overlapping with home ranges of several females (DECC, 2008; DAWE, 2022a). Koalas are most active during the breeding season from September to February with males seeking females and sub-adults dispersing from their mother's home range (Dique *et al.*, 2003; DAWE, 2022a). The removal of subadult males by trauma has the potential to critically disrupt geneflow (DAWE, 2022a). The risk of geneflow disruption is exacerbated by the higher mobility in subadult males compared to their female counterparts, increasing their vulnerability to fatal encounters with vehicles and dogs. During the breeding season, koalas are at a greater risk of mortality from predation and vehicle strike, especially in fragmented landscapes. Measures to mitigate impacts to breeding cycles will include ongoing refinement and micro-siting to reduce clearing and fragmentation (although the Project Site is already highly fragmented), strict traffic management procedures (e.g. limited access routes, speed controls, limited night traffic with reduced speeds during breeding season), and monitoring and control of predators (including implementation of a pest animal management plan).

Significant impact criteria	Assessment of the Project Site
	However, as clearing and construction operations are likely to occur during breeding season disruption to the breeding cycle of the local population cannot be discounted, although this would be temporary during the construction period only, with no disruption to breeding expected during operation.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. The Project will require clearing of up to 270.52 ha of Preferred and General (including low quality) koala habitat, which represents 2.69% of these habitat types within the Project Site. Clearing of up to 347.16 ha or 10.3% of available Dispersal habitat will also occur. Impacts to these habitats will be further reduced by ongoing refinement and micro-siting to reduce clearing. The Project Site contains habitat critical to the survival of the koala, including Preferred and General habitat. Reduction in areas of koala habitat containing food tree species may reduce the availability of food resources for koalas and may lead to trees being unsustainably over-browsed or koalas leaving the area in search of new and higher quality food resources. These impacts, while possible on a local level, will not occur on a scale that will likely cause the species to decline. Measures to minimise impacts to habitat quality will include weed and pest animal management, erosion and sediment control, dust suppression and off-site rubbish disposal. The Project will lead to some clearing and limited fragmentation of koala habitat. However, given the relatively small percentage of available habitat to be cleared within the Project Site and the already fragmented nature of the Project Site due to existing farming practices, it is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat	Unlikely. Koalas are threatened by dogs (domestic and wild) when they come down to the ground between trees or travel to new areas. Dogs are already well established within the region, so the proposed activity is unlikely to result in dogs becoming more prevalent or moving into previously uninhabited areas. However, the Project may increase population levels of introduced predators during the operation phase, through an increase in available food resources (e.g. carcasses from turbine strike during operation or rubbish and food scraps during construction). Provided pest animal management is undertaken along with carcass monitoring, introduced predator populations can be managed to avoid impacts to the koala population.
Introduce disease that may cause the species to decline	Unlikely. Koalas have been impacted by chlamydia, which is prevalent in some populations, including those in Queensland. Most koalas observed during the surveys displayed the tell-tale 'dirty bottom' appearance of chlamydia infection. Stress caused by land clearing and habitat reductions are known to exacerbate chlamydia in koalas. The proposed Project will result in clearance of koala habitat that could increase stress in the short term but is unlikely to cause a long term increase in stress-induced disease. Stress will be further reduced by sequential clearing, which involves staged clearing of trees to allow koalas to relocate without human intervention, and the temporary retention of any tree in which a koala is present.
Interfere with the recovery of the species.	Unlikely. The proposed activity in its current form will clear up to 270.52 ha of Preferred and General (including low quality) koala habitat, leading to a

Significant impact criteria	Assessment of the Project Site
	reduction in the availability of these koala habitats in structural terms and in the form of local food availability. Provided that recommended mitigation measures as described above and in Fauna Management Plan (Ecosure, 2025c) (refer Appendix G) are successfully implemented, the Project is unlikely to interfere with the recovery of the species on a regional or national level.
Overall impact assessment	The proposed Project is likely to have a significant impact on koala, after all practical impact mitigation measures are applied.

4.6.9 Impacts to greater glider

Nocturnal spotlighting surveys detected 76 greater gliders within and adjacent to the Project Site. Gliders were distributed across numerous areas of remnant and HVR forest (REs 11.3.25, 11.11.4, 11.11.15, 11.12.3 and 11.12.6) throughout the Project Site, primarily on hill crests (Part A2 Figure 3-17). Out of 76 total sightings of greater glider, 36 were within the Project Site and 40 occurred in vegetation adjacent to the Project Site (along Kingaroy Burrandowan Road and in properties now excluded from the Project Site to reduce impacts, in habitat identical to that occurring in the Project Site).

The Project may clear up to 15.46 ha of preferred greater glider habitat with an associated potential loss of hollow-bearing trees used for denning. Up to 112.08 ha of Potential habitat with future food and den trees in non-remnant woodland areas may be cleared. An additional 142.58 ha of greater glider dispersal habitat may also be cleared. However, only 2.75% of all mapped greater glider habitat within the Project Site is proposed to be cleared. Greater gliders require large hollows that usually take over 150 years to form in eucalypts, use 4-20 den trees each, and will co-utilize the same dens at different times (Smith, Mathieson and Hogan, 2007). Nest boxes suitable for greater gliders will aid to minimise impacts of unavoidable clearing of any potential denning hollows in mapped glider habitat.

Tracks will cause some limited fragmentation. Greater gliders can traverse gaps 75 m to 100 m in width (Van Dyck and Strahan, 2008), however, gaps of 55 m wide across roads have been reported to create a complete barrier for greater gliders attempting to move between adjacent forest patches (Taylor and Goldingay, 2009). In addition to the impacts of habitat loss, fragmentation of remnant habitat patches by clearing areas greater than the maximum glide distance in width may force gliders to traverse across the ground increasing their susceptibility to predation (Taylor and Goldingay, 2014).

The clearing footprint avoids most large blocks of habitat suitable for greater glider and generally maintains quite narrow access tracks (<50 m). However, there are some areas of unavoidable wide linear clearing areas, usually associated with overhead line installation (requiring clearing widths of approximately 60 m). At one location along Jumma Road, in mapped Preferred foraging and denning habitat, the clearing creates a wider than usual corridor where the installation of overhead electrical infrastructure is parallel to the existing road. At this location the clearing widths vary between 35 m to 120 m wide. The works at this locality have been designed to reduce impacts as much as possible, by including two residual patches of vegetation, approximately 20 – 30 m wide and 200 – 300 m long, to facilitate greater glider movement across Jumma Road (refer Part A2 Figure 3-16), along with strategic location of a string of glide poles and narrowing of the overhead line clearing footprint as much as possible (to be determined during detailed design).

Pre-clearing surveys will be undertaken to inform, where possible, micro-siting of Project infrastructure within the clearing footprint that minimises loss of tree hollows, clearing and fragmentation of habitat. As a precautionary measure to mitigate against potential fragmentation of populations, strategic installation of fauna crossing infrastructure (e.g., glider poles) will assist in locations where the width of the clearing footprint cannot be reduced to a suitable glide distance (based on tree height data).

Operational activities are unlikely to directly impact significantly on greater gliders.

4.6.9.1 Fragmentation and gliding distance

The clearing of vegetation and habitat associated with the Project has the potential to have an indirect impact to greater glider through increased fragmentation of habitat and reduced connectivity between patches of habitat. To assess these potential indirect impacts it was necessary to review the existing

species habitat connectivity, along with areas of increased fragmentation, and compare this with species gliding dynamics.

Available studies on glide dynamics are variable among glider species. In one study in low-canopy forest (20 – 30 m tree height), yellow-bellied gliders launched into glides from horizontal branches and landed on the trunks of trees (Goldingay, 2014). The animals observed in this study glided an average distance of approximately 25 m, on average initiating the glide from a height of 18.5 m.

Squirrel gliders successfully use 6.5 m glide poles spaced 5 – 12 m apart to cross land-bridges over two roads in which the shortest distance between canopies was 50 – 60 m (Taylor and Goldingay, 2011). The squirrel glider is smaller than the greater glider and has an average glide distance of 21.5 m (Goldingay and Taylor, 2009).

It's been reported that the greater glider is capable of glides up to 100 m (McCarthy and Lindenmayer, 1999), though the gliding distances of the species are not well documented and 100 m is likely to be an extreme outlier, and the height of trees used to achieve this gliding distance was not documented. Although, there are no documented glide angles for greater glider, Jackson (1999) reported a glide angle of 28.26°-29.69° (glide ratio of approximately 1.8) for the Mahogany Glider and Sugar Glider. Older studies by Wakefield (1970) reported a glide angle of 40° (glide ratio of 1.2) for greater glider, while other anecdotal observations (R. Kavanagh pers. coms.) have measured glide angles of 31° (glide ratio 1.66) for the species (Taylor and Goldingay 2009). Taylor and Goldingay (2009) note that while more research is required on the gliding behaviours of greater gliders and if the species uses gliding poles to cross areas of fragmentation, wooden glider poles 20 m high should facilitate a glide distance of approximately 33 m. Further research by Goldingay (2014) reported a mean glide ratio of 2.0 (glide angle of 27.3°) for the yellow-bellied glider in 20-30 m high open forests in Victoria and that this should be used to estimate gliding distance for yellow-bellied gliders when developing connectivity management for the species. The gliding ability of the species is dependent on the area of the gliding membrane and other morphological attributes, as such it is reasonable to conclude the gliding behaviour and distance, although also determined by canopy structure, are similar for all gliding marsupials of similar attributes such as the yellow-bellied glider and greater glider. Therefore, a maximum glide distance of 2.0 and a precautionary glide ratio of 1.6 has been adopted for the purpose of this assessment.

A fragmentation assessment was completed, assessing glide barriers from refined greater glider habitat mapping, alongside lidar tree height data. To determine glide distance buffers were placed on both the edges of vegetation patches (based on average tree height data for each habitat patch/polygon) and on the individual tree point height data, using both a glide ratio of 2.0 (Goldingay 2014) and a conservative ratio of 1.6. The assessment considered adjacent areas of unverified vegetation suitable for dispersal that adjoin the Project Site, as these areas include available adjacent connectivity and dispersal opportunities for greater glider.

An assessment was completed for existing barriers in the Project Site between vegetation patches where gaps exceeded the maximum gliding distance in both directions for greater gliders. This process was done prior to considering the clearing footprint in order to determine pre-existing dispersal barriers. Part A2 Figure 4-1 shows the location of the existing barriers and the patches of habitat disconnected and isolated in the landscape from other patches within the Project Site. Most of these barriers occur in the north-west and southern sections of the Project Site and are reflective of the land practices in these areas where increased land clearing has resulted in highly fragmented habitat.

An assessment for any additional gliding barriers created by the Project (pre-mitigated barriers) and maintained connection points (where retention of tall trees adjacent to the clearing footprint will maintain a suitable glide distance and a connection point across the clearing footprint) was determined by clipping the greater glider habitat to the edge of the clearing footprint and intersecting the tree height data to the remaining greater glider habitat (outside of the clearing footprint). This tree height data (outside the clearing footprint) was used to identify areas where the clearing footprint is greater (for barriers) or smaller (for connection points) than the possible glide distance determined from the adjacent tree height data within the adjacent habitat patch. This assessment considered areas of existing landscape barriers across the Project Site, patches below 3 ha, habitat quality (Preferred versus Potential versus Dispersal habitat), confirmed species observations and connectivity to adjacent unverified vegetated areas outside of the Project Site. Part A2 Figure 4-2 shows locations of maintained connection points and pre-mitigated dispersal barriers.

Once the barriers were determined mitigation options were identified for each barrier (Table 4-16) at key locations to minimise fragmentation and maintain landscape connectivity to the greatest extent practicable for greater glider. This also considered examining adjacent and alternate landscape connection points to restore connectivity. The process for assessing the mitigation measures included:

a. Examining alternative landscape connections (i.e. connectivity adjacent to these barriers that can be maintained or enhanced).

b. Determining areas along Project access tracks at a location along the barrier where the clearing footprint can be narrowed (<25 m wide) through detailed design, in order to retain tall trees on either side of the corridor and thereby maintaining a suitable glide distance for the greater glider at those barriers.

c. Determining areas that through detailed design may include the maintenance of remnant patches of vegetation between tracks and overhead lines where possible (i.e., along Jumma Road).

d. Considering areas that can include the installation of a string of glide poles in areas where the clearing footprint is less likely to be able to be narrowed to an achievable glide distance (i.e. overhead transmission lines) – these have been identified on the map as hatched areas along specific barriers, with one string of glide poles proposed in these locations. The final location of the glide pole string will be subject to detailed design of the tower placement, topography and overhead line sagging profile (minimum heights), along with location of habitat for connectivity. Due to overhead electrical safety considerations, multiple strings of glide poles are unable to be installed at regular intervals, as such, key locations have been determined to best support connectivity in the landscape based on adjacent habitat and existing connection points in the landscape.

Part A2 Figures 4-3 and 4-4 show locations of maintained connection points, existing barriers, mitigation points, landscape connection points, indicative locations for glider pole installation where overhead lines occur and mitigated dispersal barriers.

The fragmentation assessment determined that with mitigating measures no small patches of Preferred or Potential habitat were fragmented or are required to be offset for indirect impacts.

Table 4-16 Mitigated Project barriers identified during fragmentation assessment

Barrier number	Infrastructure type	Mitigation details
1	access tracks	narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
2	access tracks	narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
3	access tracks and underground reticulation lines	narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
4	33 kV overhead line and access track	glide poles/retain tree, maintain near to 33 kV overhead lines poles and retain above 15 m in height
5	34 kV overhead line and access track	glide poles/retain tree, maintain near to 33 kV overhead lines poles and retain above 15 m in height
6	access tracks	narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
7	access tracks	retain trees at connection to the south, narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
8	access tracks and underground reticulation lines	glide poles/retain tree, maintain overhead lines to above 15 m in height
9	access tracks and underground reticulation lines	string of glide poles under 275 kV line and maintain alternate landscape connection point to the west
10	275 kV overhead line	string of glide poles under 275 kV line

Barrier number	Infrastructure type	Mitigation details
11	275 kV overhead line	string of glide poles under 275 kV line
12	275 kV overhead line	string of glide poles under 275 kV line
13	275 kV overhead line	Jumma Road, strings of glide poles under 275 kV line, pinch points between track and 275 kV
14	underground reticulation lines	Underground reticulation only, narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
15	underground reticulation lines	Underground reticulation only, narrow clearing to no more than 25 m wide for a minimum of 20 m along the track, poles/retain tree on either side
16	access tracks and underground reticulation lines	alternate landscape connectivity
17	access tracks and underground reticulation lines	alternate landscape connectivity
18	access tracks	alternate landscape connectivity

During the progress of the Project design and through the fragmentation assessment, there was one location that was determined to be the area of main fragmentation concern for gliders within the Project Site, occurring within a patch of remnant vegetation providing Preferred foraging and denning habitat for greater glider along Jumma Road. Over time the proposed design in this area has been improved to avoid impacts associated with fragmentation. The initial design proposed a 100 m wide clearing width to accommodate the construction of the 275 KV overhead line that would connect the infrastructure in the north and east of the Project Site to the existing transmission line, alongside the existing road which is proposed to be upgraded to allow for access and transport of Project infrastructure and to be a main Project access track. The design has now been revised to maintain patches of habitat which provide stepping stones between the overhead transmission line and the access track maintaining connectivity to the remnant areas either side of the clearing footprint and install strings of glide poles within the transmission clearing footprint. These habitat patches along with the strategic installation of glide poles has reduced the fragmentation impacts along this section of Jumma Road.

Alternative routes were explored for this access track and transmission line, however for the reasons stated in Section 4.3.2, it was unable to be shifted. As such, the Project has addressed fragmentation to fauna, in particular gliders, through avoidance, mitigation and offsets of residual impacts.

Avoidance of impacts where possible have included the following:

- The Project has gone through several design and layout changes since its first proposal in 2018. Many of these changes have been to avoid impacts on MNES, in particular greater gliders that were first identified in surveys in 2019. The design changes include:
    - Infrastructure refined based on reduction of WTGs, from 151 to 97 WTGs.
    - Site boundary changed to exclude large areas of remnant vegetation from the Project Site and areas of high glider prevalence along Kingaroy Burrandowan Road (37 glider sightings occurred in vegetation adjacent to the Project Site area along Kingaroy Burrandowan Road and in properties now excluded from the Project Site, in habitat identical to that occurring in the Project Site).
    - Shifted WTGs to locations outside patches of remnant vegetation to minimise impacts associated with habitat alienation and minimise clearing of remnant vegetation wherever possible, in turn minimising further fragmenting the Project Site and reducing edge effects on areas of remnant vegetation. Infrastructure was refined based on the reduced WTG design and in turn a reduced clearing footprint. The areas of remnant vegetation and modelled fauna habitat that will be impacted have been minimised, particularly impacts on

the current mapped koala and glider habitat which have reduced by approximately 50% since initial design (applying the same habitat mapping rules).

- The Project design avoided clearing to create new roads by utilising existing internal roads and tracks on the Project Site wherever possible. This not only minimises clearing across the entire Project Site but also reduces the impacts of cut and fill required to traverse areas of increased topography changes (which would create large gaps in the landscape and in turn the mapped fauna habitat [in particular the potential foraging and denning habitat for greater gliders]).
- Utilising the existing transmission line infrastructure to avoid clearing for new infrastructure required to support the Project. Wherever possible proposing to install underground cable to reduce the ongoing potential impacts of overhead transmission infrastructure.

Mitigation of impacts where avoidance is not possible includes:

- Impacts to foraging and denning habitat will be reduced by:
  - Ongoing refinement and micro-siting of access tracks and WTGs during construction to reduce clearing of important greater glider denning habitat.
  - To facilitate movement across the Jumma Road Preferred habitat, the Project design has maintained patches of remnant vegetation between the access track and overhead transmission line clearing footprint. These patches of vegetation are approximately 20 - 30 m wide and 200 – 300 m long and will provide gliding and resting opportunities for gliders traversing this section of Jumma Road (Part A2, Figure 3-16).
  - The Project is committed to installing glide poles within the Project 275 kV overhead transmission line corridor (where safety restrictions allow) and where possible between the access tracks and/or transmission lines to allow gliders to traverse the clearing footprint between the remnant vegetation patches. The design and spacing of the glide poles will be completed during detail design with inputs from both suitably qualified engineers and ecologists and will be designed with a glide ratio of 1.6 – 2.0 to ensure gliders can traverse without having to go to ground. The remainder of the Project design has generally limited clearing widths of <50 m, however, where detailed design for the track, drainage and corridor for electrical reticulation results in clearing wider than the maximum glide distance (based on tree height data and a glide ratio of 1.6) in greater glider habitat, glide poles will be installed at key points to avoid gliders having to traverse the ground. Monitoring of glide poles will be completed and organised to ensure the data has a meaningful contribution to the scientific knowledge of the species biology and movement. Installation and monitoring of glide pole strings in the rural environment of the Project Site to facilitate the crossing of the Jumma Road corridor will help to mitigate the impact of fragmentation at this location.
- Additional mitigation measures to reduce fragmentation impacts to greater glider 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 (if required)
  - strict traffic management procedures (e.g. limited access routes, speed controls, limited night traffic with reduced speeds at <40 km/hr)
  - weed and pest animal management during the construction and operational phase of the Project
  - post construction rehabilitation in areas of the clearing footprint not required to remain clear for operation (e.g. temporary laydowns, construction compounds, unused verges alongside tracks)
  - installation of temporary exclusion fencing during the construction phase in areas of mapped glider habitat
  - installation of nestboxes in adjacent habitat at a ratio of 2:1 of similar size and structure for each hollow removed from the clearing footprint suitable for greater glider. Nest boxes will be installed in advance of clearing active glider hollows, to allow the resident population to become aware of their availability

- avoid clearing and retain any large hollow-bearing trees (where engineering allows) that provide important denning habitat for threatened species (e.g. greater glider)
- 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
- clearly identify and mark out the extent of clearing and “no-go” zones prior to clearing activities
- 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).

Offsets are proposed for the residual significant impact to greater glider of approximately 270.12 ha of modelled greater glider habitat, including 15.46 ha of Preferred foraging and denning habitat, 112.08 ha of Potential foraging and future denning habitat and 142.58 ha of Dispersal habitat. Impacts to greater glider habitat will be offset in accordance with the EPBC Act offsets assessment guide and spreadsheet (DSEWPAC 2012b), and an OMS and OAMP, which will be developed to offset for 100% of the residual impact to the greater glider from the proposed Project.

The impacts to the greater glider, the likely duration and extent of those impacts, and the avoidance, minimisation, and mitigation measures applied to reduce the impact are detailed in Table 4-17. An assessment of impacts on greater glider is provided in Table 4-18.

Table 4-17 Impacts and mitigation measures for the endangered greater glider

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Habitat loss and loss of denning hollows	The Project design will remove up to 15.46 ha of Preferred foraging and denning greater glider habitat, up to 112.08 ha of modelled Potential foraging and future denning habitat, and 142.58 ha of Dispersal habitat during the construction phase of the Project.	• Clearing in modelled greater glider habitat has been minimised by design. In particular, large areas of remnant vegetation were excluded from the Project clearing footprint. • Micro-siting of infrastructure within the clearing footprint to avoid hollow bearing trees, wherever possible during construction. • Rehabilitation of cleared areas upon decommissioning. • Replacement of suitable denning hollows which are unavoidably cleared at a rate of two nest boxes for every one hollow removed.	Measures considered effective at managing the effects to greater glider. Nevertheless, provision of offsets will be made under an Offset Area Management Plan (Appendix O), to compensate for loss of greater glider habitat and to enhance landscape-scale connectivity.
Fragmentation of habitat	Clearing of vegetation for tracks and infrastructure may increase distances between habitat patches, reducing the ability of greater gliders to traverse those distances and resulting in isolation of populations. This impact will occur at construction and throughout the operational life of the wind farm (30 – 40 years). The Project Site landscape is already highly fragmented from previous clearing and land us activities, as such the greatest impact of fragmentation will occur in a patch of remnant vegetation and modelled greater glider habitat along Jumma Road, which will be widened in places up to 120 m.	• Utilisation of existing roads and tracks in Project design to avoid adding new points of fragmentation in the landscape. • Rehabilitation of cleared areas upon decommissioning to minimise distances between habitat patches. • Retention of existing trees / habitat patches between adjacent access tracks where possible to act as stepping stone habitat. • Installation of glider poles suitable for greater glider use in areas where the clearing footprint is greater than the maximum glide distance (based on a 1.6 glide ratio) at strategic locations along the clearing footprint and within areas of modelled glider habitat. • . • Design of the glide pole and spacing will be completed during detailed design and take into consideration engineering, safety and ecological requirements as directed by suitably qualified experts in these areas, any/all relevant guidelines, and in agreement with DCCEEW.	Measures are considered effective to manage the impacts of loss of connectivity.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Increased risk of predation	Risk is likely to be highest during construction when high numbers of personnel are present and habitat disturbance is occurring. Habitat clearing may create habitat gaps large enough to cause greater gliders to use the ground to cross cleared areas, which increases risk of predation by wild dogs, European foxes, or feral cats.	• Predator control if signs of greater glider predation or increased predator numbers are observed during construction. • Waste management during construction and operation to ensure food wastes are secure and will not attract introduced predators. • Implement actions detailed in a project specific pest animal management plan.	Measures are considered effective to reduce the likelihood of the Project exacerbating predation by introduced predators.
Vehicle strike	Increased vehicle and plant use of the Project Site may increase risk of vehicle strike, particularly where tracks bisect remnant vegetation patches. Risk is likely to be highest during construction when traffic to and within the Project Site is high. Risk will continue throughout the operational phase of the Project (30 – 40 years), though vehicle use and therefore strike risk will be lower during the operational phase.	• Traffic management to minimise collisions during construction and operational phases. • Traffic management measures which will be implemented include limiting access routes, strict implementation of speed limits, and limiting night traffic.	Measures are considered effective to manage the risk of vehicle strike.
Disruption to breeding	Risk is likely to be highest during construction when high numbers of personnel are present and habitat disturbance is occurring, including the removal of hollow bearing trees and in turn available denning trees for breeding.	• Active nocturnal spotlighting searches for greater gliders during pre-clearance surveys for signs of denning prior to clearing works each day. • Clearing will avoid areas of greater glider habitat during March to June where the construction schedule allows. • 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 prior to clearing. • Safe clearing practices, including inspection of confirmed or suspected dens, gentle tree removal (using soft fall and vertical tree grabs) for any trees with hollows, and leaving trees in situ where	Measures are considered effective to manage the risk of breeding disruption.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
		sheltering or breeding confirmed to allow self-relocation. • Replacement of suitable denning hollows which are unavoidably cleared at a rate of two nest boxes for every one hollow removed.	

4.6.9.2 Significant impact assessment

Table 4-18 EPBC Act significant impact assessment for endangered greater glider

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of a population.	Unlikely. The number of greater glider sightings and significant areas of suitable habitat distributed throughout the Project Site suggest that the local population of greater gliders is likely to be regionally significant. The local population could be reduced by loss or degradation of habitat, direct injury/mortality and increased predation. The Project will require clearing of up to 15.46 ha of Preferred habitat and 112.08 ha of Potential habitat, which provides future habitat attributes, and an additional 142.58 ha of dispersal habitat. These areas represent a small proportion of 2.75% of available habitat within the Project Site (all habitat types). Approximately, 99% of the Preferred habitat and 97.3% of the Potential habitat on the Project Site will remain unimpacted and be retained to maintain the existing greater glider population within the Project Site and ensure future food and den tree resources. Additionally, 96.5% of dispersal habitat on the Project Site will remain. Immediately adjacent to the Project Site, there is significant vegetation supporting greater glider, particularly along Kingaroy-Burrandowan Road and the remnant vegetation to the north-east. This is supported by surveys completed by Ecosure early in the Project and again by SLR in 2025, which recorded large numbers of greater gliders in these extensive areas of suitable habitat (refer Appendix T). As the Project design has progressed, the Project footprint has been reduced and these areas removed from the Project Site, minimising the potential impacts to greater glider. Impacts to foraging and denning habitat will be reduced by ongoing infrastructure layout refinement and WTG micro-siting to reduce clearing. Measures to minimise injury / mortality will 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 (if required), traffic management to minimise collisions (i.e. reduced speed limits to <40 km per hour), minimise track widths, retention of tall trees adjacent to the clearing footprint, install and monitor permanent fauna movement infrastructure (e.g. glider poles), undertake pest management and install temporary exclusion fencing during the construction phase in areas of mapped glider habitat. Although, there is limited research of glide pole use by greater gliders, which are considered to have high site fidelity and limited dispersal (Suckling, 1982; Taylor, Tyndale-Biscoe and Lindenmayer, 2007), there are studies to show glide poles have been successful at repeated use by more active species such as yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (Taylor and Rohweder, 2020). Installation and monitoring of glide poles in the rural environment of the Project Site to facilitate the crossing of the wide clearing areas will inform the degree of success of this mitigation measure. This is particularly relevant to facilitate movement across the Jumma Road Preferred habitat, where the Project design has maintained two patches of remnant vegetation within the clearing footprint (approximately 20 – 30 m wide and 200 – 300 m long) (Part A2 Figure 3-16). These patches will provide gliding and resting opportunities for gliders traversing this section of Jumma Road. Provided these measures are successfully implemented, the Project is unlikely to lead to a long term decrease in the size of the local population.
Reduce the area of occupancy of the species	Unlikely. The Project will require clearing of up to 15.46 ha of Preferred foraging and denning greater glider habitat, which represents only 0.95% of the Preferred habitat within the Project Site. Potential foraging and future denning habitat

Significant impact criteria	Assessment of the Project Site
	(112.08 ha) to be impacted represents 2.74% of the 4,096.2 ha of this habitat type mapped on the Project Site. Dispersal habitat (142.58 ha) to be impacted represents 3.47% of the available 4,113.67 ha of this habitat type mapped on the Project Site. Additionally, surveys recorded large numbers of greater gliders in extensive areas of suitable habitat immediately north of the Project Site that will not be impacted by this Project. The area of habitat available for occupation by greater glider across the Project Site will not be significantly reduced by the proposed Project. Impacts will be further reduced by ongoing refinement and micro-siting to reduce clearing of important greater glider denning habitat. Provided the recommended mitigation measures are successfully implemented, the Project will not displace greater gliders from a significant proportion of the Project Site and will therefore not reduce the area of occupancy of the local population.
Fragment an existing population into two or more populations	Likely. Fragmentation of greater glider habitat through the construction of access tracks and other infrastructure may result in greater gliders moving across the ground making them more vulnerable to vehicle collisions and predators such as wild dogs. The planning corridor avoids most large blocks of Preferred habitat and Potential habitat for greater glider, which primarily occurs in the hilltop remnant vegetation. However, there is one section of Preferred habitat along Jumma Road where clearing has the potential to increase fragmentation of a habitat patch known to previously support greater glider (no records of greater glider were observed during the 2025 surveys). Clearing in this section will be minimised as far as possible. To facilitate movement across the Jumma Road remnant Preferred habitat the Project design has maintained two patches of remnant vegetation within the clearing footprint (approximately 20 – 30 m wide and 200 – 300 m long) and will install glide pole strings in the overhead transmission line clearing footprint. During the ongoing Project design, the clearing will be kept to less than the maximum glide distance for greater glider wherever possible. Where detailed design for the track, drainage and corridor for electrical reticulation will clear spans wider than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6), potential mitigation measures such as glide poles will be installed at key points to avoid gliders having to traverse the ground. Although, glide poles have had limited success in southern states when installed for road crossings, installation (along with monitoring) of these structures in this rural area will aid in minimising the impact of habitat fragmentation of glider habitat particularly where overhead transmission lines are required. Strict traffic management procedures (e.g. limited access routes, speed controls, limited night traffic with reduced speeds at <40 km/hr) will further reduce potential impacts of access tracks on habitat fragmentation, along with pest animal management during operation phases of the Project. As discussed above although there is limited evidence of greater glider use of glide poles (GHD, 2017), there are studies to show glide poles have been successful with repeated use by more active species such as yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (Taylor and Rohweder, 2020). The fragmentation assessment detailed above, along with the mitigation measures for any identified barriers detailed in Table 4-16 The fragmentation assessment determined that with mitigating measures no small patches of greater glider habitat were fragmented or required to be offset for indirect impacts. Greater gliders were recorded across the Project Site in a range of habitat patches and given the separation between habitat patches and records, are likely to have well separated, discreet home ranges. The population occupies

Significant impact criteria	Assessment of the Project Site
	separate remnant habitat patches across the Project Site. The clearing area will result in predominately narrow linear clearing widths (generally <50 m wide), however there are some sections such as Jumma Road where clearing widths exceed this width and the proposed Project may result in further fragmentation of the local population in these small habitat patches, without mitigation measures. The design and spacing of the mitigation measures and glide pole strings will be completed during detail design and will be designed with a glide ratio of 1.6 – 2.0, taking into consideration engineering, safety and ecological requirements as directed by suitably qualified experts in these areas, any/all relevant guidelines, and in agreement with DCCEEW.
Adversely affect habitat critical to the survival of a species	Likely. Habitat critical to the survival of greater glider (Eyre *et al.*, 2022) is defined in Section 2.5 of the Supplement to the MNES report (refer Appendix E) and habitat meeting any one of the criteria is considered critical. This includes large contiguous areas of vegetation containing suitable food and den trees and smaller patches that provide connectivity. Habitat modelling shows there is Preferred foraging and denning habitat, comprised of REs with confirmed records and suitable habitat attributes, and Potential foraging and future denning habitat which offers food resources and potential future den trees, present on the Project Site. There are 36 sighting records of greater glider across the Project Site and a further 40 sightings in habitat adjacent to the Project Site. The proposed Project will remove 15.46 ha of Preferred habitat, which is 0.95% of the 1,631.71 ha of mapped Preferred habitat within the Project Site. It will further impact 112.08 ha or 2.74% of the 4,096.2 ha of mapped Potential habitat. A further 142.58 ha of Dispersal habitat will be impacted, which is 3.47% of the available 4,113.67 ha available on the Project Site. While proposed mitigation measures (ongoing refinement and micro-siting of infrastructure, weed and pest animal management, rehabilitation) will further reduce direct and indirect impacts on habitat, the combined removal of up to 270.12 ha of habitat critical to the survival of greater glider is likely to have an adverse impact.
Disrupt the breeding cycle of a population	Unlikely. Strict traffic and construction management procedures (e.g. limited access routes into Preferred habitat areas, speed controls on all internal tracks <40 km/hr and limiting activities to daylight use as far as possible) will minimise impacts on this nocturnal species. Although, there is limited observations of greater glider using nest boxes (Menkhorst, 1984; Goldingay, Rohweder and Taylor, 2020), installation of nest boxes for all hollows unavoidably removed, may assist in mitigating impacts of the loss of any breeding hollows. The proposed level of clearing and ongoing disturbance is unlikely to disrupt the breeding cycle of greater glider.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely. The loss of 15.46 ha of mapped Preferred habitat is unlikely to decrease the availability or quality of habitat within the Project Site to the extent the species will decline. Up to 112.08 ha of Potential habitat will also be impacted, this being non-remnant and regrowth vegetation identified as a resource for future food and den trees. A further 142.58 ha of Dispersal habitat will also be impacted. The proposed clearing will be restricted to WTG pads, access tracks and associated infrastructure, which will not result in large areas of Habitat loss. Where possible, large hollow-bearing trees will be avoided by micro-siting of infrastructure guided by pre-clearing surveys. Potential habitat will eventually provide the habitat attributes necessary for the survival of local populations. The removal of 112.08 ha of Potential habitat represents 2.74% of the 4,096.2 ha of this habitat type mapped on the Project Site, with this unimpacted area retained

Significant impact criteria	Assessment of the Project Site
	to ensure future food and den tree resources are available. Clearing of Potential habitat in the form of linear clearance to access WTG pads and other infrastructure, it is not considered likely to decrease the availability or quality of habitat available for greater glider to the extent that the species will decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat	Unlikely. Greater gliders are known to be taken by wild dogs, dingoes and foxes (Maloney, 2007), and these predators were observed at the Project Site during field surveys. The Project is not likely to result in an invasive fauna species becoming further established in the species' habitat. However, the Project may increase population levels of introduced predators during the operation phase, through an increase in available food resources (e.g. carcasses from turbine strike). The implementation of a pest animal management, including carcass monitoring and removal, will manage predator populations to avoid impacts to the greater glider population. A pest animal management plan will be developed and implemented prior to operation, detailing the ongoing pest animal management during wind farm operation. Additionally, installation of fauna movement infrastructure (e.g. glide poles) on tracks wider than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6) through Preferred habitat will limit gliders traversing the ground, where they are at higher risk of predation. Some invasive weeds can increase the flammability of the habitat, amplifying wildfire risks. The proposed Project will implement appropriate weed management in accordance with a Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) for the areas within and adjacent to the clearing footprint, therefore is unlikely to result in the establishment of an invasive weed species that could harm greater glider habitat.
Introduce disease that may cause the species to decline	Unlikely. Greater gliders are not threatened by any disease that could be brought into the species' habitat by the Project.
Interfere with the recovery of the species.	Unlikely. The small amount of proposed clearing of mapped preferred habitat is unlikely to exacerbate the existing extent and degree of fragmentation across the entirety of the Project Site, only within a 1 km section of Jumma Road (refer Part A2 Figure 3-16). However, the clearing may also slightly reduce the availability of large hollows which provide important greater glider denning resources across the Project Site. The area of Preferred habitat to be impacted is up to 15.46 ha or 0.95% of the 1,631.71 ha mapped. The majority of impacts are to Potential habitat areas where trees are not yet of sufficient size to offer large hollows for denning. Protecting and retaining hollow-bearing trees is an important recovery action for the greater glider. Pre-clearing surveys will allow micro-siting of Project infrastructure to minimise the loss of tree hollows, clearing and fragmentation of habitat, avoiding any significant impact on species recovery. Avoidance of the majority of the mapped Preferred habitat will minimise interference with the recovery of the species. The loss of 112.08 ha of Potential habitat, which represents 2.74% of the 4,096.2 ha mapped on the Project Site, along with the loss of 142.58 ha of Dispersal habitat, is unlikely to interfere with the recovery of the species. A Bushfire Management Plan (refer Appendix L) has been developed for the Project and will be implemented to mitigate inappropriate fire regimes (such as high frequency or intensity fires) as a result of the Project actions. 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, to minimise the risk of glider entanglement.

Significant impact criteria	Assessment of the Project Site
	Pest animal management in accordance with a Project specific pest animal management plan will be undertaken during the operational life of the Project, alongside carcass monitoring, in order to manage predator populations and avoid impacts to the greater glider population.
Overall impact assessment	The proposed Project is likely to have a significant impact on greater glider, assuming all practical impact mitigation measures are applied.

4.6.10 Impacts to white-throated needletail

A total of 364 white-throated needletails were recorded flying above non-remnant vegetation across the following bird surveys: spring 2018 (n = 2), spring 2021 (n = 1), summer 2022 (n = 12), spring 2022 (n = 26), summer 2023 (n = 191), and spring 2023 (n = 132). White-throated needletail group sizes ranged from one individual to flocks of approximately 100 birds, with the higher numbers observed during summer storms. In any one survey period, the total number of white-throated needletail sightings ranged from one to 191 sightings. Recent counts in Australia range from single birds to flocks of hundreds (DoE, 2015a).

The large number of sightings over the summer and spring 2023 survey periods may include repeated sightings of the same individuals. Throughout the six-day survey, conditions were ideal for feeding for this species, with multiple weather fronts passing through generating updrafts which would carry insects to feeding height. It is possible that the ideal feeding conditions encouraged the same flock to remain in the area, resulting in a high number of sightings in total (n = 191), but not necessarily meaning that 191 individual birds were seen during the survey. The largest number of white-throated needletails observed at any one time was approximately 100 during spring 2023, concluding that at least 100 individuals were observed during that one survey period.

Repeated sightings are valuable for understanding bird utilisation in the Project Site but must be kept in mind when considering estimates of the number of individual birds which may experience impacts from the Project. The Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act (DoE, 2015a) considers 100 individuals to be an internationally significant proportion of the population and 10 individuals to be a nationally significant proportion of the population. The Project Site is therefore known to have supported both an internationally and nationally significant population of white-throated needletail over the survey period.

Studies using geolocators have shown that white-throated needletails move up and down the eastern coast of Australia and the Great Dividing Range and are capable of moving up to 900 km in a 24-hour period (Yamaguchi *et al.*, 2021). Within Australia the area of occupancy of white-throated needletail is greater than 18,000 km^2 (Threatened Species Scientific Committee, 2019).

White-throated needletail are almost exclusively aerial in Australia, but have been recorded roosting in dense foliage or tree hollows (Tarburton, 1993; Threatened Species Scientific Committee, 2019). Up to 15.46 ha of potential roosting habitat for white-throated needletail will be cleared within the clearing footprint for the construction of Project infrastructure (Part A2 Figure 3-18), however no roosting activity has been observed on-site. Construction activities are unlikely to impact significantly on feeding habitat, as this species is an aerial forager.

Potential operational impacts include blade strike when flying and foraging at RSA height and disturbance of foraging habitat for white-throated needletail caused by the WTG operations. Habitat disturbance will be minimised by micro-siting WTGs as far away as practicable from remnant vegetation. Blade strike issues are assessed and discussed in more detail in the BBUS (Ecosure, 2025b) (refer Appendix J). White-throated needletail are known to collide with WTGs in Australia (Hull *et al.*, 2013; Tarburton, 2021). As they also fly before and after daylight hours, Tarburton (2021) noted that they are at a greater risk of strike. Observations of white-throated needletail at the Project Site have ranged between morning (7:30 am, 9:30 am), noon (11:55 am) and evening (5:20 pm). An assessment of impacts on white-throated needletail is presented in Table 4-19.

4.6.10.1 Significant impact assessment

Table 4-19 EPBC Act significant impact assessment for vulnerable white-throated needletail

Significant impact criteria	Assessment of the Project Site
Lead to a long-term decrease in the size of an important population of a species	Likely. White-throated needletail were detected in five of the nine survey periods, predominately during spring and summer periods. Total sighting numbers ranged from 1 to 191 individual sightings over six day periods and flock sizes ranged from a single individual to 100 birds. DoE (2015) considers 100 individuals to be an internationally significant proportion of the population and 10 individuals to be a nationally significant proportion of the population. The Project Site therefore contained an internationally important population of white-throated needletail. Sightings were more prevalent during suitable atmospheric conditions, such as summer storms. White-throated needletail may aerially forage above the entire Project Site and could potentially roost within remnant/HVR woodland (although no roosting was recorded during surveys). Construction will have minimal impact on foraging habitat and will clear up to 15.46 ha of potential roosting habitat, which is only 0.95% of available habitat within the Project Site. Additionally, the Project Site is not close to the species' distribution limit and is surrounded by equivalent habitat containing known records of the species. White-throated needletail rarely roost in Australia, and so operational impacts (including collision with WTG blades) represent a higher risk of impact through direct mortality. Collision risk model mortality rate estimates for a population size of 1,000 white-throated needletails per migratory season, ranged from 0.012 (99.9% avoidance) to 0.612 (95% avoidance) individuals per migratory season (refer Appendix J). The risk of collisions will be monitored and adaptive management measures applied in accordance with the Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).
Reduce the area of occupancy of an important population	Unlikely. The estimated area of occupancy in Australia is over 18,000 km^2 (Threatened Species Scientific Committee, 2019). Clearing of 15.46 ha of roosting habitat will not significantly reduce the area of occupancy.
Fragment an existing important population into two or more populations	Unlikely. A nationally important population of white-throated needletail has been observed within the Project Site, however the species is a highly mobile aerial forager, so the Project is highly unlikely to fragment existing populations.
Adversely affect habitat critical to the survival of a species	Unlikely. Critical breeding habitat for the species does not occur in Australia. The Project will require clearing of 15.46 ha of potential roosting habitat, but this represents only 0.95% of similar habitat within the Project Site.
Disrupt the breeding cycle of an important population	Unlikely. White-throated needletail does not breed in Australia and so we consider for the purposes of this assessment that disruption of breeding activities (through removal of potential nesting habitat or behavioural disturbance) is unlikely to occur. However, turbine strike could impact the breeding cycle through the reduction of the population size. Ongoing carcass monitoring and revised risk assessments will be completed during the operational phase of the Project to continue to assess strike numbers and population impacts of white-throated needletail as detailed in the Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).
Modify, destroy, remove, isolate or decrease the	Unlikely.

Significant impact criteria	Assessment of the Project Site
availability or quality of habitat to the extent that the species is likely to decline	The Project will require clearing of 15.46 ha of potential roosting habitat, but this represents only 0.95% of similar habitat within the Project Site. White-throated needletail is a highly mobile species that forages aerially over most habitats, so the small clearing footprint is unlikely to significantly reduce foraging habitat.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Unlikely. No invasive species are known to threaten the white-throated needletail. The proposed Project will not result in the establishment of an invasive species that could harm white-throated needletails or their habitat.
Introduce disease that may cause the species to decline, or	Unlikely. White-throated needletails are not threatened by any known disease that could be brought into the species habitat by the Project.
Interfere substantially with the recovery of the species.	Unlikely. A recovery plan has not been prepared for this species. However, conservation actions focus on working with East Asia to protect breeding habitat and identify areas of important habitats in Australia. Although the Project will clear a small area of up to 15.46 ha of potential roosting habitat this is unlikely to impact on this highly mobile aerial species. The approved conservation advice identifies collision with WTGs and overhead wires as a threat to the species and a research priority is improving knowledge about potential threatening processes including the impacts of infrastructure (i.e., WTGs and overhead wires). Although surveys have shown the Project Site may at times support both an internationally (100 individuals) and nationally significant population (10 individuals) of white-throated needletail, the collision risk modelling identifies that only a small number of white-throated needletail individuals may collide with WTGs during operation. Mortality rates for a population size of 1,000 white-throated needletails (per season), ranged from 0.012 (99.9% avoidance) to 0.612 (95% avoidance) individuals per migratory season (refer Appendix J). However, ongoing monitoring of the strike risk to the population, including a comparison of annual fatalities against pre-determined significant impact thresholds, during the operational phase will help to mitigate impacts to the species and improve strike risk knowledge. Should fatalities exceed the threshold then an appropriate response and adapting management measures as detailed in the Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) will be implemented. If adaptive management measures are implemented (as required), the collision risk model results suggest that the risk of collision mortality is unlikely to be of a sufficient magnitude to interfere with the recovery of the species.
Overall impact assessment	The proposed Project may have a significant impact on white-throated needletail, due to a risk of WTG strike after all practical impact mitigation measures are applied. However, the small area of up to 15.46 ha of potential roosting habitat is not considered to contribute to this significant impact given this is a highly mobile aerial species.

4.6.11 International obligations

4.6.11.1 UN Convention on Biological Diversity

Australia became party to the United Nations Convention on Biological Diversity in 1993. The objectives of the convention as stated are (Secretariat for the Convention on Biological Diversity, 2011):

- the conservation of biological diversity
- the sustainable use of its components

- the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources.

Parties to the Convention are required to develop a national biodiversity strategy and action plan (NBSAP) to detail the national strategies and plans which will be adopted to achieve the goals of the Convention. Australia's NBSAP is *Australia's Strategy for Nature* (Commonwealth of Australia, 2019), which contains goals for the integrated national management of natural areas and biodiversity values.

The Kunming-Montreal Global Biodiversity Framework was adopted by parties of the Convention on Biological Diversity in 2022. As part of the adoption of this new framework, Australia has committed to (DCCEEW, 2023a):

- protect and conserve 30% of land and 30% of oceans by 2030
- zero new extinctions
- real and significant climate action
- working to establish a Nature Repair Market to support landholders to conserve, protect and restore nature.

Tarong West Wind Farm Project is not inconsistent with Australia's obligations under the Convention on Biological Diversity. The Project is a renewable energy project and thus contributes to the transition away from non-renewable energy sources which contribute to climate change. The Project has been designed to minimise impacts to biodiversity. The Project Site is situated in an agricultural landscape, and the clearing footprint has been designed to avoid clearing vegetation as far as possible, to minimise impacts on threatened and migratory species known to occur in the area.

4.6.11.2 Convention on International Trade in Endangered Species of Wild Fauna and Flora

Australia joined the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1976. The Convention regulates the trade in live or dead wild plants and animals for the purposes of conservation (*Convention on International Trade in Endangered Species of Wild Fauna and Flora*, 1973). The proposed Tarong West Wind Farm does not involve the trade, import, or export of wild plants or animals and therefore is not inconsistent with Australia's obligations under CITES.

4.6.12 Conservation plans for threatened species

Avoidance, minimisation, and mitigation measures have been developed based on approved conservation advice and published literature. Table 4-20 demonstrates that the Project is not inconsistent with relevant conservation advice issued for threatened species within the Project Site, excluding greyheaded flying-fox which has no relevant conservation advice.

Table 4-20 Conservation plans for species considered likely or confirmed to occur within the Project Site

Identified threats	Conservation and management priorities/strategies	Tarong West Wind Farm
Conservation advice for Calyptorhynchus lathami lathami (south-eastern glossy black-cockatoo) **(DCCEEW, 2022a)**		
• **inappropriate fire regimes** • **clearing of native vegetation/timber harvesting** • **habitat fragmentation** • **grazing** • **invasive weeds** • **climate change – increased likelihood of extreme events and temporal/spatial shift of resource availability** • **competition for nest hollows** • **psittacine beak and feather disease** • **predation** • **bird and egg collection for illegal wildlife trade.**	• Protect, restore, and enhance the quality of known suitable habitat. • Establish appropriate buffer zones of native forests or woodlands around important nesting areas. • Protect large old trees and smaller trees containing hollows. • Maintain connectivity within and between regions. • Ensure year-round availability of surface water in proximity to foraging and nesting habitat. • Maintain vegetation in proximity to water points. • Identify important populations and engage stakeholders in the development and implementation of a local area management plan. • Promote and encourage revegetation programs to include *Allocasuarina/Casuarina* in planting. • Implement landscape-scale fire management strategies which are sensitive to the needs of the species (e.g. protecting known nesting habitat, etc.) • Identify sites where hollows are limiting and develop and implement strategies to increase hollow availability.	• Clearing of remnant vegetation most likely to contain aged trees with potential breeding hollows has been minimised – only 15.46 ha of remnant vegetation will be removed. • Where nest hollows are unavoidably removed, they will be replaced with nest boxes as a rate of two for every one removed to mitigate impacts. • Revegetation of cleared areas upon decommissioning will include local feed trees where they were present prior to clearing. • The Project Site is currently managed as cattle grazing land by several landowners. A Bushfire Management Plan (refer Appendix L) has been developed to reduce the risk of uncontrolled fire which may damage feeding and breeding habitat. • Climate change: The Project is a renewable energy project and so will contribute to the long term transition away from carbon-generating energy production. • Nest predation by brushtail possums may occur on the Project Site, however the Project is not likely to exacerbate predation by this species. Feral cat and European red fox predation does not appear to be a threat.
Approved conservation advice for Lepidium peregrinum (wandering peppercress) **(DoE, 2014a)**		
• **habitat clearing** • **grazing by rabbits** • **livestock grazing** • **weed invasion.**	• Identify populations of high conservation priority and limit disturbance to species habitat in private and public land. • Develop and implement stock management plan for road verges. • Develop suitable fire management strategy, particularly for known populations. • Raise public and landholder awareness of the species. • Research population recruitment and translocation.	• Extensive field surveys have been conducted and determined that there is limited suitable habitat for wandering peppercress within the Project Site. • Should populations be identified in the Project Site as part of pre-clear surveys, their locations will be reported in a return of operations to the Queensland DETSI. If wandering peppercress is identified outside of the clearing area, they will be clearly marked to avoid accidental damage.

Identified threats	Conservation and management priorities/strategies	Tarong West Wind Farm
	• Identify and remove invasive weeds that could threaten the species.	• A Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) will be implemented to control the spread of invasive species which may threaten the wandering peppercress. • A Bushfire Management Plan (refer Appendix L) will be developed and implemented to reduce the risk of uncontrolled bushfires. • The Project Site is already managed by private landholders as grazing land for cattle. The construction and operation of Tarong West Wind Farm is not likely to cause an appreciable change in how stock and grazing land are managed.
Approved conservation advice for Thesium australe (Austral toadflax) **(DoE, 2013a)**		
• **lack of fire/disturbance.** • **livestock grazing** • **native and feral herbivory** • **infrastructure and agricultural development** • **weed invasion** • **infrastructure maintenance.**	• Identify populations of high conservation priority and limit disturbance to species habitat in private and public land. • Develop and implement stock management plan for road verges. • Develop suitable fire management strategy, particularly for known populations. • Raise public and landholder awareness of the species. • Research population recruitment and translocation. • Identify and remove invasive weeds that could threaten the species.	• Extensive field surveys have been conducted and determined there is limited suitable habitat for Austral toadflax within the Project Site. • Should populations be identified in the Project Site as part of pre-clear surveys, their locations will be reported in a return of operations to the Queensland DESI. If Austral toadflax is identified outside of the clearing area, they will be clearly marked to avoid accidental damage. • A Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) will be implemented to control the spread of invasive species which may threaten the Austral toadflax. • A Bushfire Management Plan (refer Appendix L) will be developed and implemented to reduce the risk of uncontrolled bushfires. • The Project Site is already managed by private landholders as grazing land for cattle. The construction and operation of Tarong West Wind Farm is not likely to cause an appreciable change in how stock and grazing land are managed.

Identified threats	Conservation and management priorities/strategies	Tarong West Wind Farm
***Conservation advice for Phascolarctos cinereus (koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (DAWE, 2022a)**		
• **loss of climatically suitable habitat** • **increased intensity/frequency of drought, heatwaves, and bushfires** • **declining nutritional value of foliage** • **clearing and degradation of koala habitat** • **encounter mortality with vehicles and dogs** • **koala retrovirus (KoRV) and chlamydia (*Chlamydia percorum*).**	• Build and share knowledge on koala habitat use, population dynamics, and threats to the species. • Develop strong community engagement and partnerships for koala habitat protection. • Increase the area of protected koala habitat and improve the condition of existing habitat on private and public land. • Integrate koala conservation in policy, statutory, and land use plans. • Strategically restore habitat. • Actively manage metapopulations taking into account genetics, health, and extreme weather events.	• The proposed Project utilises an area which is already highly fragmented and within a broader agricultural landscape. Koala habitat has been avoided where possible in design and offsets will be provided for residual impacts to koala habitat. • A Fauna Management Plan (Ecosure, 2025c) (refer Appendix G) will be implemented which manages risks to koala associated with construction and operation of the wind farm, including vehicle strike risk, predation by wild dogs, and stress-induced disease. • A Bushfire Management Plan (refer Appendix L) will be implemented which minimises the risk of uncontrolled bushfire causing koala habitat loss. • The Tarong West Wind Farm will not be inconsistent with increasing indigenous Australian, community, and stakeholder participation in koala recovery. Local citizen science initiatives such as the Burnett Koala Program (Burnett Catchment Care Association, 2023) will not experience disruption.
***Conservation advice for Petauroides volans (greater glider (southern and central))* (DCCEEW, 2022b)**		
• **inappropriate fire regimes** • **habitat clearing and fragmentation** • **timber harvesting** • **entanglement in barbed wire fencing** • **hyper-predation by owls.** • **competition from sulphur-crested cockatoos** • **predation by feral cats** • **predation by European red foxes.**	• Implement management measures to reduce risk from future bushfires, and to strategically protect greater glider habitat in fire management. • Protect and maintain sufficient areas of suitable habitat to sustain viable subpopulations. • Protect hollow-bearing trees. • Avoid fragmentation and loss of habitat due to development of new transport corridors. • As a last resort, where hollows are limiting, consider the use of nest boxes and artificial hollows. Monitor these structures to ensure they are utilised.	• The contribution of the Project to landscape fragmentation will be minimal. The area is already a highly fragmented agricultural landscape, with extensive historical levels of clearing. Existing tracks and roads will be upgraded where possible. The species is highly mobile, so the limited extent of clearing is unlikely to cause fragmentation at a level that would impact greater glider. • Feral cats and European red foxes are known to occur on the Project Site. A Construction Environmental Management Plan and Pest Animal Management Plan will be developed to monitor and control fauna pests should populations appear to increase.

Identified threats	Conservation and management priorities/strategies	Tarong West Wind Farm
		• Sulphur-crested cockatoos are abundant on the Project Site. The construction and operation of the wind farm is not likely to cause an increase in abundance of sulphur-crested cockatoos, and any potential greater glider nesting hollows unavoidably removed will be replaced at a rate of two nest boxes for every one hollow removed, to ensure clearing does not lead to increased competition. • A Fauna Management Plan (Ecosure, 2025c) (refer Appendix G) has been developed to manage potential barbed wire fencing entanglement (where fencing requirements allow).
Conservation advice Hirundapus caudacutus White-throated needletail **(Threatened Species Scientific Committee, 2019)**		
• **habitat loss and fragmentation – loss of breeding habitat in northern hemisphere and roosting sites in Australia** • **direct mortality – wind turbines and overhead wires causing direct mortality or presenting a barrier to movement** • **insecticides – decrease in insect populations or secondary poisoning by accumulating sublethal doses.**	• Identify requirements of important habitat in Australia. • Support initiatives to improve habitat management at key sites in Australia.	• Ongoing bird utilisation surveys and spotlighting have been conducted to understand how the species utilises the Project Site. White-throated needletail have only been observed foraging in the air over the Project Site, but potential roosting habitat will be cleared. Clearing of remnant vegetation likely to provide roosting habitat has been minimised through Project design – only 15.46 ha of remnant vegetation will be cleared. • The contribution of the Project to landscape fragmentation will be minimal. The area is already a highly fragmented agricultural landscape, with extensive historical levels of clearing. Existing tracks and roads will be upgraded where possible. The species is highly mobile, so the limited extent of clearing is unlikely to cause fragmentation at a level that would impact white-throated needletail. • A Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) has been developed to provide adaptative management of mortality and the strike risk to the population, including a comparison of annual fatalities against pre-determined significant impact thresholds, during the operational phase. Should fatalities exceed the threshold then an appropriate response and adapting management measures will be implemented.

Identified threats	Conservation and management priorities/strategies	Tarong West Wind Farm
		• The Project Site is already managed by private landholders as grazing land for cattle who may use insecticides as part of their land management practices. However, the construction and operation of Tarong West Wind Farm is not likely to cause an appreciable change in how stock and grazing land are managed across the Project Site.

4.6.13 Recovery plans and threat abatement plans for threatened species

Adopted recovery plans have been developed for both the koala (DAWE, 2022a) and grey-headed flying-fox (DAWE, 2021). There is no recovery plan or threat abatement plan for the greater glider, white-throated needletail, or glossy black-cockatoo. It is recognised that recovery plans are required for the greater glider (DCCEEW, 2022b) and glossy black-cockatoo (DCCEEW, 2022a), but for white-throated needletail the approved conservation advice for the species is considered sufficient (DCCEEW, 2024b).

Austral toadflax and wandering peppercress do not have adopted recovery plans, but are considered in the *Threat abatement plan for competition and land degradation by rabbits* (DoEE, 2016).

Details of the identified threats and recovery objectives for each species are discussed in Table 4-21 and Table 4-22, as well as a discussion of the impacts of the proposed Project in the context of these recovery and threat abatement plans.

Table 4-21 Recovery plans for species considered likely or confirmed to occur in the Project Site

Identified threats	Recovery objectives and performance criteria	Tarong West Wind Farm
National recovery plan for the koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) **(DAWE, 2022b)**		
Threats to koala include: • **climate change – changing rainfall patterns, increasing frequency of drought and heatwaves** • **land use change – loss, modification, and fragmentation of native vegetation** • **native forestry – loss of native vegetation** • **altered fire regimes – increased incidence of extreme fire risk days, causing direct mortality and habitat loss/degradation** • **mortality from dogs and vehicles** • **diseases, including koala chlamydia, koala retrovirus (KoRV), herpesviruses, trypanosomes, and mange.**	**Objective 1A:** The area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised then increased. Performance is assessed by: • koala abundance increases in representative sample of populations by 2032 • area of occupancy of representative sample of populations increases by 2032 • area and quality of refugial habitat for populations primarily threatened by climate change increases by 2032 • total net increase of habitat (excluding offset areas) five-yearly. **Objective 1B:** The area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased. Performance is assessed by: • koala abundance increases in representative sample of populations by 2032 • area of occupancy of representative sample of populations increases by 2032 • total net increase of habitat (excluding offset areas) five-yearly. **Objective 2:** Metapopulation processes are maintained or improved. Performance is assessed by: • indicators of population health (genetic and disease) maintained or improved by 2032 • indicators of ecosystem health maintained or improved by 2032. **Objective 3:** Partners, communities, and individuals have a greater role and capability in listed koala monitoring, conservation and management. Performance is assessed by:	• The proposed Project will clear up to 270.52 ha of Preferred koala habitat (15.46 ha of remnant vegetation 115.2 ha of better quality non-remnant areas and 139.86 ha of low quality potential habitat within non-remnant areas) for construction of infrastructure and tracks. An additional 347.16 ha of modelled Dispersal habitat within non-remnant areas may be impacted. Clearing of vegetation has been minimised. • Cystitis and conjunctivitis have been reported in koalas in the South Burnett Regional Council, both of which are symptoms of koala chlamydia infection (National Koala Monitoring Program, 2024). • **Objective 1:** The stability of the local koala population is not currently known. • **Objective 2:** The proposed Project utilises an area which is already highly fragmented and within a broader agricultural landscape. Remnant vegetation and koala habitat are highly fragmented, and the proposed clearing represents up to 2.7% of the available foraging and breeding (Preferred and General, including low quality) habitats present within the Project Site. • **Objective 3:** The Tarong West Wind Farm will not be inconsistent with increasing indigenous Australian, community, and stakeholder participation in koala recovery. Local citizen science initiatives such as the Burnett Koala Program (Burnett Catchment Care Association, 2023) will not experience disruption.

Identified threats	Recovery objectives and performance criteria	Tarong West Wind Farm
	• increase in indigenous Australian participation in recovery for koala by 2032 • increase in general community participation for koala by 2032 • increase in activity of partners participating in koala recovery.	
***National recovery plan for the grey-headed flying-fox Pteropus poliocephalus* (DAWE, 2021)**		
Threats to grey-headed flying-fox include: • **loss of foraging habitat** • **camp disturbance causing stress and injury** • **mortality from crop management practices** • **heat stress causing mortality** • **entanglement in netting and barbed wire fencing** • **climate change** • **bushfires** • **electrocution on powerlines.**	**Recovery objective 1:** Identify, protect, and increase native foraging habitat that is critical to the survival of the grey-headed flying-fox. Performance is assessed by: • extent of habitat protected under conservation programs increased by at least 500 km² • at least 1000 km² of foraging habitat created or restored. **Recovery objective 2:** Identify, protect, and increase roosting habitat of grey-headed flying-fox camps. Performance is assessed by: • increasing number of protected grey-headed flying-fox camps and condition of camps is improved. **Recovery objective 3:** Determine trends in the grey-headed flying-fox population so as to monitor the species' national distribution habitat use and conservation status. Performance is assessed by: • abundance is determined and population trend is identified as stable or improving by 2029. **Recovery objective 4:** Build community capacity to coexist with flying-foxes and minimise the impacts on urban settlements from new and existing camps while avoiding interventions to move on or relocate entire camps. Performance is assessed by: • improvement in public attitudes towards grey-headed flying-foxes and rate of return of rescued flying-foxes. **Recovery objective 5:** Increase public awareness and understanding of grey-headed flying-foxes and the recovery	• **Recovery objective 1:** The Project will result in clearing of up to 270.51 ha of potential foraging habitat considered critical for the grey-headed flying-fox. • **Recovery objective 2:** Extensive seasonal surveys from 2018 – 2023 have not identified any grey-headed flying-fox camps in the Project Site, the Project is not likely to impact this objective. • **Recovery objective 3:** The proposed Project will not interfere with the national monitoring of population trends of the grey-headed flying-fox. Ongoing monitoring and reporting of grey-headed flying-fox sightings as part of pre-construction and operational monitoring will contribute to the monitoring of grey-headed flying-fox populations and movements. • **Recovery objectives 4, 5, and 6:** The Project Site does not contain any known grey-headed flying-fox camps which may be displaced, and is not located in a highly populated urban area where community attitudes to grey-headed flying-foxes may be impacted. • **Recovery objective 7:** The proposed Project does not involve horticulture and will not involve deliberate destruction of grey-headed flying foxes to mitigate impacts to commercial fruit crops. • **Recovery objective 8:** The proposed Project will not interfere with research activities or prevent research activities in the area. • **Recovery objective 9:** The proposed Project involves the construction of overhead lines and fences. Barbed

Identified threats	Recovery objectives and performance criteria	Tarong West Wind Farm
	program, and involve the community in the recovery program where appropriate. Performance is assessed by: • improvement in public attitudes towards grey-headed flying-foxes and reduction in conflict between people and flying-foxes. **Recovery objective 6:** Improve the management of grey-headed flying-fox camps in areas where interactions with humans is likely. Performance is assessed by: • problematic camps are managed in accordance with the Department's referral guideline. **Recovery objective 7:** Significantly reduce levels of licenced harm to grey-headed flying-foxes associated with commercial horticulture. Performance is assessed by: • increased use of non-lethal methods to protect crops **Recovery objective 8:** Support research activities that will improve the conservation status and management of grey-headed flying-foxes. Performance is assessed by: • improved knowledge of grey-headed flying-fox **Recovery objective 9:** Reduce the impact on grey-headed flying-foxes of electrocution on powerlines, and entanglement in netting and barbed wire. Performance is assessed by: • awareness of the issue is increased, and rates of injury from electrocution or entanglement are reduced.	wire will not be used unless necessary for safety or technical requirements (e.g. preventing access to electrical substations), or landowner agreements (the Project Site is primarily used for cattle grazing and for stock and asset protection barbed wire may be necessary around some infrastructure).

Table 4-22 Threat abatement plan relevant to wandering peppercress and Austral toadflax

Identified threats	Objectives and actions	Tarong West Wind Farm
***Threat abatement plan for competition and land degradation by rabbits* (DoEE, 2016)**		
Rabbits are a widespread threat to Australian fauna and flora. Their impacts to flora include: • **preventing plant regeneration** • **overgrazing and general damage to plant species** • **reversing the normal processes of plant succession** • **altering ecological communities and changing soil structure and nutrient cycling, leading to significant erosion** • **promoting growth of introduced and unpalatable species such as weeds.**	**Objective 1:** Strategically manage rabbits at the landscape scale and suppress rabbit populations to densities below threshold levels in identified priority areas • prioritise areas for their conservation value • develop coordinated management and monitoring programs. **Objective 2:** Improve knowledge and understanding of rabbits and their interactions with other species and ecological processes • continue research to understand how rabbit populations affect feral cat, fox, and wild dog populations • continue research to understand the effects of rabbit presence on weeds and native species. **Objective 3:** Improve the effectiveness of rabbit control programs • develop new methods and biocontrol tools to manage rabbit populations. **Objective 4:** Increase engagement of, and awareness by, the community of the impacts caused by rabbits, and the need for integrated control. • develop training programs to encourage local adoption of control and monitoring methods.	• Rabbits are recorded present at the Project Site, and are known to graze on wandering peppercress (DoE, 2014a) and Austral toadflax (Scarlett, Branwell and Earl, 2003). • A Construction Environmental Management Plan, along with Vegetation and Fauna Management Plans will be developed to control weeds and fauna pests during construction, to reduce the risk of increasing rabbit numbers and spread of weeds impacting wandering peppercress and Austral toadflax. • The proposed Project will not interfere with the objectives of the threat abatement plan. The Project Site is managed as grazing land for cattle, and after construction land owners will be able to continue to conduct feral animal control that is consistent with their land use.

4.7 Impacts to listed migratory species

4.7.1 Guidelines and assessment definitions

The MNES Significant Impact Guidelines (DoE, 2013b) provide criteria to assess whether a proposed action will have, or is likely to have, a significant impact on migratory species. Assessment criteria for species listed as migratory are listed in Table 4-23.

Table 4-23 Significant impact criteria for species listed as migratory

Migratory species
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviours) of an ecologically significant proportion of the population of a migratory species.

The white-throated needletail is listed as both vulnerable and migratory under the EPBC Act. As such, and in accordance with the issued PER guidelines, impact assessment has been conducted for this species under its listing as a threatened species in Section 4.6. Two additional migratory species were considered 'Possible' to occur within the Project Site, oriental cuckoo (*Cuculus optatus*) and glossy ibis (*Plegadis falcinellus*), based on historical records within 20 km of the Project Site and some potentially suitable habitat present on the Project Site. However, the Project is not considered to have a significant impact to these species on the basis of the low likelihood of these species' occurrence (determined from over six years of survey effort across the Project Site) and the limited and/or marginal habitat present to support these species, as such as these species have not been detailed further in this Section 4.7.

4.7.2 Fork-tailed swift

Fork-tailed swifts have only been observed aerially and none were observed roosting across the Project Site. Construction impacts are not considered for this species as the Project Site is highly unlikely to provide roosting habitat, as they forage aerially 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 (Table 4-24). Blade strike issues are assessed and discussed in more detail in Section 4.8 and the BBUS (Ecosure, 2025b) (refer Appendix J). A formal assessment for the fork-tailed swift against EPBC Act migratory criteria is provided in Table 4-25.

Table 4-24 Impacts and mitigation measures for the fork-tailed swift

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
Direct mortality from WTG strike	Impacts will commence upon WTG construction and continue throughout the operational life of the Project (30 – 40 years).	• WTGs sited as far as practicable from remnant vegetation. • Adaptive control program to be implemented in a Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).	The measures are considered effective at managing the effects to fork-tailed swift.
Habitat alienation and barriers to movement	Fork-tailed swift may be alienated from the aerial habitat above the Project Site.	• WTGs sited as far as practicable from remnant vegetation. • Monitoring will be implemented in a Bird and Bat Management	The measures are considered effective at managing the effects to fork-tailed swift.

Potential impact	Detail, timing, and duration of impact	Avoidance, minimisation, and mitigation measures	Effectiveness of measures
		Plan (Ecosure, 2025a) (refer Appendix I).	

4.7.2.1 Significant impact assessment

Table 4-25 EPBC Act significant impact assessment for fork-tailed swift

Significant impact criteria	Assessment of the Project Site
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat	Unlikely. This species does not breed in Australia. (DoE, 2015a) lists important habitat as inland open plains to wooded areas, though it is believed to be exclusively aerial. Fork-tailed swift is a highly mobile species that forages aerially over most habitats, so the clearing footprint is unlikely to significantly reduce or fragment foraging habitat. A threshold level for a nationally significant area of important habitat has not been defined for this species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Unlikely. No invasive species are known to threaten the fork-tailed swift (DoE, 2015a). The proposed Project will not result in the establishment of an invasive species that could harm fork-tailed swifts or their habitat.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	Unlikely. The Project Site does not support an ecologically significant proportion of the population. The species is a highly mobile aerial forager, which is most likely to frequent the Project Site during suitable atmospheric conditions (summer storms) for foraging. This species does not breed in Australia. Construction is unlikely to impact on foraging or roosting habitat, as fork-tailed swift is exclusively aerial, roosting on the wing (DoE, 2015a). Individuals may occasionally collide with WTGs during operation. The risk of collisions will be managed in accordance with an approved Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I), including ongoing monitoring of carcasses, regular review of the strike risk and adapting management measures where possible.
Overall impact assessment	The proposed Project is unlikely to have a significant impact on fork-tailed swift, with the implementation of all practical impact mitigation measures.

4.7.3 International obligations

4.7.3.1 The Bonn Convention

Australia is party to the Bonn Convention, also known as the Convention on the Conservation of Migratory Species of Wild Animals. The Convention is concerned with protection of species which live in or cross national jurisdictional boundaries at any stage of their life cycle (‘Convention on the Conservation of Migratory Species of Wild Animals’, 1979).

The fork-tailed swift is not listed under the Bonn Convention. As a result, the Convention does not apply to this species and the Project will not be inconsistent with Australia’s obligations under the Bonn Convention.

4.7.3.2 Ramsar Convention on Wetlands of International Importance

The Ramsar Convention on Wetlands of International Importance aims to identify and protect wetlands that are internationally significant based on their ecology and hydrology (UNESCO, 1971). The PMST search identified the nearest Ramsar wetland (Narran Lake Nature Reserve) is 500 – 600 km downstream of the proposed Project Site. Project activities will not significantly alter the hydrology of the

Project Site to a level that may impact this Ramsar wetland. Additionally, the Project Site does not contain any natural wetlands, and although waterbirds may use numerous farm dams throughout the Project Site for resting and feeding, these are not considered significant waterbird habitat. The proposed Project will therefore not be inconsistent with Australia's obligations under the Ramsar Convention.

4.7.3.3 Agreement on the Conservation of Albatrosses and Petrels

The objective of the Agreement on the Conservation of Albatrosses and Petrels is broadly to "achieve and maintain a favourable conservation status for albatrosses and petrels" (ACAP, 2018). For parties to the agreement, including Australia, this involves protecting albatross and petrel habitat, managing invasive species which impact albatrosses and petrels, and supporting research and information-sharing programs to enhance knowledge of albatross and petrel species. The proposed Project Site is located approximately 150 km inland from the nearest coast. No albatross or petrel species were sighted during field surveys from 2018 - 2023, and no suitable marine or coastal habitat for albatross or petrel species exists within the Project Site. Therefore, the proposed Project is not inconsistent with the Agreement on the Conservation of Albatrosses and Petrels.

4.7.3.4 East Asian-Australasian Flyway Partnership

The east coast of Australia lies within the East Asian-Australasian Flyway with the closest site being the great Sandy Strait. A site must qualify as an internationally important wetland to be listed in the Flyway Site Network. To qualify a site must meet the following criteria:

- regularly support > 20,000 migratory waterbirds; or,
- regularly support > 1 % of the individuals in a population of one species or subspecies of migratory waterbird; or,
- support appreciable numbers of an endangered or vulnerable population of migratory waterbird
- it is a "staging site" supporting > 5,000 waterbirds, or > 0.25% of a population stage at the site.

The Project Site does not meet these criteria and there are no obligations under this agreement that need to be considered.

4.7.3.5 China-Australia Migratory Bird Agreement

The fork-tailed swift and white-throated needletail are listed under the China-Australia Migratory Bird Agreement (CAMBA). In Article II the agreement stipulates that the taking of migratory birds or their eggs shall be prohibited with limited exceptions in the case of scientific or educational purposes, for the purposes of protecting people or property, or for traditional hunting purposes. In Article IV, the Agreement stipulates that the parties to the agreement shall "seek means to prevent damage to migratory birds and their environment", and to "endeavour to take such measures as may be necessary to restrict or prevent the importation and introduction of animals and plants which are hazardous to the preservation of migratory birds and their environment".

The proposed Project does not involve the taking of migratory birds or their eggs, but both fork-tailed swifts and white-throated needletails may interact with WTGs resulting in mortality. White-throated needletails were sighted in large numbers (n = 364) and fork-tailed swifts were sighted in small numbers (n = 3) at the proposed Project Site. Proposed impact mitigation measures implemented on an ongoing basis under the adaptive Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) are anticipated to reduce the risk of wind turbine collision to these species. Ongoing seasonal bird surveys and carcass monitoring (incorporating carcass persistence trials and observer efficiency trials) will be utilised to monitor mortality rates of the fork-tailed swift and white-throated needletail, and to adjust impact management strategies accordingly. Provided impact mitigation measures are adaptively implemented and monitored to effectively and demonstrably reduce the risk of mortality to these species, the proposed Project is not anticipated to be inconsistent with CAMBA.

4.7.3.6 Japan-Australia Migratory Bird Agreement

The fork-tailed swift and white-throated needletail are listed under the Japan-Australia Migratory Bird Agreement (JAMBA). In Article II the agreement stipulates that the taking of migratory birds or their eggs shall be prohibited with limited exceptions in the case of scientific or educational purposes, for the purposes of protecting people or property, or for traditional hunting purposes. In Article VI, the

agreement stipulates that the parties to the agreement shall “seek means to prevent damage to migratory birds and their environment”, and to “control the importation of animals and plants which it determines to be hazardous to the preservation of such birds”.

The proposed Project does not involve the taking of migratory birds or their eggs, but both fork-tailed swifts and white-throated needletails may interact with WTGs resulting in mortality. White-throated needletails were sighted in large numbers (n = 364) and fork-tailed swifts were sighted in small numbers (n = 3) at the proposed Project Site. Proposed impact mitigation measures, implemented on an ongoing basis under the adaptive Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) are anticipated to reduce the risk of wind turbine collision to these species. Ongoing seasonal bird surveys and carcass monitoring (incorporating carcass persistence trials and observer efficiency trials) will be utilised to monitor mortality rates of the fork-tailed swift and white-throated needletail, and to adjust impact management strategies accordingly. Provided impact mitigation measures are adaptively implemented and monitored to effectively and demonstrably reduce the risk of mortality to these species, the proposed Project is not anticipated to be inconsistent with JAMBA.

4.7.3.7 Republic of Korea-Australia Migratory Bird Agreement

The fork-tailed swift and white-throated needletail are listed under the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA). In Article II the agreement stipulates that the taking of migratory birds or their eggs shall be prohibited with limited exceptions in the case of scientific or educational purposes, for the purposes of protecting people or property, or for traditional hunting purposes. In Article V, the agreement stipulates that the parties to the agreement shall “seek means to prevent damage to such birds and their environment”, and to “endeavour to take measures to control the impact of invasive animals and plants on the conservation of such birds and their environment”.

The proposed Project does not involve the taking of migratory birds or their eggs, but both fork-tailed swifts and white-throated needletails may interact with WTGs resulting in mortality. White-throated needletails were sighted in large numbers (n = 364) and fork-tailed swifts were sighted in small numbers (n = 3) at the proposed Project Site. Proposed impact mitigation measures, implemented on an ongoing basis under the adaptive Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) are anticipated to reduce the risk of wind turbine collision to these species. Ongoing seasonal bird surveys and carcass monitoring (incorporating carcass persistence trials and observer efficiency trials) will be utilised to monitor mortality rates of the fork-tailed swift and white-throated needletail, and to adjust impact management strategies accordingly. Provided impact mitigation measures are adaptively implemented and monitored to effectively and demonstrably reduce the risk of mortality to these species, the proposed Project is not anticipated to be inconsistent with ROKAMBA.

4.7.4 Threat abatement plans

The fork-tailed swift is considered in the *Threat abatement plan for predation by feral cats* (DoE, 2015b). The conservation advice for white-throated needletail has been considered under its listing as a threatened species, in Section 4.6.12. Consideration of the threat abatement plan is provided in Table 4-26.

Table 4-26 Threat abatement plan for predation by feral cats

Identified threats	Objectives and actions of the plan	Justification for Tarong West Wind Farm
Threat abatement plan for predation by feral cats (DoE, 2015b)		
Feral cats are a widespread threat to Australian fauna. Their impacts include: • **direct predation** • **competition with native predators** • **disease transmission.**	**Objective 1:** Effectively control feral cats in different landscapes • prioritise areas for their conservation value • develop and implement cat control measures, and research their effectiveness and efficiency • research into the role of landscape modifiers (e.g. fire, grazing) in exacerbating effects of feral cats. **Objective 2:** Improve effectiveness of existing control options for feral cats • provide landowners and stakeholders with information and resources for best practice feral cat control • prioritize areas for feral cat management and ensure consistent legislation requirements for cat control. **Objective 3:** Develop or maintain alternative strategies for threatened species recovery • establish areas free of feral cats (e.g. islands, fenced areas) for preservation of native species • research disease transmission by cats. **Objective 4:** Increase public support for feral cat management and promote responsible cat ownership • understand transition of domestic to feral cats and develop community education and involvement programs to control domestic and feral cats.	• Feral cats are recorded present within the Project Site. Fork-tailed swifts may be at risk of predation by cats if they come to roost, however the species is almost exclusively aerial in Australia (DoE, 2015a) so the risk of cat predation to this species on the Project Site is low. • A Construction Environmental Management Plan and Pest Animal Management Plan will be developed to manage fauna pests and the risk of attracting fauna pests to the Project Site during construction. • The proposed Project will not interfere with the objectives of the threat abatement plan. The utilisation of the Project Site as a wind farm will not interfere with local feral cat control measures or prevent feral cat control research. The Project Site is managed as grazing land for cattle, and after construction landowners will be able to continue to conduct feral animal control that is consistent with their land use.

4.8 Impacts associated with turbine strike and site utilisation

4.8.1 Bird and bat utilisation survey

A BBUS (Ecosure, 2025b) was prepared to address potential operational bird and bat impacts for the proposed development and prioritises occurrence and susceptibility of species of national and state conservation significance (refer Appendix J). The BBUS (Ecosure, 2025b) provides a detailed description of the methods used to assess the risk of turbine strike and is attached to this PER (refer Appendix J).

The assessment of impacts associated with turbine strike and barotrauma followed the hierarchical approach outlined by Brett Lane & Associates and Aria Professional Services (2005). This approach provides three levels of investigation with each level determining the need for additional investigation:

- Level one:
  - provide a preliminary risk assessment of significant impacts to birds and bats
  - determine if proposed mitigation measures are likely to minimise the risk to all bird and bats to low risk
  - determine if further investigations are required
  - identify target bird and bat groups or species to be considered during any subsequent site surveys or monitoring.
- Level two:
  - provide a refined estimate of risk to birds and bats
  - increase knowledge of bird and bat occurrence across the Project Site (e.g. seasonal surveys)
  - assess the magnitude of the potential or actual direct and indirect impacts on birds and bats
  - identify questions to be addressed by further investigations and document operational phase impact monitoring.
- Level three:
  - refine the risk assessment in the context of the regional or wider population of birds
  - inform wind farm feasibility, design and operational measures sufficient to achieve acceptable levels of bird mortality risk.

The BBUS (Ecosure, 2025b) (refer Appendix J):

- compiled bird and bat data for the Project Site including:
  - species diversity
  - occurrence of conservation significant species
  - critical fauna resource habitats within turbine footprints and adjacent areas.
- assessed risk to birds and bats including:
  - species susceptible to collision
  - qualitative and semi-quantitative estimate of risk.
- recommended risk mitigation measures
- details of 24 months continuous seasonal bird utilisation surveys
- collision risk modelling
- determine the residual risk to birds and bats
- recommended further investigations and monitoring.

The bird utilisation surveys between 2018 and 2023, targeted resident threatened aerial species, resident raptors and nomadic and migratory species that are likely to fly over the Project Site. Date was

captured related to species, number, location, habitat, altitude, behaviour and flight paths. Searches were undertaken for nocturnal bird species and bats. This information is the first step in a 'Before – After – Control – Impact' ('BACI') design which allows a comparison of bird use at the Project Site (and reference sites) before (pre-construction phase) and after (operational phase) the Project commences.

Surveys detected 189 identified native bird species and 19 identified bat species, plus an additional 15 unidentified bird species (by sighting or call) and six unidentified bat species (by acoustic recording). Three MNES were identified on the Project Site through a variety of survey methods, glossy blackcock-atoo, white-throated needletail, and grey-headed flying-fox. One migratory species was identified on-site, the fork-tailed swift. The available habitats within the Project Site and details of each species site use is detailed further in Chapter 3 of the PER, along with the supporting Bird and Bat Management Plan (Ecosure, 2025a) and BBUS (Ecosure, 2025b) (Appendix I and Appendix J).

4.8.2 Level one risk assessment

The probability (likelihood) of an impact for a species was based on the likelihood of occurrence at the Project Site and the height at which a species is known to fly. Table 4-27 provides a probability scoring matrix (high, medium, low) based on species occurrence and flight height criteria.

Table 4-27 Probability matrix for risk of collision

Probability	Occurrence	Flight height
High	Reside / regularly traverse site	Regularly fly at RSA height
Medium	Reside / regularly traverse site	Occasionally fly at RSA height
	Rarely traverse site	Regularly fly at RSA height
Low	Reside / regularly traverse site	Rarely to never fly at RSA height
	Unlikely to occur	Not applicable

A probability of collision for bird and bat groups was assigned based on species' known flight behaviour (e.g. flight height, flight distance, vigilance), heights, and preferred habitat was completed for species known or considered likely to use the Project Site, including microbats and flying-foxes. Each group has been assigned a qualitative risk category of high, medium, or low probability of collision with Project infrastructure, including WTG blades.

The concept WTG design allows for a structure up to 190 m tall (hub height) with up to 90 m blades. The RSA is therefore approximately 26,015 m² in area. Blades will sweep a diameter of approximately 180 m with a minimum height of 65 m and maximum height of 280 m above ground level. Given that vegetation within the Project Site has a canopy height of up to 20 m (generally 16-18 m), there will be approximately 45 m of unencumbered airspace between the canopy and the blades.

Birds (and bats) will be at risk when flying:

- within the RSA from 65 m to 280 m above ground level.
- within an additional barotrauma area generated by the blades (assumed to be 25 m).

As the WTG design and speed is currently unknown this barotrauma area cannot be calculated. Although barotrauma effects are not explicitly assessed in the qualitative assessment table, they are incorporated into the risk assessment by including a 25 m buffer around the upper (280 m) and lower (65 m) blade swept heights, which results is an RSA assessment between 40 m and 305 m.

The probability of collision with a turbine is higher for those species that fly well above the canopy level and those species that soar across all levels of airspace. If the operation of WTG results in bird mortality, scavenger species (e.g. wedge-tailed eagles, black-breasted buzzard, etc) may potentially be drawn to the animal carcasses at the base of WTGs. This scavenging behaviour has the potential to increase the risk of injury or mortality from blade strike.

The BBUS determined that species groups considered at high risk of collision with WTG include aerial foragers (including listed threatened and migratory species), raptors, cockatoos (excluding glossy black-

cockatoo), microbats that forage above the canopy, flying-foxes and wetland birds (including listed migratory species).

4.8.3 Level two risk assessment

The collision risk modelling assessed the risk based on various models, finding Stochlab's band model most appropriate for the Project. StochLab's *mig_stoch_crm* was used to estimate mortality per migratory season (September to February) for populations of white-throated needletails and fork-tailed swifts (at 95%, 99% and 99.9% avoidance rates).

Mortality rates differed depending on avoidance rate and population size for both white-throated needletail and fork-tailed swift. Based on the bird utilisation surveys the population per season considered representative of the Project Site is 1,000 individual white-throated needletail and 500 fork-tailed swift.

Mortality rates for a population size of 1,000 white-throated needletails (per season), ranged from 0.012 (99.9% avoidance) to 0.612 (95% avoidance) individuals per migratory season (refer Appendix J). A conservative population size of 500 fork-tailed swifts (per season) results in a mortality estimate of 0.006 (99.9% avoidance) to 0.299 (95% avoidance) birds per migratory season (refer Appendix J).

Given the sources of uncertainty present in mathematical collision risk modelling, and the lack of empirical data informing avoidance rates in particular, the results of collision risk model must be interpreted in the context of what is known about the biology of the species and the way they are observed to interact with WTGs. While it is difficult to exactly quantify the unmitigated risk to species of concern (as demonstrated by the difference in collision estimates depending on method used and assumed avoidance rate), these collision risk models demonstrate that for the Project, white-throated needletails are the conservation significant species that is most at risk from unmitigated impact due to wind turbine collision. Fork-tailed swifts are also at risk of collision, but at a much lower level relatively as they have been observed utilising the Project Site infrequently and in much lower numbers than the white-throated needletail.

4.8.4 BBUS assumptions, uncertainties, and limitations

Limitation associated with the BBUS field surveys are identified in detail in the BBUS (Ecosure, 2025b) (refer Appendix J) and summarised here:

- The refinement of Project design, including rationalisation of the site layout to avoid and minimise impacts throughout the development phase has resulted in some changes to survey design over that period. In particular, changes to the impact and reference site locations for fixed point utilisation surveys.
- Data gained from database searches and used in the desktop components of this assessment have caveats regarding the robustness or completeness of the information.
- Targeted surveys can confirm the presence of a particular fauna species from a given area but cannot confirm the absence of a species and species detectability may be affected by factors outside the control of survey design, (e.g. climate and cyclical variations).
- Data collected in the fixed-point count surveys are intended to be used to estimate risk of collision by taking into account species flight behaviours and air space usage within the Project Site. Sightings of birds recorded over the course of each survey give a general indication of bird utilisation and abundance and frequency of occurrence of each species. The total number of sightings does not necessarily equal an equivalent number of individual birds, as repeated sightings of the same individuals may occur particularly if nests are present or food is abundant. Repeated sightings are valuable for understanding bird utilisation in the Project Site but must be kept in context when considering estimates of the number of individual birds which may experience impacts from the Project.
- The surveys were not possible to habitat ground-truth to a fine scale all mapped remnant, HVR and non-remnant vegetation due to Project Site size and some access constraints. Flora surveys were based on the WTG positions and Project planning corridor available at the time of survey. In these areas, surveys conducted nearby in similar vegetation, previous survey data, satellite imagery and desktop mapping were used to classify vegetation. A combination of survey results and desktop information was also used to develop habitat models for threatened species.

4.8.5 High-risk turbines

The collision risk assessment determined that white-throated needletail is a high risk of operational impacts, as the species has been detected on multiple occasions in large flocks during the migratory season, and regularly within the RSA (refer Appendix J). White-throated needletail display a high degree of mobility, which was considered in the collision risk model determining that dependent on the avoidance rate, mortality estimates vary between 0.012 (99.9% avoidance) to 0.612 (95% avoidance) individuals per migratory season. Based on this assessment and that white-throated needletails were recorded aerially across the Project Site, all WTGs have been determined to present equal risk to white-throated needletails (determined as high collision risk in the BBUS) for inclusion in the operational monitoring and adaptive management as detailed in the Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I).

A flight path assessment was completed using the direction of flight of conservation significant bird species and large raptor species recorded during fixed point count surveys. The results of the flight path assessment do not identify a defined flight path across the Project Site and highlight that the Project Site is used variably by both conservation significant and raptor species. The data currently available, are unable to highlight turbines that are of high-risk.

4.8.6 Collision risk summary

The results of the BBUS (Ecosure, 2025b) assessment of risk to MNES known to occur on Project Site, based on behaviours and use of habitats across the area, are presented in Table 4-28 (refer Appendix J). Collision risk assessment concluded that without mitigating measures the glossy black-cockatoo and fork-tailed swift have a medium risk of collision with WTGs, and white-throated needletail and grey-headed flying-fox have a high risk of collision with WTGs.

Table 4-28 Collision risk assessment for EPBC Act-listed species

Species	Site use and flight behaviour	Impact	Probability of collision	Probability of impact to a population/important population	Justification
white-throated needletail (vulnerable and migratory)	White-throated needletails have been observed across 25 occasions from 2018 to 2023 foraging aerially within the Project Site, typically occurring ahead of approaching storm fronts where insects are likely to be abundant on updrafts (Threatened Species Scientific Committee, 2019) The species was not observed roosting in the Project Site. The majority of individual sightings (n = 363) occurred during fixed point count surveys, and one individual was observed opportunistically during a dam survey. All sightings were made during spring and summer surveys, during the migratory season for the species. Migration into eastern Australia from breeding grounds in the Northern Hemisphere typically begins in September and migration out of Australia occurs in March/April (Threatened Species Scientific Committee, 2019). Average recorded flight height within the Project Site was 115 m and maximum recorded height was 200 m, within the RSA of 65 to 280 m.	• collision with WTG causing direct mortality (Threatened Species Scientific Committee, 2019) • loss of potential roosting habitat.	High	High	White-throated needletails display high-risk flight behaviours, flying regularly at RSA height and occurring regularly on the Project Site during spring and summer. Both a nationally (10 individuals) and internationally (100 individuals) important population have been observed over the Project Site. Collision risk modelling identifies a small number of white-throated needletail individuals may collide with WTGs during operation annually dependent on the avoidance rate, ranging from 0.012 (99.9% avoidance) to 0.612 (95% avoidance) individuals per migratory season (refer Appendix J).
grey-headed flying-fox (vulnerable)	Grey-headed flying-foxes have been observed foraging within and adjacent to the Project Site during the spring 2021 fauna surveys. Approximately 12 in total were observed foraging, and the species was not observed in flight. The nearest known grey-headed flying-fox camp is 38 km southeast of the Project Site near Cooyar. In 2018 the camp was estimated to contain 10,000 - 16,000 grey-headed flying-foxes and most recently	• collision with WTG causing direct mortality • loss of foraging habitat.	High	Medium	Grey-headed flying-fox is known to regularly fly at RSA height, but have only occasionally been recorded within the Project Site.

Species	Site use and flight behaviour	Impact	Probability of collision	Probability of impact to a population/important population	Justification
	in 2022 the camp was estimated to contain 500 – 2,500 individuals.				
south-eastern glossy black-cockatoo (vulnerable)	Surveys confirmed seven sightings of glossy black-cockatoo, two individuals were observed circling a dam and perching in the canopy in the spring 2021 surveys. During 2022 two individuals were heard flying above the canopy and during 2023 three individuals were observed flying just above the canopy at approximately 20 m height. Feeding signs (chewings / orts) of glossy black-cockatoo were detected at 21 locations within and adjacent the Project Site. Suitable foraging habitat exists in small patches of *Allocasuarina torulosa*, *A. littoralis, A. luehmannii* and *Casuarina cunninghamiana* amongst forest and woodland communities across the Project Site. Large hollow-bearing trees in remnant REs may provide nesting resources, however, no nesting was observed within the Project Site. Glossy black-cockatoos require tree hollows, positioned 10 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).No specific observations were made of hollows that met these requirements.	• habitat alienation around WTGs • loss of nesting hollows • potential for WTG collision.	Medium	Low	Glossy black-cockatoos are considered to rarely fly at RSA height (likely only when traversing long distances), but have only been recorded at low numbers within the Project Site.
fork-tailed swift (migratory)	Three fork-tailed swifts were observed foraging aerially above the Project Site across 2 occasions in the 2023 summer and spring surveys. Individuals were sighted in association with larger flocks of	• collision with WTG causing direct mortality.	Medium	Low	Fork-tailed swifts display high-risk flight behaviours, flying regularly at RSA height, but are only rarely recorded within the Project Site.

Species	Site use and flight behaviour	Impact	Probability of collision	Probability of impact to a population/important population	Justification
	white-throated needletails on both occasions and were not observed to roost within the Project Site. The species is not known to roost in Australia (DoE, 2015a). The average recorded flight height was 80 m and the maximum recorded flight height was 100 m, within the RSA of 65 to 280 m.				

4.9 Cumulative impacts

4.9.1 Other renewable energy projects in the Wide Bay Burnett region

The Project may need to compete for labour, accommodation and other resources with other proposed major infrastructure projects in the local area. Identified projects are included in Table 4-29.

It is important to note that the expected year of completion is subject to change, however there may be some overlap with other projects. This may lead to competition for labour, accommodation and Project services. The Proponent will monitor these demands and communicate with local suppliers via the established channels.

Table 4-29 Surrounding area major energy projects

Project name	Capacity	WTGs	Est. year of completion	Approx. Distance from Project (km)	Local Government Area	Project Area
Coopers Gap Wind Farm	Up to 460 MW	123	2020	10 km	South Burnett Regional Council & Western Downs Regional Council	Study Area – 10,200 ha Project Construction Footprint – 360 ha Operational Footprint – 100 ha
Wambo Wind Farm	500 MW & 50 MW / 200 MW of battery storage	110	2026	22 km	Western Downs Regional Council	Study Area – 12,760 ha Development Footprint – 372 ha

4.9.2 Habitat loss

The following list details the total ground level disturbance from projects within the scope of this assessment and detailed in Table 4-30 (including Tarong West Wind Farm) for species of interest. The habitat loss associated with Coopers Gap Wind Farm and Wambo Wind Farm must consider that the assessment and approvals preceded the listing of the koala as endangered under the EPBC Act, and many species impact guidelines and conservation advice currently set a lower threshold for a significant of impact on these species.

Table 4-30 Surrounding area habitat loss associated with major energy projects

Species	Coopers Gap Wind Farm (declared not a controlled action in 2011, approved by the State Coordinator-General in March 2017)	Wambo Wind Farm (assessed via Preliminary Documentation and approved December 2021)	Tarong West Wind Farm
koala	Maximum 354 ha suitable habitat	Maximum 30 ha of Koala Habitat within the Project Site	15.46 ha preferred area 115.2 ha general area 139.86 ha of general (low quality) area 347.16 ha dispersal area
greater glider	No listed impact area	Maximum 30 ha of Greater Glider Habitat within the Project Site	15.46 ha preferred area 112.08 ha potential and future habitat area 142.58 ha dispersal area
grey headed flying-fox	No listed impact area	No listed impact area	270.51 ha foraging area

Species	Coopers Gap Wind Farm (declared not a controlled action in 2011, approved by the State Coordinator-General in March 2017)	Wambo Wind Farm (assessed via Preliminary Documentation and approved December 2021)	Tarong West Wind Farm
white-throated needletail	No listed impact area	No listed impact area	15.46 ha
glossy black-cockatoo	No listed impact area	No listed impact area	15.46 ha foraging area 72.4 ha (108 trees) modelled breeding area
fork-tailed swift	No listed impact area	No listed impact area	No habitat impact

All aerial species listed above may also be impacted by one or more wind farms in addition to the Project, Coopers Gap and Wambo Wind Farms across the species geographic range. The list below notes the relevant geographic areas in which cumulative effects may occur:

- grey-headed flying-fox – central Queensland south to Victoria, coastal
- glossy black-cockatoo – southern Queensland to New South Wales, from the coast to along Great Dividing Range and out to the Riverina region in New South Wales
- white-throated needletail – all of Queensland, primarily coastal
- fork-tailed swift – all of Queensland.

Management measures implemented at Tarong West Wind Farm to manage the potential cumulative effects of habitat loss, include:

- reduction in Tarong West Wind Farm clearing footprint
- micro-siting in the clearing footprint to avoid significant environmental values where possible
- implementation of management plans designed to minimise impacts to biodiversity values and ensure that any impacts are contained within the Project Site, including the Fauna Management Plan (Ecosure, 2025c) (refer Appendix G), Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H), Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) and Environmental Management Plan (refer Appendix M).

4.9.3 Habitat fragmentation

The design changes over time for the footprint in Tarong West Wind Farm have resulted in minimal fragmentation to the existing vegetation on-site or within the state and regional corridors.

From a cumulative perspective, each of the projects detailed in Table 4-29 are likely to contribute to some degree of fragmentation and edge effects. Tarong West Wind Farm is located within an existing relatively highly fragmented rural landscape, with a Queensland terrestrial fauna corridor intersecting the south western corner of the Project Site. However, this corridor has been avoided and there is no Project infrastructure present within this corridor. The vegetation in this corridor is important for maintaining viable biodiversity connections to the greater landscape. This terrestrial corridor connects Bunya Mountains National Park in the south with Diamondy, Nudley and Barakula State Forests in the west. The Coopers Gap Wind Farm, which has been constructed to the south of the Project Site, is located within this corridor.

Furthermore, three regionally significant riparian corridors intersect the Project Site. These corridors are within the Boyne River catchment, which flow into the Stuart River and ultimately the Burnett River. Although crossings of one of these corridors is required no WTG infrastructure is located within these corridors. There are several areas of these riparian corridors that are unvegetated throughout and adjacent to the Project Site, creating an already disconnected and fragmented corridor.

A landscape fragmentation and connectivity assessment was completed using DETSI's Landscape Fragmentation and Connectivity (LFC) tool. The Project Site occurs within a highly fragmented region

with remnant and HVR regrowth occurring within generally small and discontinuous patches. Clearing for WTG construction pads and access tracks will cause minor decreases in connectivity of existing vegetation patches and minor fragmentation of fauna movement corridors on the Project Site.

The LFC tool is used as a guide to determine whether a proposed impact from a prescribed activity is likely to significantly impact connectivity The LFC tool uses a GIS based script that calculates the quantum of the proposed impact on connectivity values such as size and configuration of impacted polygons with respect to the Queensland Environmental Offset Framework. Significance is determined by assessing whether the change in the core ecosystem extent at the local scale is greater than a threshold determined by the level of fragmentation at the regional scale, or if any core area is lost or reduced to patch fragments (core to non-core). If the outcome of either is true, then the overall impact is significant. The tool identified that the proposed clearing would result in a 0.83% reduction in core areas at the local scale and no reduction in the number of core remnant areas, and therefore concluded that impact on connectivity areas was not significant.

In addition to the LFC tool, an assessment was completed for existing barriers in the Project Site (refer Section 4.6.9.1) between vegetation patches where gaps exceeded the maximum gliding distance in both directions for greater gliders. This process was done prior to considering the clearing footprint in order to determine pre-existing dispersal barriers. Most of these barriers occur in the north west and southern sections of the Project Site and are reflective of the land practices in these areas where increased land clearing has resulted in highly fragmented habitat.

An assessment for additional gliding barriers created by the Project (pre-mitigated barriers) and maintained connection points (where retention of tall trees adjacent to the clearing footprint will maintain a suitable glide distance and a connection point across the clearing footprint) was determined by clipping the greater glider habitat to the edge of the clearing footprint and intersecting the tree height data to the remaining greater glider habitat (outside of the clearing footprint). This tree height data (outside the clearing footprint) was used to identify areas where the clearing footprint is greater (for barriers) or smaller (for connection points) than the possible glide distance determined from the adjacent tree height data within the adjacent habitat patch. This assessment considered areas of existing landscape barriers across the Project Site, patches below 3 ha, habitat quality (Preferred versus Potential versus Dispersal habitat), confirmed species observations and connectivity to adjacent unverified vegetated areas outside of the Project Site. All pre-mitigated barriers have been mitigated (refer to Section 4.6.9.1) and the assessment concluded there will be no significant impact on habitat fragmentation for the greater glider.

4.9.4 Turbine strike

As detailed in the Bird and Bat Utilisation Study (Ecosure, 2025b) (refer Appendix J), species that may be at risk from turbine strike at Tarong West Wind Farm, and their distribution throughout the broader region include:

- grey headed flying-fox – coastal belt, central Queensland south to Victoria
- glossy black-cockatoo - southern Queensland to New South Wales, from the coast to along Great Dividing Range and out to the Riverina region in New South Wales
- white-throated needletail – all of Queensland, primarily coastal
- fork-tailed swift – all of Queensland.

Given the proximity to Tarong West Wind Farm and the species distribution, it is likely that these species are also likely to occur within the aerial space of Wambo Wind Farm and Coopers Gap Wind Farm. Coopers Gap Wind Farm is operational and has been subject to an adaptative management plan, however the results of any ongoing monitoring is not publicly available for consideration here.

These three wind farms together will result in a maximum of 330 WTGs located within a study area radius of 41,025 ha, which may result in a barrier to these aerial species. Evidence of disruption to flight paths is limited in the literature, but migratory birds are considered to be most at risk from this impact, as they may be forced to burn extra energy reserves diverting their route. White-throated needletail and fork-tailed swift are the key migratory species at RSA height that occur at Tarong West Wind Farm and may also interact with the other wind farms in the area. Monitoring for the presence of cumulative effects is best conducted at a broader scale with individual projects contributing to large-scale

monitoring effects coordinated by species specialist groups outside of this Project. To date no such monitoring programme has been established and Coopers Gap monitoring is not currently available for consideration.

To mitigate the impacts of barrier effects it has been recommended to maintain corridors between wind farms to provide passage to these species. The spacing between the three projects varies, however generally Tarong West Wind Farm is located 10 km from Coopers Gap Wind Farm and 22 km from Wambo Wind Farm providing a corridor between each wind farm. The spacing between Tarong West and Coopers Gap Wind Farms at the southern boundary of Tarong West is approximately 3.4 km, providing a corridor for safe passage between the two projects.

An adaptive Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I) will be implemented at Tarong West Wind Farm to ensure impacts to turbine strike are implemented if they are required.

4.9.5 Sedimentation and run-off

The Project Site is within the Burnett River Catchment and is intersected by the Boyne River, Jumma Creek, Mannuem Creek, Middle Creek, Ironpot Creek and Boughyard Creek. Ironpot Creek and Boughyard Creek flow into the Boyne River which then discharges to the Burnett River.

The projects in the surrounding area described in Table 4-31 do not share the same catchment area as Tarong West Wind Farm. However, the operational Coopers Gap Wind Farm is also intersected by Ironpot Creek and Boughyard Creek within the Burnett River Catchment. Wambo Wind Farm is hydrologically separate and is not considered further in the following study.

An overview of the potential impacts and mitigation measures associated with Tarong West Wind Farm and Coopers Gap Wind Farm is provided in Table 4-31 below. An Erosion and Sediment Control Plan is provided in Appendix N.

Table 4-31 Sedimentation and run-off cumulative impact assessment

Aspect	Tarong West Wind Farm	Coopers Gap Wind Farm
Stormwater run-off	Potential operational impacts include stormwater flows from hardstand and disturbed areas. This will be mitigated through the management of the permanent stormwater network, including ongoing inspection, monitoring, cleaning and, if necessary, remediation.	Potential operational impacts include stormwater runoff from impervious surfaces increasing flow and resulting in downstream flooding and changes in stream geomorphology and aquatic habitat quality. Mitigation measures are not considered necessary due to the small volume discharged in the context of the receiving environment catchments. There will be no formal infrastructure on-site for directing stormwater discharges. Stormwater will be discharged diffusely across the Project Site (predominantly via vegetated surfaces), which will assist in reducing any impacts to water quality and geomorphology.
Waterways and drainage pathways	During construction the most significant risks are associated with the proposed access tracks, which have the potential to impact existing drainage paths and waterways. This will be managed by undertaking ESC works in accordance with the Construction ESCP as follows: • ensuring pre-clearing works are instated • maintaining erosion and sediment control measures • inspecting adjacent drainage paths and waterways for any developing erosion issues	Operational impacts include: • restriction of the passage of fish caused by waterway crossings, both upstream and downstream, by increasing flow velocities at waterway crossings. • restriction of flow caused by waterway crossings resulting in upstream flooding • discharge of water-borne sediments and associated contaminants from stream bank erosion and scouring resulting in adverse impacts on receiving environment surface water quality

Aspect	Tarong West Wind Farm	Coopers Gap Wind Farm
	• ensuring ESC measures are in place until a stable non-eroding landform has been achieved, as detailed in the ESCP • removal of temporary ESC measures. During operation an Operations ESCP will be in place with the following mitigation measures: • management of road pavement surfaces, hardstand areas and batter slopes • monitoring of drainage paths in proximity to site infrastructure, and remedial works, if required.	This will be mitigated by constructing waterway crossings according to relevant industry practice, guidelines and standards. In addition, an operational management plan has been developed for the Project Site which details methods for minimising sediment-laden runoff in accordance with relevant practice guidelines.

Sedimentation and run-off impacts on the Burnett River catchment area as a result of construction and operational activities from Tarong West Wind Farm and Coopers Gap Wind Farm are considered negligible and are not likely to contribute to significant cumulative impacts.

Section 5.0
Proposed avoidance, minimisation and mitigation management measures

Proposed avoidance, minimisation and mitigation management measures

This section presents the avoidance, mitigation, and management measures committed to by the proponent to reduce impacts on MNES identified as occurring within the Project Site. Measures have been developed to meet the 'S.M.A.R.T' principle:

- S – specific (what and how)
- M – measurable (supported by baseline information, and quantifiable/auditable)
- A – achievable (with consideration of timeframe, budget, and personnel required)
- R – relevant (consistent with conservation advice, recovery plans, threat abatement plans, and scientific literature)
- T – time-bound (specific timeframe and frequency).

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.

5.1 Avoidance of impacts

5.1.1 Design phase

During Project development between 2018 to 2024, the size and scope of the Project has changed in response to various considerations and constraints, with a focus on avoidance of ecological impacts where possible, in particular avoiding clearing of potential koala habitat (Table 5-1). An overview of the changes to Project design and evolution is provided in Section 1. Changes made throughout the development include an overall reduction in number of WTGs as follows:

- 151 WTGs in 2018
- reduced to 128 WTGs in 2022
- reduced to 97 WTGs in 2023
- 97 WTG layout further refined following 30% detailed designs, as presented in this PER.

Other changes made involve the exclusion of particular properties to avoid ecological impact, and changes in the scope and configuration of required supporting infrastructure.

Significant changes include removal of two properties containing significant areas of remnant vegetation, including Lot 42 on FTZ37338 (1,219.8 ha), which contains two patches of potential semi-evergreen vine thicket (SEVT) threatened ecological community (TEC) and Lot 65 on BO190 (418.3 ha). Additionally, two extra properties (Lot 2 on 9BO243, Lot 64 on BO190) were added during the Project development. Project design changes have influenced the methods and coverage of subsequent field surveys throughout the Project's development. This PER has considered and assessed a 97 WTG layout, as provided by the proponent in October 2024.

Where possible, the Project has been designed to make use of existing infrastructure. Existing roads and tracks will be used and upgraded where possible, as opposed to constructing new roads and infrastructure will be sited within existing cleared areas to reduce the need for further clearing. In addition, connection to the existing electricity network will occur via an existing Powerlink 275 kilovolt (kV) transmission line (Calvale to Halys) which bisects the Project Site.

Table 5-1 Design iterations for Tarong West Wind Farm

Date	Description	WTGs proposed	Project Site (ha)	Proposed clearing footprint (impact area, ha)	Potential koala impact (ha)	Comments
May 2020	151 WTG layout	151	19,000	1,965	371.83	Early development layout.
May 2022	128 WTG layout	128	17,496	1,615	293.31	Infrastructure layout refined based on reduction of WTGs. Site boundary changed to exclude large areas of remnant vegetation from the Project Site and areas of high glider prevalence along the Kingaroy Burrandowan Road (37 glider sightings occurred in vegetation adjacent to the Project Site area along Kingaroy Burrandowan Road and in properties now excluded from the Project Site, in habitat identical to that occurring in the Project Site).
July 2023	97 WTG layout	97	17,496	1,062	16.98 remnant and 169.05 modelled non-remnant (total 186.03)	Infrastructure refined based on reduction of WTGs and a reduced clearing footprint. Minimising impacts to areas of remnant vegetation and modelled fauna habitat, particularly koala habitat which reduced by approximately 50% since initial design.
October 2024	97 WTG layout	97	17,496	872	15.46 of remnant and 115.2 of general non-remnant, 139.86 of general (low quality) non-remnant (total 270.52)	Refined location of WTGs, access tracks and supporting infrastructure following 30% design details. Removal of BESS. Reduced clearing footprint, minimising clearing impacts to remnant vegetation and non-remnant woodland areas.
April 2025	97 WTG layout	97	17,496	872		Reduced planning corridor to reflect land no longer subject to potential or confirmed impacts. Updated species habitat model to include sparse habitat to support the koala through functional dispersal ecology.

Avoidance of impacts on MNES values has been achieved by siting infrastructure away from identified values. This includes the placement of WTGs and tracks away from regulated vegetation and watercourses as far as possible. As detailed design is finalised, micro-siting of infrastructure within the clearing footprint will be implemented to avoid important habitat features such as hollow-bearing trees and food trees.

The extent of the Project Site was reduced during Project redesign to avoid large patches of remnant and HVR vegetation to the east of the Project Site. The current planning corridor will avoid the largest, most intact patches of vegetation along the eastern boundary and in the north west section of the Project Site. The current design will remove up to a maximum of 15.46 ha of ground-truthed remnant and HVR vegetation. This clearing represents 0.95% of the total remnant and HVR vegetation in the Project Site. No TECs will be cleared or disturbed by the proposed development. As the Project design progressed, all practicable efforts were made to avoid impacts to vegetation communities and fauna habitats, including seasonal impacts 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.

5.1.2 Pre-construction

Pre-clearance surveys will be completed at several stages before and during (as required) construction, in accordance with the Vegetation (Ecosure, 2025e) and Fauna Management Plans (Ecosure, 2025c) (refer Appendix G and Appendix H). 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:
- pre-clear surveys and assessments to identify the potential presence of threatened flora and fauna within all significant habitats to be disturbed
- these can occur months before any clearing or construction commences (e.g. to inform the infrastructure micro-siting and clearing process) and generally cover the area proposed to be disturbed as well as a buffer to allow micro-siting of infrastructure to occur to avoid impacts
- details include:
    - 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 identify if any protected plants are within the clearing footprint by walking proposed clearing areas within potential habitat areas searching for conservation significant plants
    - will be completed by a suitably qualified ecologist.
- pre-clear survey:
    - surveys and assessments to identify the presence of constraints and sensitive areas (including flora and fauna, threatened and otherwise) within a proposed clearing footprint and vicinity
    - generally undertaken in two stages with a first pre-clear survey within about seven days prior to clearing, but no later than 24 hours prior to clearing and a second pre-clear survey immediately prior to clearing
    - first pre-clear surveys identify and mark potential animal breeding places and hollow-bearing trees and flag exclusion areas or no-go zones (including tree protection zones)

  - second pre-clear surveys identify if fauna is present that needs to be left in-situ and avoided, or relocated, whether habitat trees, breeding or foraging places are being utilised, or identify if there are other features that need to be retained and or works rescheduled.
- first pre-clear survey details include:
  - 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 details include:
  - 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.
- fauna spotter-catching:
  - fauna spotter catchers will be present during all 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. Prior to clearing commencing fauna spotter-catchers will check habitat for presence of fauna, manage works to accommodate fauna dispersal, relocate fauna prior to clearing if necessary and take eggs or young permitted to be removed to a qualified carer if required.

All works will be completed by suitably qualified ecologists and fauna spotter catchers.

5.2 Minimisation of impacts

Where avoidance of an impact is not possible, impacts may be minimised by redesign and/or relocation of infrastructure or adopting low impact construction methods. Impacts to ecological values may be minimised through various strategies outlined in the following sections.

5.2.1 Siting

The following will be implemented across the Project to minimise impacts on significant flora and fauna habitats and threatened species:

- siting of infrastructure in areas that have already been cleared or on the edge of vegetation patches to reduce fragmentation and reduce the risk of placing wind turbines in high thoroughfare areas.
- micro-site WTGs using engineering solutions where available to maximise separation from the edges of remnant vegetation.
- WTGs and tracks have been situated away from regulated vegetation and watercourses as far as practicable to reduce the risk of placing wind turbines in high thoroughfare areas.
- maintain the RSA at a height no less than 65 m above the ground, to reduce the risk of WTG collision for species which usually fly at canopy height.
- transmission lines will be kept to below 34 m in height, providing clear and collision risk free airspace between 34 – 65 m (lower WTG blade tip height).
- micro-site the location of access tracks and other infrastructure within the planning corridor based on the results of pre-clear surveys, reconfiguring infrastructure to minimise the amount of vegetation impacted (e.g. elongating pad dimensions may be possible on some sites).

- low wind speed curtailment when wind speeds are between 0 – 3 ms^{-1}.
- 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 topsoil 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, to retain soil structure and prevent erosion.
- where engineering allows, large hollow-bearing trees that provide important denning/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 and where attention to micro-siting is required.

5.2.2 Access track design and construction

The following will be implemented across the Project to minimise erosion and sediment impacts on significant flora and fauna habitats and threatened species:

- upgrade existing farm tracks or previously disturbed / cleared areas for construction traffic to minimise the amount of vegetation requiring removal and reducing fragmentation (compared with clearing required for new tracks)
- minimise track width to minimise clearing extents
- minimise the width of new and upgraded tracks within sensitive habitats such as stream crossings or through remnant/HVR vegetation.

5.2.3 Vegetation management

The following will be implemented across the Project to minimise impacts to vegetation to be retained cross the Project Site and to protect significant habitat values:

- implement the measures outline in the Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H) throughout construction, operational and decommissioning phases to ensure protection of vegetation adjacent to construction areas and across the Project Site.
- demarcate management zones, including physically marking out the clearing boundaries and designate of areas outside clearing boundaries as “no go” zones to avoid accidental damage to adjacent vegetation.
- pre-clear surveys to identify habitat features before clearing commences and allow development and implementation of an appropriate tree removal procedure. Pre-clear surveys will also search for conservation significant plants within the clearing footprint within potential habitat areas.
- 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).
- establish tree protection zones for hollow-bearing trees and/or all vegetation (especially large trees >30 cm DBH) to be retained adjacent to works protect trees adjacent to work sites in accordance with Australian Standard AS4970-2009 (Protection of trees in development sites) and the particulars detailed in the Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H).

certain activities detailed in the Vegetation Management Plan are restricted from within tree protection zones (e.g. refuelling, storage, parking of vehicles, etc.).

- tree felling will be conducted only when strictly necessary within the impact area, and tree trimming will be used as an alternative to felling, where possible.
- 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, off-site rubbish disposal) (Appendix M).

5.2.4 Fauna management

The following will be implemented across the Project to minimise impacts on MNES and other fauna habitats:

- Implement the measures outlined in the Fauna Management Plan (Ecosure, 2025c) (refer Appendix G) throughout construction, operational and decommissioning phases.
- Where engineering allows, large hollow-bearing trees that provide important denning/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 and the potential retention of these features will be discussed with the Project ecologist and engineering design team.
- Fauna spotter-catchers will be present during all habitat clearing works (e.g. trees, shrubs, earthen banks, built infrastructure, waterbodies or grassed areas) to detect fauna and conduct appropriate capture and release methods.
- Comply with the requirements of any Species Management Program required to tamper with the breeding place of fauna, as required under the Queensland Nature Conservation Act 1992.
- Wildlife management measures (e.g. escape devices or fencing) will be implemented during construction to reduce the potential for entrapment of fauna in trenches.
- Incorporate fauna friendly fencing design in areas where security fencing is required, avoiding barbed wire when not essential for livestock management to avoid entanglement of fauna.
- 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.
- 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.
- Monitoring programs will be implemented to enable management of pest animals during the construction and operation phases of the Project to minimise impacts of predation on native fauna species.
- Sequential clearing works will be implemented to allow fauna (specifically koala and greater glider) to self-relocate, including 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.
- Relocate habitat features (e.g. nesting logs) to adjacent habitat. Installation of nest boxes prior to clearing for all hollows identified to be removed within the clearing footprint. Nest boxes will be of a similar size as removed hollows to accommodate native fauna likely to utilise those hollows.

- Installation of fauna crossing infrastructure (e.g., glider poles) will occur at strategic locations in areas where the clearing footprint is greater than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6). The design of the glide pole and spacing will be completed during detailed design and take into consideration engineering, safety and ecological requirements as directed by suitably qualified experts in these areas, any/all relevant guidelines, and in agreement with DCCEEW

5.2.5 Invasive species

The following will be implemented across the Project to minimise impacts on the habitats of MNES across Project Site:

- restricted weed species will be treated prior to construction commencing using an appropriate control technique.
- implement additional weed control during construction if new or seasonal weeds are identified and if require additional treatment.
- follow effective treatment options presented in the Vegetation Management Plan (Ecosure, 2025e) (refer Appendix H).
- implement appropriate weed and disease hygiene protocols as detailed in the Vegetation Management Plan (Ecosure, 2025e) across the Project Site for the life of the Project including plant and vehicle washdowns prior to entering site (refer Appendix H).
- stockpile topsoil within proximity to removal site, within a designated stockpile area, outside of vegetation TPZs and within its respective biosecurity zone.
- maintain records of all material imported on-site, along with weed free declarations.
- a pest animal management plan will be developed prior to operation to ensure pest animal populations are managed for the life of the Project.
- restricted pest animals will be managed to minimise biosecurity risks.
- rubbish and food waste should be appropriately stored and disposed off-site to minimise attracting foxes, wild dogs and pigs.

5.2.6 Vehicle collisions

The following will be implemented across the Project to minimise the potential for collision between vehicles engaged on the Project and wildlife, including MNES such as koala:

- develop a traffic management plan to minimise damage to sensitive ecological areas and injury/mortality of fauna by:
    - 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 (<40 km/hr) and fauna safe behaviour through signage and staff training
    - install speed limit and signage to manage traffic impacts.

5.2.7 Pollution

The following will be implemented across the Project to minimise the potential for impacts associated with pollution related to the construction, operation and decommissioning of the Project:

- implement appropriate environmental management procedures in a Construction Environmental Management Plan (e.g. erosion and sediment control, dust suppression, weed and pest animal management, off-site rubbish disposal, spill management, and chemical and fuel storage).

- prepare and implement an ESCP containing methods for minimising sediment-laden runoff in accordance with Best Practice Erosion and Sediment guidelines
- minimise disruption of natural drainage patterns and water flows; and minimise construction activities within and/or adjacent to waterways to reduce any disturbance to those waterways
- retain the ground stratum and topsoil to retain soil structure and prevent erosion in sensitive areas adjacent to tracks and watercourse crossings rather than ground disturbance works (e.g. by trimming trees and woody shrubs).
- should topsoil require stockpiling for an extended period, a cover crop or a cover will be established over the stockpile to minimise erosion and retain soil health. Implement appropriate erosion and sediment control measures around any stockpiles and cleared areas.
- all washdown areas will be self-contained to avoid contamination of nearby areas and erosion from run-off.
- refuelling and fluid changes will only occur when appropriate fuel management measures (e.g. lining, bunding, etc) are present.
- storage or handling of hazardous chemicals during the construction and operation phases of the Project must be in accordance with legal requirements (i.e. Managing risks of hazardous chemicals in the workplace – Code of Practice (SWA 2023)), applicable safety data sheets, and otherwise in accordance with Queensland *Work Health and Safety Act 2011* and its regulations.

5.2.8 Fire management

Bushfire mitigation is detailed in Section 6 of the Bushfire Management Plan (refer Appendix L). The following actions will be implemented across the Project to minimise risks to MNES and their habitats from bushfire and as part of implementing the Bushfire Management Plan:

- adhere to the requirements of the Bushfire Management Plan (Appendix L) prepared for the Project.
- vegetation cleared from the disturbance footprint during the construction phase must not be pushed into windrows, the cleared vegetation must be removed from the disturbance footprint or mulched.
- hot works must be managed under a hot works permit system.
- hot works and other high fire risk activities, e.g. the operation of track machinery on rocky ground, must be monitored for ignitions and only performed if fire management controls are in place.
- vehicles and mobile plant and equipment must not be operated or parked in long grass, i.e. grass >30 cm in height, unless fire management controls are in place.
- smoking must only be permitted in cleared areas, i.e. the site compound, laydown areas, operations and maintenance facility and wind turbine generator hardstands.
- storage and handling of hazardous chemicals must not occur in vegetated areas.
- no fires are to be lit unless requested by relevant authorities.

5.2.9 Noise

The following will be implemented across the Project to minimise the potential for impacts associated with noise related to the construction, operation and decommissioning of the Project:

- construction noise is to be managed in accordance with state-legislated noise regulations.
- noise awareness training to be incorporated in the site induction and at toolbox talks.
- community consultation advising of the construction plan and duration of predicted construction noise.
- vehicles and machinery are to be regularly maintained and muffling devices checked to minimise noise levels.

- when selecting construction techniques and equipment/machinery, consider minimising noise disturbance.
- intermittently used machines are to be shut down or throttled down in intervening periods.
- where practicable schedule short-term high noise activities to reduce noise nuisance and intrusion.
- affected residences to be notified when work is likely to cause vibration or offensive noise.
- potentially affected residences to be notified of any out-of-hours construction works, ideally 24 hours in advance.

5.2.10 Vibration

The following will be implemented across the Project to minimise the potential for impacts associated with vibration related to the construction, operation and decommissioning of the Project:

- vibration limits to comply with Australian Standard AS 2436-2010 Guide to noise and vibration control on construction, demolition and maintenance sites.
- construction vibration mitigations and criteria to meet those detailed in the Transport Noise Management Code of Practice, Transport and Main Roads, March 2016.

5.2.11 Lighting

The following will be implemented across the Project to minimise the potential for impacts associated with lighting related to the construction, operation and decommissioning of the Project:

- directed lighting (downwards and / or shielded lighting) and low wattage light fixtures will be used on the Project Site during construction where practicable (if night works required or for site security) to minimise glare and light spill.
- external lighting at the Project Site will only be utilised for specific operational need (e.g. safe access to a turbine in low light), where it is required by law, or where it is otherwise required to ensure the security of the facility.

Lighting impact on roadways and to main residential receivers will be effectively screened by both existing vegetation and topography.

5.2.12 Dust

The following will be implemented across the Project to minimise the potential for impacts associated with dust related to the construction, operation and decommissioning of the Project:

- plan construction by locating dust generating activities away from sensitive land uses where possible.
- dust and wind will be monitored on-site and work that may generate significant levels of dust will cease if strong winds occur and the dust cannot be reasonably controlled by the Contractor.
- secure an appropriately licensed water source for dust suppression during the construction phase.
- water carts and dust screens will be used where appropriate to control dust emissions from exposed surfaces and dust generating activities at a frequency appropriate to conditions.
- manual cleaning of vehicles and roads will be conducted as required.
- cover all loose loads for transport to and from the work site.
- progressively rehabilitate and/or stabilise disturbed areas.
- maintain stockpiles, for example stripped topsoil, in a condition which prevents windblown dust generation, especially during dry or windy conditions.
- limit bare earth exposure to that essential to the efficient and effective construction of project infrastructure.

- works reasonably expected to generate dust emissions are to be planned to allow for completion during periods of lower wind speeds and / or where the works can be supported by suitable proactive dust control measures.
- where nuisance dust emissions cannot be effectively controlled, works are to temporarily cease until additional controls can be sourced to support the works or until a change in methodology to minimise dust emissions is identified.

5.3 Mitigation of impacts

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

- rehabilitating disturbed areas following completion of construction activities such as temporary WTG construction pads, laydown areas and other infrastructure (site office, construction compound) and removal of temporary infrastructure.
- incorporation of species specific rehabilitation measures to ensure habitats are enhanced (e.g. use of multiple species to ensure an appropriate long term mix of glossy black-cockatoo foraging resources).
- rehabilitating unused verges of tracks within sensitive habitats following construction.
- Protection and potential restoration of any vegetation corridors that may facilitate the long-term survival and dispersal of the threatened flora and fauna species identified in this assessment.
- installation of wildlife movement or nesting furniture or structures (e.g., glider poles and nest boxes for unavoidable loss of hollows). Installation of glider poles at Jumma Road (where the electricity infrastructure runs parallel to the road) may reduce the distances required for greater glider movement at this location.
- implement the measures outlined in the adaptive Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I), including a monitoring program to assess the effectiveness and implementation of controls and to develop appropriate responses to unforeseen impacts.

General minimising and mitigating strategies are provided in Table 5-2.

Table 5-2 Potential impacts to ecological values and proposed mitigation measures

Potential impact	Proposed mitigation measures
Removal of habitat	Set clear boundaries for clearing works. Keep clearing footprints to a minimum and compliant with any limits imposed by conditions. Where possible, remove limbs from trees rather than entire trees (e.g. adjacent to tracks and waterway crossings). Avoid removal of significant vegetation communities.
Declines in threatened species populations	Avoid vegetation clearing where previously cleared areas in the Project Site are available for the location of infrastructure. Avoid removal of critically important features of threatened species habitats (e.g. large hollow-bearing trees for greater gliders). Use fauna spotter catchers to identify and, if necessary, relocate threatened fauna before clearing works. Clearing should 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. Develop a Vegetation Management Plan to address potential impacts of construction on flora and vegetation communities. Develop a Fauna Management Plan to address potential impacts of construction on fauna and habitat.

Potential impact	Proposed mitigation measures
	Develop a Traffic Management Plan that includes measures to minimise impacts of construction on fauna and sensitive environmental areas. Implement the recommendations of the BBUS to address potential impacts of WTG operation on aerial species (Appendix J).
Erosion of waterways	Implement best Practice Erosion and Sediment Control Guidelines (IECA 2008) to prevent off-site impacts to downstream receiving environments. An ESCP is provided in Appendix N. Minimise disruption of natural drainage patterns and water flows; and minimise construction activities within and/or adjacent to waterways to reduce any disturbance to those waterways
Removal of hollow-bearing trees or logs	Where appropriate, logs and hollow limbs cleared during construction should 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 a qualified carer. A Queensland government approved Species Management Program high risk of impacts should 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 all habitat prior to and during clearing. Fauna spotter catcher should check creeks and drainage lines for frogs and aquatic fauna prior to any proposed works in waterways. Ensure fauna spotter catcher and appropriate site personnel have contact details for qualified carers to take any fauna injured or orphaned during works for rehabilitation. Develop a traffic management plan that includes measures to minimise impacts of construction on fauna including: • designated access routes • restricting vehicle traffic to daylight hours where possible • reducing the number of vehicles through the use of shared transport • enforcing strict speed limits.
Spread of weeds	Restricted weed species must be treated prior to construction commencing using an appropriate control technique. Reasonable control would include treating individual plants with a registered herbicide, which must be applied by an experienced and licenced weed control contractor. All plant and equipment will implement appropriate weed and disease hygiene measures when entering and leaving the Project Site.
Spread of pest animals	Restricted pest animals must be managed to minimise biosecurity risks. During construction and operation, rubbish and food waste should be appropriately stored and disposed off-site to minimise attracting foxes, wild dogs and pigs. Contributing to existing landholder and local government control programs for foxes, wild dogs and pigs may be beneficial to reduce impacts on native ecosystems and infrastructure (e.g. watercourse crossings, fences) and enhance community engagement.

Additional species-specific measures will be in place and are detailed in the Fauna Management Plan (Ecosure, 2025c) and Vegetation Management Plan (Ecosure, 2025e) (refer Appendix G and Appendix H).

5.4 Bird and bat management measures

The Bird and Bat Utilisation Survey (refer Appendix J) recommended the following measures for management and mitigation of impacts associated with turbine strike and barotrauma as well as changes in site utilisation and these have been incorporated into a Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I):

- Implement the adaptive management and monitoring program to assess the effectiveness and implementation of controls as required. Adaptive management measures should be applied during the operational phase of the Project.
- Investigate and implement mitigation measures for turbine strike, and, if applicable, radar-based curtailment technologies (e.g. Robin Radar or IdentiFlight). This is to mitigate against the risk of wind turbine strike for white-throated needletail in particular (which was identified at high risk of collision in both semi-quantitative and quantitative analysis) but is likely to reduce collision risk for other species travelling at RSA height. The IdentiFlight radar detection system in particular, while mainly used to detect large birds of prey, has been demonstrated to be capable of detecting white-throated needletails (Goldwind, 2022).
- Ongoing seasonal bird surveys and carcass monitoring (incorporating carcass persistence and observer efficiency trials) during operation must be conducted to monitor mortality rates of these species and respond adaptively to detected risks.
- Compare data collected quarterly following the commencement of operation against baseline data to monitor potential changes in the number and distribution of species and/or individuals utilising the site. A decrease in site utilisation may trigger the implementation of adaptive management measures in accordance with the Bird and Bat Management Plan (Ecosure, 2025b).
- During the construction phase of the Project complete additional bird and bat surveys during the flowering and fruiting (if present) season of foraging resources for flying-foxes and glossy black-cockatoos to gather further information on the usage of the Project Site by these species. Additional nesting hollow surveys should be undertaken during glossy black-cockatoo breeding season to identify potential nesting hollows in proximity (within 500 m) of WTGs. If nesting hollows are confirmed, these will be monitored into the operational phase to identify whether nesting hollows may be abandoned as a result of behavioural disturbance from WTGs.
- Maintain the RSA height at greater than 65 m above ground height, to minimise WTG collision risk to migratory woodland birds in particular.
- Ensure WTGs are micro-sited as far from remnant vegetation and watercourses or dams as possible within the infrastructure corridor. This aims to reduce risk to birds and bats as they traverse between habitat patches and farm dams.
- Ensure any lighting required for maintenance and/or operation uses aviation low intensity red lights where practical to reduce the attraction of insects and influence on nocturnal bird and bat species (Longcore, Rich and Gauthreaux Jr, 2008; DCCEEW, 2023b). Artificial lighting may also temporarily blind birds, particularly nocturnal species such as owls or other species used to flying at night or in low light conditions. Birds may then fly towards the lights and / or collide with physical structures such as WTGs or other infrastructure such as buildings and powerlines (Gauthreaux Jr and Belser, 2006). At this time proposed WTGs will not require obstacle lighting to maintain an acceptable level of safety to aircraft (Aviation Projects Pty Ltd, 2023).

5.5 Operational monitoring

The Bird and Bat Management Plan (Ecosure, 2025a) (Appendix I) presents a monitoring program designed to be adaptive to changes in monitoring data or finalisation of detailed Project design (refer Appendix I). The objectives of the monitoring program are to:

- detect changes in utilisation of habitat at the Project Site by birds
- detect mortality of birds and bats around the Project that can be attributed to direct impacts from the Project operation

- provide a framework for response to unacceptable or recurrent changes in habitat utilisation or mortality of birds and bats.

The operational monitoring surveys will be conducted for at least the first two years of wind farm operation to confirm the adequacy of the monitoring techniques and establish a baseline for the impact of wind farm operation. Should impacts exceeding prescribed trigger values be identified, the monitoring period will be extended to allow the effectiveness of adaptive management measures to be assessed. The final monitoring program is highly dependent upon a range of factors such as:

- monitoring effort and duration is appropriate to the final Project design and the associated risk to conservation significant birds and bats, to be determined through statistical design
- monitoring is related to the timing and specifications of the operational phase of the Project, such as whether a staged start-up approach is selected or soft starts employed
- monitoring is adaptive to the findings of the surveys and can be adjusted as needed, and will be extended where required to validate that corrective actions have had the intended effect of mitigating risk to birds and bats.

Post-construction monitoring surveys will include the following:

1. Quarterly seasonal bird utilisation surveys for two years at the commencement of operation of Tarong West Wind Farm to fulfill the “after” component of the BACI design and to detect any changes in the number and distribution of species and/or individuals utilising the Project Site. Surveys will be completed at 15 fixed-point locations using the same methodology as detailed in the BBUS report (refer Appendix J).
2. Twice yearly surveys for glossy black-cockatoo during the adaptive management period of wind farm operations. This will include targeted surveys for feeding activity at known feeding sites, particularly those in close proximity to WTGs. During the breeding season, searches will be undertaken within 500 m of each WTG for potential nesting hollow resources and if any are identified surveys will be completed to determine nesting activity for further monitoring during the breeding season or to detect signs of abandonment. Monitoring will occur for either two years or two breeding seasons, whichever is longer.
3. Annual flyout and nocturnal flying-fox surveys during the adaptive management period of wind farm operations if mass flowering and fruiting events (as confirmed by a suitably qualified ecologist) occur across the Project Site, providing foraging resources for flying-foxes.
4. Microbat surveys using microbat call recording devices and/or harp trapping to detect any changes of number of species and/or distribution across the Project Site.
5. Carcass surveys at the base of WTGs to determine direct impacts (collisions with WTGs), and searcher efficiency trials to inform the confidence of mortality estimates. Carcass surveys will be conducted monthly during the first two years of operation. An area of a circle with radius equal to the hub height of the turbine will be searched. A representative sample of WTGs and WTGs considered high risk will be searched during each monitoring period. This will include WTG site specific factors such as terrain, ground cover, seasonality, and obstructions. To obtain estimates of the efficiency of carcass monitoring, in addition to carcass persistence (item 6), observer efficiency trials will be conducted to determine the proportion of carcasses that observers find within a set amount of effort expended. These will inform the frequency of carcass searches.
6. Carcass persistence monitoring to determine the potential under estimation of impacts from collisions due to removal of carcasses by scavengers or decomposition. Carcass persistence trials will be completed within the first two years at a representative subset of WTGs, using carcasses of comparable size to birds and bats at risk of WTG strike.

Incidental observations of conservation significant bird or bat species will be recorded during all monitoring events by suitably qualified ecologists on Project Site. Key species will include:

- glossy black-cockatoo
- grey-headed flying-fox
- white-throated needletail

- migratory species.

5.6 Adaptive management

A risk assessment tool was included as part of the monitoring and adaptive management framework to assist with determining the significance of an impact (i.e. collision, carcass) detected by the monitoring program and assist with developing an appropriate management response to a breach of a trigger level.

Triggers signify that a threshold condition or impact has been reached and that the threshold is of a level requiring a management response. General triggers are provided in Table 5-3.

Table 5-3 General triggers for corrective action implementation

Category	Trigger	Trigger value
Death, or injury of, or site alienation of a species listed as threatened (critically endangered, endangered, vulnerable) under the NC Act and/or EPBC Act	Dead or injured fauna within a radius equal to the hub height of the turbine from the base of a WTG	Mortality or injury of 1 individual
	Point count survey location showing reduced species presence	Resident species not detected over two years of bird utilisation surveys
	Point count survey location showing altered species presence	Species detected in areas where not previously recorded in bird utilisation surveys
	Glossy black-cockatoo – reduced use of feeding trees	Evidence of feeding (chewed cones of *Allocasuarina* / *Casuarina* species) not detected in known feeding areas during the adaptive management period
	Glossy black-cockatoo – reduced use of nesting tree(s)#	Abandonment of any confirmed nesting trees during operation (no evidence of nesting after confirmed nesting event during the adaptive management period)
Death or injury of species listed as near threatened, SLC under the NC Act or migratory under the EPBC Act	Dead or injured fauna within a radius equal to the hub height of the turbine from the base of a WTG	Mortality or injury of 10^ or as per the species-specific trigger level identified in Table 5-4, whichever is lower
*Death or injury of Least Concern raptors or owls	Dead or injured fauna within a radius equal to the hub height of the turbine from the base of a WTG	Mortality or injury of 3
Death or injury of bats (LC flying-foxes or microbats)	Dead or injured fauna within a radius equal to the hub height of the turbine from the base of a WTG	Mortality or injury of 10
Unusually high mortality rates associated with one particular turbine.	Dead or injured fauna within a radius equal to the hub height of the turbine from the base of a WTG	Mortality or injury demonstrated to be significantly higher than other turbines.
^ 10 individuals represent a small percentage of the migratory species population in Australia for the species known or likely to occur within the Project Site. * Where there is a conflict between a species conservation status and its functional group, the lower trigger value shall prevail. For example, the trigger value for a grey-headed flying-fox will be as for threatened species and not bats, similarly for white-throated needletail. # Contingent upon locating known nesting tree(s) during baseline surveys.		

Species specific significant impact trigger thresholds have been set based on the concept that an annual fatality rate of >0.1% of the population would be significant due to serious disruption to an ecologically significant proportion of that population. This is consistent with the approach adopted at other wind farms. Table 5-4 outlines the species specific guidelines for threatened and migratory

species which may occur within the RSA (excludes ground dwelling species squatter pigeon and black-breasted button-quail) and where population numbers are reliably known.

Table 5-4 Species specific significant impact trigger thresholds

Species	Risk level	Estimated population	Annual trigger threshold based on 0.1% of population
White-throated needletail	High	41,000 (Tarburton & Garnett, 2021), with a nationally important proportion of the population is 10 and an internationally important proportion of the population is 100 individuals (DoE, 2015a)	41
Grey-headed flying-fox	High	680,000 (±158,500) individuals based on the National Flying-Fox Monitoring Program (DCCEEW, 2021a)	680
Fork-tailed swift	Medium	100,000 with a nationally important proportion of the population is 100 individuals (DCCEEW, 2023b)	100
Glossy black-cockatoo	Medium	7,000 – 14,000 (Birdlife, 2025)	7
Glossy Ibis	Low	Resident in most of Australia, estimated population globally is between 230,000 – 2,220,000 individuals (Birdlife, 2025).	230
Oriental cuckoo	Low	Birdlife International (2025) estimates 500,000 – 5,000,000 mature individuals. 1,000 is listed as an ecologically significant proportion of the population of a migratory species (DoE, 2015)	1,000
Australasian bittern	Low	estimates 2,500 mature individuals (BirdLife, 2025)	2.5
Diamond firetail	Low	136,000 mature individuals (DCCEEW, 2023d)	136
Regent honeyeater	Low	Estimated at 340 – 400 mature individuals in 2010 (Birdlife International, 2025)	1

Once a trigger value in Table 5-3 or Table 5-4 has been reached, an investigation will commence, including reporting the incident as required and completion of a risk assessment to determine the significance of the event and determine if immediate mitigation action may be required. If the event is determined to be a significant impact, then this will either:

- require further investigation/survey to determine level of impact;
- require corrective action within approved timeframes to implement one or more of the mitigation measures outlined in the Bird and Bat Management Plan (Ecosure, 2025a) to attempt to reduce further impacts.

Corrective actions and mitigation measures proposed in response to events resulting in a significant impact, are summarised in Table 5-5.

Table 5-5 Corrective actions and mitigation measures

Mitigation measure	Management details	Timing for implementation
Increase survey effort	Increased survey effort will provide additional data that supports a trigger level breach. The frequency of point count surveys and/or targeted surveys will be increased depending on the species targeted, the behaviour and ecology of the species and the location of the trigger.	Next seasonal survey opportunity.

Mitigation measure	Management details	Timing for implementation
Investigate activities or events	Investigation will provide contextual data that may have contributed to a species mortality or absence from the site. This may include such events as bushfires, mass flowering events, severe storms, drought or heat waves that will influence species utilisation of the site. In the case of glossy black-cockatoo factors such as extended breeding period, use of alternative nest site, or changes in food source availability should also be investigated as well as extended monitoring where use of a breeding site has been interrupted (e.g. to capture the next season which could be two years from the trigger event.	Immediate or as soon as practically possible and in consultation with a suitably qualified ecologist.
Continue BUS	Where wider impacts on species utilisation across the Project Site are suspected utilisation surveys are to continue in conjunction with wider assessments of biological and anthropogenic influences impacting the region and consideration of project impacts (habitat clearance, regeneration of disturbed areas, fire management).	Next seasonal survey opportunity, must be reviewed by a suitably qualified ecologist and statistician to ensure any changes can be statistically incorporated into the monitoring program.
Investigate anthropogenic activities	Anthropogenic activities not related to this project may also require investigation to determine whether those activities have contributed to species mortality or absence (e.g., baiting for wild dogs causing attraction of carrion-foraging wedge-tailed eagles, new stock watering point constructed attracting birds, planting of crops that provide foraging resources).	At appropriate times, following strikes to a threatened species and in consultation with regulators.
Investigate attractants	Investigate attractants such as artificial lighting, which attracts both birds and bats and their food sources such as insects (Longcore et al., 2008). Artificial lighting may also temporarily blind birds, particularly nocturnal species such as owls or other species used to flying at night or in low light conditions. Birds may then fly towards the lights and / or collide with physical structures such as WTGs or other infrastructure such as buildings and powerlines (Gauthreaux Jr & Belser, 2006).	At appropriate times, following strikes to a threatened species and in consultation with regulators.
Investigate deterrents	Where it has been shown that a species mortality has been caused by collision with a WTG and the risk assessment has determined a significant impact has occurred, a variety of deterrents may be investigated to attempt to direct birds away from WTGs. Deterrents may involve physical objects or aural cues that attempt to scare birds away.	At appropriate times, following strikes to a threatened species and in consultation with regulators
Carrion management	Removal of carrion from the area around WTGs to reduce the potential incidence of raptor collision where these are attracted to an additional food resource on site.	During WTG routine maintenance and operations – ongoing.
Onsite habitat creation / improvement / protection / modification	To provide alternative habitat away from WTGs should avoidance of habitats be identified (in particular for glossy black-cockatoos).	Survey results identify glossy black-cockatoo avoidance of WTG areas – prior to the following nesting season.
	Should habitat be attracting species to a particular turbine where it becomes a high risk of meeting a	Increase in species-specific utilisation observations at a WTG –to be agreed with a suitably

Mitigation measure	Management details	Timing for implementation
	trigger threshold, complete vegetation management and creation of additional habitat away from WTGs. This mitigation does not imply that additional habitats will be cleared over and above the approved clearing for the Project.	qualified species expert and regulators to avoid impacts to other threatened species and to ensure habitat management is justified and addressed.
Implement radar detection systems and temporary turbine slowdown	Several radar systems are available that are designed to detect birds and slow WTGs when birds approach the blades. Currently, these systems are most commonly implemented to detect large birds, in particular birds of prey. However, a recent study on the effectiveness of one radar detection system at a wind farm in Australia (Goldwind, 2022) determined that smaller species, such as white-throated needletails, were able to be identified.	At appropriate times, following strikes to a threatened species and in consultation with regulators.
Modify turbine activity - glossy black-cockatoo nesting season	Modification of wind farm and turbine activity during glossy black-cockatoo nesting season where individuals are found to be nesting in a previous nest site at a location known to have been abandoned.	Survey results identify glossy black-cockatoo at a previously abandoned nest site.
Modify turbine activity – changes in site utilisation	Modification of turbine activity in areas where changes in site utilisation by conservation significant species can be directly attributed to the operation of turbines. This could include options for seasonal modification to avoid migratory occupation of the site or changes in response to conditions that favour particular species (e.g. turbines adjacent thoroughfares that are used during identified weather events or those near intermittent food resources such as mass flowering events).	Survey results in an annual report identify changes in site utilisation. Implement as appropriate and in consultation with regulators.
Biodiversity offsets determined in consultation with regulators	If significant impact thresholds have been exceeded (Table 5-3 or Table 5-4) or identified as a recurring risk.	Timing for delivery of offsets to be determined in consultation with appropriate authorities.

In addition to the mitigation measures highlighted in the above sections, the Bird and Bat Management Plan (Ecosure, 2025a) (refer Appendix I), further mitigation measures will be implemented when trigger values are breached, including the following in increasing level of response:

In addition to the above bird and bat monitoring program, a separate monitoring program for pest animal populations will be developed as part of a pest animal management plan. This will monitor population numbers across the Project Site with triggers to enact management actions to maintain populations at a level that reduces the threat to native fauna predation, in particular koala and greater glider. This program will include predator control if signs of koala predation or increased predator numbers are observed both during construction or operation. Evidence or sightings of pest animals on the Project Site will be recorded in a register to remain on-site. If sightings increase in frequency or new pest species are observed, humane pest controls will be implemented.

5.7 Recurring risk investigation framework

In the event that an impact trigger occurs and the incident is potentially a recurring risk, a significant impact assessment (in accordance with the EPBC Act Significant Impact Guidelines 1.1 or the relevant Queensland Government Significant Residual Impact Guideline) will be completed with updated data from utilisation surveys, carcass monitoring and a revised collision risk model.

In the event that the incident is potentially a recurring risk, the following activities will be undertaken:

- species-specific monitoring and mitigation program, with periodic reports provided to regulators;

- if, once all other additional mitigation measures are implemented and the impact trigger is recurring, operational curtailment may be considered in consultation with relevant regulators.

In consultation with the relevant regulators, if a fatality or injury is determined to be an isolated event, or there is no significant impact to the species, no further action will be required. All documentation of any investigations, along with recommended mitigation measures will be summarised in the annual reports and provided to the regulators.

5.8 Confidence in predicted effectiveness

Justification for confidence in predicted effectiveness of the mitigation measures outlined in Section 5.3 (including their successful use on prior Projects, where relevant) and the anticipated effectiveness is provided in Table 5-6. Anticipated effectiveness is scored accordingly:

- Very highly effective: complete avoidance of known occurrences and/or habitats
- Highly effective: substantial avoidance of known occurrences and/or habitats
- Moderately effective: areas of direct and/or indirect impacts are minimised through design and construction methods
- Low effectiveness: mitigation of impacts only through implementation of management actions, fauna spotter-catchers, control mechanisms
- Very low effectiveness: no mitigation strategies proposed.

Table 5-6 Predicted confidence in mitigation measures

Mitigation measure	Justification	Expected effectiveness
Project Site measures		
Site induction for all personal.	This measure is common practice on construction sites across Australia and improves the awareness across the whole Projects workforce of the environmental values present on-site, construction methodologies to adhere to the Project design, and committed and required environmental management measures. Aids in meeting the General Environmental Duty under the Queensland *Environmental Protection Act 1994*.	Highly effective at educating Project work force.
Clearing limits adherence documented in management plans and inductions.	Site inductions are a standard construction practice and increases awareness of the Project environmental commitments under the approved Project management plans.	Highly effective at avoiding unintentional clearing or impacts to environmental values outside clearing footprint.
Micro-siting – tracks and WTGs.	This measure is used often in large infrastructure projects, particularly wind farm development to minimise impacts to environmental values (e.g. vegetation patches, hollow bearing trees or habitat for protected species) where the Project design can allow, which is often unknown until construction methodology is finalised. Micro-siting within the clearing footprint at the time of construction also allows for track widths to be reduced wherever possible and retain ground stratum and top soil in areas clearing may not be required.	Highly effective in minimising impacts by avoiding specific habitat and features for listed threatened species.
Access tracks will be aligned with existing farm tracks or previously disturbed / cleared areas to minimise.	This measure reduces the required clearing within the Project Site, along with increasing fragmentation of the landscape. Road widening is common practice for road and infrastructure construction projects to minimise the magnitude of impact to existing vegetation.	Highly effective in minimising clearing and loss of available habitat to threatened species.
Rehabilitation of cleared areas not required for ongoing operation.	This measure will minimise the potential for erosion and sedimentation of adjacent habitats. Rehabilitation of these areas will also reduce the likelihood of weed establishment and minimise potential impacts to adjacent habitats Rehabilitation of temporary areas required for construction works but not operationally is a standard practice for construction projects.	Low effectiveness at minimising direct and indirect impacts.
Vegetation management specific		
Identify and demarcate clearing areas, “no-go” zones and tree protection zones.	Nomination of no-go zones is a common construction practice that is effective in keeping machinery and personnel out of environmentally sensitive areas. Tree protection measures as outlined by the Australian Standard AS4970-2009 Protection of trees on development sites.	Highly effective at avoiding unintentional clearing or impacts to retained environmental values.

Mitigation measure	Justification	Expected effectiveness
Protected plant avoidance by pre-clear surveys and micro-siting.	Pre-clear surveys will employ methodologies as detailed in the Queensland Department of Environment, Tourism, Science and Innovation's Protected Plant Survey Guidelines prior to construction, to identify any Critically Endangered, Endangered or Vulnerable flora species within the clearing footprint.	Highly effective at avoiding impacts to threatened flora.
Fauna management specific		
Species Management Program –mitigate impacts to fauna breeding places.	Section 335 of the Nature Conservation (Animal) Regulation 2020 (Animal Regulation) governs tampering with animal breeding places. Under the Animal Regulation, s335(1), it is an offence to tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring. Section 335(2) states that an animal breeding place is being used by a protected animal to incubate or rear the animal's offspring if: the animal is preparing, or has prepared, the place for incubating or rearing the animal's offspring; or the animal is breeding, or is about to breed, and is physically occupying the place; or the animal and the animal's offspring are physically occupying the place, even if the occupation is only periodical; or the animal has used the place to incubate or rear the animal's offspring and is of a species generally known to return to the same place to incubate or rear offspring in each breeding season for the animal. Section 335(4) defines tamper (with an animal breeding place) as "damage, destroy, mark, move or dig up the breeding place". Section 332(1) does not apply if the removal or tampering is part of an approved Species Management Program for animals of the same species (s335(3)). Section 335(4) defines an approved Species Management Program, for a species of animal, as "a program about managing the population and habitat of the species of animal that is approved by the chief executive". If a breeding place for a protected animal is likely to be disturbed by construction activities, a Species Management Program is required to be prepared and approved by the Queensland Department of Environment, Tourism, Science and Innovation. A low risk of impacts (least concern species) and high risk of impacts (threatened, special least concern and colonial breeding species) Species Management Program will be developed and approved prior to clearing accounting for relevant species breeding places that may occur within the clearing footprint.	Highly effective at identifying and avoiding impacts to breeding places of threatened species.
Pre-clearance surveys for fauna and fauna breeding places.	Pre-clearance surveys will be undertaken with consideration of the following documents: Survey Guidelines for Survey Guidelines for Australia's Threatened Mammals (DSEWPC, 2011) Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Eyre *et al.*, 2018) a high risk of impacts Species Management Program approved by Queensland Department of Environment, Tourism, Science and Innovation, including the Information sheet Species Management Program Requirements for tampering with a protected animal breeding place in Queensland	Highly effective at avoiding impacts to threatened fauna.

Mitigation measure	Justification	Expected effectiveness
	Queensland Department of Environment, Tourism, Science and Innovation Guideline for completion of an Animal breeding place register. Pre-clearance surveys are a common practice for all vegetation clearing works on construction sites to detect active and inactive breeding places (nests, burrows, hollow-bearing trees) and fauna presence within the Project Site prior to clearing. Pre-clearance surveys are a measure identified in the above documentation and a commonly approved methodology to minimise impacts to fauna from clearing in approved Species Management Programs (refer Information sheet Species Management Program Requirements for tampering with a protected animal breeding place in Queensland).	
Fauna spotter-catcher present during all clearing works. Including pre-clearing inspections immediately prior to clearing.	Fauna spotter-catcher will be required as part of an approved Species Management Program, to be present on-site immediately prior to, and during vegetation clearing, and all fauna handling will be undertaken by a qualified, licenced, and experienced fauna spotter-catcher in accordance with a valid Rehabilitation Permit issued by the Department of Environment, Tourism, Science and Innovation, under the Nature Conservation (Animals) Regulation 2020. If an animal is injured during any stage of works, it will be taken to a licenced wildlife carer in accordance with the *Code of Practice for Care of Sick, Injured or Orphaned Protected Animals in Queensland* (DES 2013). This is a common practice for a range of projects involving clearing in Queensland.	Moderately effective overall to prevent injury and mortality of medium to large mammals, however, small cryptic animals are difficult.
Fauna exclusion fencing and escape devices. Fencing design will allow for the movement of fauna through and over it, avoiding the use of barbed wire on the top strand of fences.	Fauna fencing is discussed in detail for construction sites in the Queensland Department of Transport and Main Fauna Sensitive Transport Infrastructure Delivery manual, Chapter 7: Construction. Fauna fencing serves to exclude fauna and provide security, as well as reduce vehicle collisions with fauna on roads and tracks. Escape devices along fencing such as poles can also be installed dependent on the fencing design and the infrastructure the fencing is surrounding. Where required to maintain fauna escape devices will be installed to facilitate fauna exiting the clearing footprint into adjacent habitat. 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 to minimise fauna entanglement leading to fatalities. Escape devices will be installed in open trenches to minimise impacts of entrapment, leading to fatality. Trenching escape devices are common practice to mitigate impacts particularly to small ground dwelling mammals, reptiles and amphibians.	Moderately effective at excluding fauna from impact areas.
Traffic management (speed limits, enforcement and signage)	The timing, volume and speed of vehicles has a significant effect on rates of fauna collisions, with higher rates of collision occurring during periods of increased fauna activity and periods of higher traffic volume. Vehicle management, particularly speeds and signage are discussed in the Queensland Department of Transport and Main Fauna Sensitive Transport Infrastructure Delivery manual, Chapter 6: Mitigation.	Moderately effective overall to prevent injury and mortality of fauna.

Mitigation measure	Justification	Expected effectiveness
	A traffic management plan will be developed to detail measures to minimise the risk of fauna collision, including to reduce speed limits to <40 km per hour in areas and at times where collision risk is high; details of appropriate signage and where relevant traffic calming mechanisms or animal detection systems.	
Species specific measures		
Installation of glider poles in areas of confirmed glider habitat with a clearance width greater than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6), to maintain habitat connectivity. Maintain habitat patches where design allows between large clearing widths in greater glider habitat.	Where detailed design for the track, drainage and corridor for electrical reticulation will clear spans wider than the maximum glide distance (determined by tree height data and a precautionary glide ratio of 1.6), glide poles will be installed (where Project design allows) at key points to avoid gliders having to traverse the ground. Although, glide poles have had limited success in southern states when installed for road crossings, installation (along with monitoring) of these structures in this rural area will aid in minimising the impact of habitat fragmentation of glider habitat along Jumma Road. Although, there is limited research of glide pole use by greater gliders, which are considered to have high site fidelity and limited dispersal (Suckling, 1982; Taylor, Tyndale-Biscoe and Lindenmayer, 2007), there are studies to show glide poles have been successful at repeated use by more active species such as yellow-bellied gliders (*Petaurus australis*) in northern New South Wales (Taylor and Rohweder, 2020). A study by GHD (2017) found greater gliders were more likely to use glide poles in areas where surrounding vegetation was more intact and connected, when compared to an area where surrounding vegetation had several large, cleared areas nearby. Installation and monitoring of glide poles in the rural environment of the Project Site to facilitate the crossing of the Jumma Road corridor (varies between 35 m – 120 m wide sections) will further inform the degree of success of this mitigation measure.	Low effectiveness dependent on placement and specific pole design.
Sequential clearing will occur to minimise impacts on native fauna, particularly koala.	A clearing procedure along with daily clearing limits will be developed and communicated to all personnel involved in vegetation clearing. The direction and pace of clearing will be managed daily through clear communication between the fauna spotter-catcher observing for fauna and the clearing machinery operator undertaking the clearing actions. Sequential clearing is best practice as it allows fauna to self-relocate and promotes fauna movement away from harm and towards adjacent habitat during the clearing process. Sequential clearing is a requirement for clearing koala habitat trees in koala districts under the Queensland Nature Conservation (Koala) Conservation Plan.	Moderately - highly effective for mitigating the impacts of clearing on threatened fauna.
Nest box installation to be undertaken where active dens are identified within the clearing footprint to compensate for loss of denning resources.	Nest boxes are commonly used as a replacement of animal breeding structures and have been identified in the literature as a mitigation measure for greater glider hollows (Beyer and Goldingay, 2006; Goldingay *et al.*, 2015; Vinson, Johnson and Mikac, 2021). Longer term deployment of nestboxes made of durable thermally insulated materials can provide additional value as denning habitat in the medium-term whilst hollows develop, particularly for greater glider.	Low – moderate effectiveness dependent on species behaviour and nest box design.

Mitigation measure	Justification	Expected effectiveness
	The Commonwealth Conservation Advice for *Petauroides volans*, identifies supplementing hollow availability (denning resources) with artificial hollows as a potential management measure.	
Invasive species - implement weed and pest control across the Project Site.	Measures detailed in the Vegetation Management Plan (Appendix H) follow those outlined by the following guidelines and standards Queensland Department of Agriculture and Fisheries – factsheets detail recommended species-specific controls for matters listed under the *Biosecurity Act 2014*. Weed certification (i.e. Weed Hygiene Declaration Form or Vehicle Hygiene Inspection Report) will follow the Queensland Department of Agriculture and Fisheries *Vehicle and Machinery Inspection Procedure, Biosecurity Queensland Checklists 2013*. Washdowns will be completed by trained operators, holding the nationally recognised certification AHCBIO203 - *Inspect and clean machinery, tools and equipment to preserve biosecurity.* Develop and implement a pest animal management plan that details a monitoring and management program to ensure pest animal populations do not increase. Waste management procedures detailed in the Environmental Management Plan (Appendix M) to minimise waste attractants to pest animals.	Moderately effective for mitigating the impacts of invasive species.
Pollution management.	Hazardous chemicals will be stored in accordance with legal requirements (i.e. the *Australian Code for the Transport of Dangerous Goods by Road and Rail edition 7.7, 2020*) and accompanied with material safety datasheet (MSDS) in accordance with the *Preparation of Safety Data Sheets for Hazardous Chemicals Code of Practice*.	Moderate effectiveness: mitigation of impacts.
Fire management to prevent unintended fires on-site (including vegetation stockpile management, hot works permits and areas, smoking and hazardous chemical storage).	Fire management measures are detailed in the Project specific Bushfire Management Plan (Appendix L), which is developed in accordance with the State Planning Policy and incorporates a range of measures commonly implemented on similar infrastructure projects occurring in rural landscapes.	Highly effective to reduce the risk of unintentional fires.

5.9 Statutory and policy basis for measures

The measures proposed are based on relevant national, state and local legislation, policy and guidelines, including relevant conservation advices, recovery plans, threat abatement plans and other guidance documents published by DCCEEW. In some instances, guidance from international guidelines or best practice has been considered when determining the most appropriate management and mitigation measures. Where relevant these documents have been cited in this chapter and the measures proposed are not inconsistent with the relevant plans.

5.10 Management plans

The Project will be carried out in accordance with a number of management plans aimed at ensuring objectives for best practice environmental management are achieved throughout the life of the Project. Management plans submitted in support of the Project are:

- Environmental Management Plan (Appendix M)
- Erosion and Sediment Control Plan (Appendix N)
- Bushfire Management Plan (Appendix L)
- Fauna Management Plan (Appendix G)
- Vegetation Management Plan (Appendix H)
- Bird and Bat Management Plan (Appendix I)
- Rehabilitation Management Plan (Appendix K)
- Decommissioning Management Plan (Appendix B)
- Draft Offset Strategy (Appendix O)

Section 6.0 Rehabilitation

Rehabilitation

A RMP (refer Appendix K) has been prepared to provide direction for rehabilitation activities required at various stages over the life of the Project. The RMP provides a structured framework for implementing and monitoring rehabilitation efforts, ensuring the restoration of impacted areas to an agreed-upon standard. It includes details on rehabilitation strategy, methodologies, timelines, and performance indicators.

The RMP provides a central point of reference to confirm rehabilitation requirements and outcomes. It is subject to ongoing review by the Proponent and will be implemented alongside landholder agreements that stipulate the potential mutually agreeable rehabilitation outcomes and other Project management plans. Mutually agreed rehabilitation outcomes may include conversion of hardstands to grassed paddocks and other grassed areas, rather than reinstatement of all ecosystem strata.

The Project has two core phases relating to rehabilitation:

1. post-construction rehabilitation
2. rehabilitation as part of decommissioning the wind farm.

There may be incidental rehabilitation requirements during the Project operational phase, and these works must be undertaken in accordance with the RMP.

6.1 Existing conditioned rehabilitation work

The Queensland Government approval included two conditions that specifically require the Proponent to undertake rehabilitation work (refer Table 6-1).

Table 6-1 Approval conditions specific to rehabilitation in the Queensland Government approval

No.	Conditions of development approval	Condition timing
13	a. prepare a Rehabilitation Management Plan (RMP) outlining how all areas cleared for construction will be replanted and/or rehabilitated after construction retaining only the minimum footprint required for safe operations, including maintenance, of the wind farm. b. the RMP must: i. be prepared by a suitably qualified professional. ii. reflect the species composition and density of pre-existing vegetation. iii. outline weed management measures throughout stages of planting and regrowth. iv. be responsive to the varying characteristics of areas to be rehabilitated including varying access track cross-sections, turbine pads, construction laydown areas, areas for ancillary construction related infrastructure such as accommodation camps, Project offices and car parks, concrete batching plants etc. v. be prepared acknowledging the Site Stabilisation Plan-Operations (SSPO) required in accordance with Condition 19 of this approval. vi. identify proposed timing of rehabilitation activities to minimise the time the disturbed Project footprint is left unvegetated. c. submit the RMP to: i. The Department of Housing, Local Government, Planning and Public Works (windfarms@dsdilgp.qld.gov.au) d. Implement the measures recommended in the RMP.	(a) to (c) Within 12 months after the commencement of construction (d) Within 12 months after the practical completion of the wind farm
31	a. prepare an End of Operation Decommissioning Management Plan (EODMP). b. the EODMP must: i. be prepared by a suitably qualified person. ii. demonstrate that all wind turbine componentry and ancillary infrastructure will be reused and/or recycled to the maximum extent	(a) to (c) At least 6 months prior to ceasing the operation of the wind farm

No.	Conditions of development approval	Condition timing
	possible thereby minimising to the greatest extent possible material destined for land fill. iii. outline all actions to be undertaken to decommission the site including: ▪ deconstruction and removal off-site all above ground structures and infrastructure (including turbines, substations, and above ground cabling). ▪ management of impacts on the transport network arising from removal of materials from the Project Site. ▪ dismantling turbine bases to a depth of 1m below surface level and covering with topsoil. ▪ lightly rip and reseed with native vegetation all hardstand areas (after being cleared of stone and geotextile material). ▪ decontaminate any affected areas in accordance with requirements of the *Environmental Protection Act 1994*. c. submit the EODMP to the Department of Housing, Local Government, Planning and Public Works (windfarms@dsdilgp.qld.gov.au). d. decommission the wind farm in accordance with the EODMP. *Note: Suitably qualified person means a person(s) who has professional qualifications, training, skills and/or experience relevant to area of expertise (decommissioning large scale industrial developments).*	(d) Within 12 months after the wind farm has ceased operations

The Proponent will implement the RMP in accordance with, and alongside, the state approval conditions.

6.2 Methodology overview

The rehabilitation methodology will follow these key steps:

- site assessment
  - a detailed assessment of the Project Site prior to the commencement of rehabilitation works is essential in the establishment of a site-specific ecological restoration/rehabilitation methodology.
- rehabilitation design documentation
  - the RMP has been developed with reference to the processes specified in the South East Queensland Ecological Restoration Framework Manual and ecological reporting completed by specialist ecologists, Ecosure. The rehabilitation design includes management area zones based on vegetation type, providing assessment managers, clients, and contractors with a methodology to facilitate the recovery of ecosystems that have been degraded, damaged, or destroyed.
- site works
  - site works can be typically broken down into the following categories:
    - primary works: typically includes initial weed management, soil preparation, cultivation and modification, and mulching.
    - follow-up works: typically includes watering, monitoring, reporting, natural regeneration of plants, replacement of failed plants and access track upkeep.
    - maintenance works: typically includes watering, monitoring, reporting, natural regeneration, weed control, formative pruning, replacement of failed plants and access track upkeep.

For further detail on rehabilitation methodology, including a schedule of works example designed to demonstrate how specific rehabilitation activities will be undertaken to support the rehabilitation

objective refer to Appendix K. The schedule details the various components that the Proponent and Rehabilitation Contractor will coordinate.

The rehabilitation design will reflect the particulars of the landform and disturbance, and in many instances be subject to the requirements of the landholder agreement. Nonetheless, a safe, stable and non-polluting landform will be the objective at all times.

Section 7.0 Offsets

Offsets

An extensive process has been undertaken during project development to avoid, minimise and mitigate potential impacts as a result of the Project. As a result of this process, significant impacts which are not able to be feasibly avoided, minimised or mitigated, are considered significant residual impacts. Section 4 of the PER assesses the significant residual impacts of the Project.

As the Project is likely to have a significant residual impact on multiple species, offsets to address these impacts will be required. Despite the Proponent's assessment, DCCEEW considers the proposed action may have a significant impact on the glossy black-cockatoo and grey-headed flying fox. While the Proponent remains of the view that such an impact is unlikely, to ensure DCCEEW's response is adequately addressed, the Proponent has considered the glossy black-cockatoo as if the proposed action will have a significant impact requiring offset.

Under the EPBC Act, environmental offsets are required to compensate for these impacts, after all reasonable efforts have first been made to avoid, minimise, mitigate and rehabilitate.

To compensate for the significant residual impacts of the Project, the proposed offsets package includes the following:

- a direct land-based offset to compensate for the majority of the Project offset requirement (refer to the Draft Offset Strategy (DOS) in Appendix O), including for the full extent of residual impacts to the koala, grey-headed flying-fox, greater glider and glossy black-cockatoo.

Environmental offsets will compensate for significant residual impacts that remain after implementing all practical measures to avoid, minimise and mitigate impacts. A review of habitat quality across the impact areas and proposed offset areas has been completed to support the Draft Offset Strategy. Habitat quality assessments completed on proposed offset sites informed the assessment of the suitability of the proposed offset to deliver a net environmental gain over the life of the offset.

Direct offsets will be delivered in accordance with an Offset Area Management Plan (an in progress document), which outlines strategies and measurable objectives for the enhancement of environmental conditions to achieve the required ecological gains. The Offset Area Management Plan will identify the offset requirements for each matter, demonstrate the feasibility, security and the proposed management approach for the offsets to compensate for significant residual impacts.

The Offset Area Management Plan will address the requirements for the land-based offset areas nominated for the koala, grey-headed flying-fox, greater glider and glossy black-cockatoo, which consists of four properties. Three properties are located immediately to the east and north of the proposed Tarong West Wind Farm (Table 7-1), and the fourth property is approximately 45 km northwest of the Project Site (refer Figure 8-1).

The proposed offset area comprises land from these four properties and provides a total of approximately 2,100 ha of habitat suitable to offset impacts to koala, grey-headed flying-fox, greater glider and glossy black-cockatoo.

Table 7-1 Proposed offset area per impacted species

Species	Habitat impact area	Offset area across four properties (ha)
koala	270.52 ha (15.46 ha of Preferred habitat in remnant vegetation, and 115.2 ha of modelled General habitat and 139.86 ha of modelled General habitat within non-remnant areas)	2,104
grey-headed flying-fox	270.51 ha (130.65 ha of Potential foraging, 139.86 ha of Low quality Potential foraging)	2,104
greater glider	270.12 ha (15.46 ha of Preferred habitat in remnant vegetation, 112.08 ha of Potential habitat with future food and den trees in non-remnant areas and 142.58 ha of Dispersal habitat)	1,168

Species	Habitat impact area	Offset area across four properties (ha)
glossy black-cockatoo	87.86 ha (72.4 ha Potential breeding habitat that is 108 trees, 15.46 ha Potential foraging habitat)	1,289

Risk of loss without offset

The risk of loss for the proposed offset area is informed by the *Guidance for deriving 'risk of loss' estimates when evaluating biodiversity offsets proposals under the EPBC Act* prepared by University of Queensland for DCCEEW (Maseyk et al. 2017).

At this point in time, most of the offset properties are mapped as non-remnant so existing vegetation is not protected under Queensland or local government legislation. Further clearing and/or thinning of woody vegetation could therefore occur in these areas under "business as usual" cattle grazing land use over the next 20 years. However, rates of clearing are unlikely to be above background rates for the South Burnett local government area (0.32% loss per year or 6.36% loss over 20 years). Furthermore, DCCEEW have advised the risk of loss value is 0% based on the current application of the Offsets Assessment Guide (OAG). The Proponent has adopted 0% at this point in time, however, there remains a tangible risk of loss at the offset sites.

Habitat modelling

The MNES assessment report (Ecosure 2023a) and MNES supplement report (Appendix E) incorporate modelling of suitable habitat types for MNES species within the impact area, in accordance with relevant Commonwealth guidelines (e.g. DAWE 2022a, 2022b; DCCEEW 2022; 2024a).

The Draft Offset Strategy (Appendix O) provides justification that the offset area provides suitable habitat for MNES species, including:

- the presence of suitable remnant and regrowth REs (RE 11.3.25, 11.3.4, 11.11.15, 11.12.3)
- suitable habitat features (e.g. suitable food trees, suitable shelter/denning trees)
- evidence of occupation by the species (either direct observation or signs).

'**Like-for-like' habitats**

Correlations of modelled habitat types and Assessment Units (AUs) for koala in the impact and offset areas have been undertaken. Offset areas were stratified into AUs in accordance with the GTDTHQ version 1.2 (DEHP 2017) and match or exceed habitat quality within impact areas.

Field surveys were conducted at impact and offset during 2024, with additional surveys conducted in 2025. Surveys within the impact site have occurred at least once a year since 2018 to understand ecological values.

Survey methodology supporting the offsets investigation have included BioCondition surveys and habitat quality assessments within representative sites, targeted species surveys for the four MNES values, and observations including presence of threatening processes and management opportunities.

The Proponent will provide detailed scoring methodology, results, analysis and justifications for the information provided in the DOS once all analysis is completed. The analysis of impact area starting condition included division of habitat into utilisation types (where applicable) as well as assessment units. The offset areas were divided into management opportunity areas of habitat management or restoration as well as assessment units.

The final habitat quality score for the impact area and offset area will be calculated by summing site condition out of 3, site context out of 3, and species stocking rate out of 4, resulting in a score out of 10 for each assessment unit.

Koala

Residual significant impact

The significant residual impact to koala is characterised as preferred habitat, general habitat, and general low habitat (Table 7-2).

Table 7-2 Koala habitat residual impact

Habitat utilisation type	Habitat definition (Ecosure, 2025)	Area (ha)	Condition score out of 10
Preferred	Contiguous areas of ground-truthed remnant and high value regrowth eucalypt open forest and woodlands containing locally important koala trees (LIKT).	15.46	7
General	Areas of modified forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This includes non-remnant and regrowth vegetation and considers recent clearing, canopy cover and patch size	115.20	7
General low	Areas of low quality modified forest or woodland potentially containing species that are known koala food trees, or shrubland with emergent food trees, that connect to higher quality general or preferred koala habitat. This includes non-remnant vegetation with very sparse coverage.	139.86	6

Offset suitability

The Project proposes a direct land-based offset to compensate for more than 100% of the residual significant impacts to koala. The offset area is considered suitable for the koala based on the presence of factors considered important in improving the condition and viability of existing habitat for the species (Table 7-3).

Table 7-3 Factors supporting offset area for koala

Factor	Present in Offset Area Property?				Comment
	Property A	Property B	Property C	Property D	
Presence of koala within or adjacent to property.	Yes	Yes	Yes	Yes (indirect evidence)	Local and regional presence of the koala supports the viability of this offset being utilised by the species
Presence of suitable habitat for utilisation impacted	Yes	Yes	Yes	Yes	Preferred, general and general low habitat present within the offset area which will be improved through restoration and habitat management measures.
Presence of critical habitat features (i.e. trees of Eucalyptus and aligned genera)	Yes	Yes	Yes	Yes	Habitat features for key life functions are present on each offset property, including dominance of locally important and ancillary koala habitat trees within remnant and regrowth REs. Restoration areas are largely cleared or have regrowth vegetation which will be improved through the offset.
Connectivity with surrounding adjacent habitat	Yes	Yes	Yes	Yes	Connectivity via riparian corridors and intact vegetation such as protected areas. Habitat corridors and linkages will be prioritised for restoration, particularly riparian zones.
Proximity to the impact area	Adjacent to the east	Adjacent to the east	Adjacent to the east	45 km north-west	The properties are sufficiently proximate to the impact area to support the population being impacted, and also supports the regional population within 50 km.
Location and configuration, which enables the area to be	Yes	Yes	Yes	Yes	The offset properties are configured with A, B and C together forming one large patch, and offset D of sufficiently square

Factor	Present in Offset Area Property?				Comment
	Property A	Property B	Property C	Property D	
appropriately managed to reduce threatening processes					configuration. This will ensure edge effects are minimised, and management measures are effective in reducing threatening processes.

Proposed offset

Offsets for the koala will include a direct land-based offset, as detailed below. The offset will include Properties A, B, C and D. Commonwealth OAG calculator results are provided in Table 7-4, which provides more than 100% offset of the residual significant impact per habitat utilisation.

Table 7-4 Commonwealth OAG values for koala per utilisation type

Attribute	Preferred habitat	General habitat #1	General habitat #2	General low habitat #1	General low habitat #2
Impact Area (ha)	15.46	115.20	115.20	139.86	139.86
Impact Area quality	7	7	7	6	6
Offset area (ha)	120	543	307	431	706
Properties	A	A, B	B, D	C	C
Quality					
Start quality	6	6	5	6	7
Future quality without offset	6	6	5	6	7
Future quality with offset	8	8	7	8	8
Time until ecological benefit (years)	20	20	20	20	20
Confidence in quality scores (%)	60	60	70	60	80
Raw gain	2.00	2.00	2.00	2.00	1.00
Adjusted gain	1.20	1.20	1.40	1.20	0.80
Risk of Loss					
Risk of loss without offset (%)	0	0	0	0	0
Risk of loss with offset (%)	0	0	0	0	0
Time over which loss is averted (years)	20	20	20	20	20
Confidence in risk scores (%)	60	60	70	60	80
Raw gain	0	0	0	0	0
Adjusted gain	0	0	0	0	0
Results					
Net present value	11.34	51.33	33.86	40.74	44.49
% impact offset	**104.82**	**63.65**	**41.99**	**48.55**	**53.02**
% impact offset per habitat utilisation	**104.82**		**105.64**		**101.57**

Greater glider

Residual significant impact

The residual significant impact to greater glider is characterised as foraging and denning habitat (preferred and potential future), and dispersal habitat (Table 7-5).

Table 7-5 Greater glider habitat

Utilisation type	Habitat definition (Ecosure, 2025)	Area (ha)	Condition score out of 10
Preferred foraging and denning habitat	Areas within the fragmented landscape that form contiguous patches of ground-truthed remnant and high value regrowth (HVR) eucalypt open forest and woodland vegetation communities containing greater glider food and den tree species. This includes all suitable remnant and regrowth vegetation ground-truthed within the Project Site, excluding vine thicket communities.	15.46	7
Potential foraging and future denning habitat	Non-remnant vegetation, containing greater glider food trees and future denning trees, in proximity to Preferred habitat and / or with substantial connectivity. This includes non-remnant and regrowth vegetation and considers recent clearing, canopy cover and patch size.	112.08	7
Dispersal Habitat	Areas of low quality modified non-remnant forest or woodland potentially containing some food tree species, that connect to Preferred or potential foraging and future denning habitat. This includes non-remnant vegetation with sparse coverage.	142.58	6

Offset suitability

The Project proposes a direct land-based offset to compensate for more than 100% of the residual significant impacts to greater glider. The offset area is considered suitable for the greater glider based on the presence of factors considered important in improving the condition and viability of existing habitat for the species (Table 7-6).

Table 7-6 Factors supporting offset area for greater glider

Factor	Present in Offset Area?				Comment
	Property A	Property B	Property C	Property D	
Presence of greater glider	Yes	Yes	Yes - adjacent	Yes	Local and regional presence of the greater glider supports the viability of this offset being utilised by the species
Presence of suitable habitat for utilisation impacted	Yes	Yes	Yes	Yes	Foraging, denning and dispersal habitat present within the offset area which will be improved through restoration and habitat management measures.
Presence of critical habitat features (i.e. trees of Eucalyptus and aligned genera)	Yes	Yes	Yes	Yes	Habitat features for key life functions are present within each offset property, including presence of a diversity of known food trees and hollow-bearing trees of suitable size for denning. Restoration

Factor	Present in Offset Area?				Comment
	Property A	Property B	Property C	Property D	
					areas are largely cleared or have regrowth vegetation which will be improved through the offset.
Connectivity with surrounding adjacent habitat	Yes	Yes	Yes	Yes	Connectivity via riparian corridors and intact vegetation such as protected areas. Habitat corridors and linkages will be prioritised for restoration, particularly riparian zones.
Proximity to the impact area	Adjacent to the east	Adjacent to the east	Adjacent to the east	45 km north-west	The properties are sufficiently proximate to the impact area to support the population being impacted, and also supports the regional population within 50 km.
Location and configuration, which enables the area to be appropriately managed to reduce threatening processes	Y	Yes	Yes	Yes	The offset properties are configured with A, B and C together forming one large patch, and offset D of sufficiently square configuration. This will ensure edge effects are minimised, and management measures are effective in reducing threatening processes.

Proposed offset

Offsets for the greater glider will include a direct land-based offset, as detailed below. The offset will include Properties A, B, C and D. Commonwealth OAG calculator results are provided in Table 7-7, which provides more than 100% offset of the residual significant impact.

Table 7-7 Commonwealth OAG values for greater glider per utilisation type

Attribute	Preferred foraging and denning habitat	Potential foraging and future denning habitat #1	Potential foraging and future denning habitat #2	Dispersal Habitat #1	Dispersal Habitat #2
Impact Area (ha)	15.46	112.08	142.58	142.58	142.58
Impact Area quality	7	7	6	6	6
Offset area (ha)	120	843	131	307	706
Properties	A	A, B, C	C	B, D	C
Quality					
Start quality	6	6	6	5	7
Future quality without offset	6	6	6	5	7

Attribute	Preferred foraging and denning habitat	Potential foraging and future denning habitat #1	Potential foraging and future denning habitat #2	Dispersal Habitat #1	Dispersal Habitat #2
Future quality with offset	8	8	8	7	8
Time until ecological benefit (years)	20	20	20	20	20
Confidence in quality scores (%)	60	60	60	70	80
Raw gain	2.00	2.00	2.00	2.00	1.00
Adjusted gain	1.20	1.20	1.20	1.40	0.80
Risk of Loss					
Risk of loss without offset (%)	0	0	0	0	0
Risk of loss with offset (%)	0	0	0	0	0
Time over which loss is averted (years)	20	20	20	20	20
Confidence in risk scores (%)	60	60	60	70	80
Raw gain	0	0	0	0	0
Adjusted gain	0	0	0	0	0
Results					
Net present value	11.34	79.69	12.38	33.86	44.49
% impact offset	**104.82**	**101.57**	**14.48**	**39.58**	**52.01**
% impact offset per habitat utilisation	**104.82**	**101.57**			**106.07**

Grey-headed flying-fox

Residual significant impact

The residual significant impact to grey-headed flying-fox is characterised as foraging habitat (Table 7-8).

Table 7-8 Grey-headed flying-fox habitat impacted

Utilisation type	Habitat definition (Ecosure, 2025)	Area (ha)	Condition score out of 10
Potential foraging	Includes important winter and spring flowering vegetation (including *Corymbia citriodora, E. crebra, E. tereticornis*)	130.65	7
Low quality Potential foraging	Includes important winter and spring flowering vegetation (including *Corymbia citriodora, E. crebra, E. tereticornis,* among other species of *Eucalyptus, Castanospermum, Corymbia, Grevillea, Melaleuca,* and *Syncarpia*), in in open non remnant woodlands with sparse vegetation cover, noting seasonal mass flowering does not occur and is less likely to be able to consistently support foraging in these areas.	139.86	6

Offset suitability

The Project proposes a direct land-based offset to compensate for more than 100% of the residual significant impact to grey-headed flying-fox. The offset area is considered suitable for the grey-headed flying-fox based on the presence of factors considered important in improving the condition and viability of existing habitat for the species (Table 7-9).

Table 7-9 Factors supporting offset area for grey-headed flying-fox

Factor	Present in Offset Area?			Comment
	Property A	Property B	Property C	
Presence of grey-headed flying-fox	Adjacent	Adjacent	Adjacent	Local and regional presence of the grey-headed flying-fox supports the viability of this offset being utilised by the species. A known camp is located approximately 25 km from the Project site, whilst a nationally significant camp is located approximately 35 km away.
Presence of suitable habitat for utilisation impacted	Yes	Yes	Yes	Foraging habitat is present within the offset area which will be improved through restoration and habitat management measures.
Presence of critical habitat features (i.e. trees of Eucalyptus and aligned genera)	Yes	Yes	Yes	Habitat features for key life functions are present within each offset property, including diversity and dominance of significant food trees in the nectar diet of GHFF, within remnant and regrowth REs.
Connectivity with surrounding adjacent habitat	Yes	Yes	Yes	Restoration areas are largely cleared or have regrowth vegetation which will be improved through the offset.
Proximity to the impact area	Adjacent to the east	Adjacent to the east	Adjacent to the east	Connectivity via riparian corridors and intact vegetation such as protected areas. GHFF are highly mobile species capable of travelling large distances.
Location and configuration, which enables the area to be appropriately managed to reduce threatening processes	Yes	Yes	Yes	The offset properties are configured with A, B and C together forming one large patch, and offset D of sufficiently square configuration. This will ensure edge effects are minimised, and management measures are effective in reducing threatening processes.

Proposed offset

Offsets for the grey-headed flying-fox will include a direct land-based offset, as detailed below. The offset will include Properties A, B and C. Commonwealth OAG calculator results are provided in Table 7-10, which provides more than 100% offset of the residual significant impact.

Table 7-10 Commonwealth OAG values for grey-headed flying-fox per utilisation type

Attribute	Potential foraging	Low Quality Potential Foraging #1	Low Quality Potential Foraging #2	Low Quality Potential Foraging #3
Impact Area (ha)	130.65	139.86	139.86	139.86
Impact Area quality	7	6	6	6
Offset area (ha)	861	233	118	706
Properties	A, B, C	C	B	C
Quality				

Attribute	Potential foraging	Low Quality Potential Foraging #1	Low Quality Potential Foraging #2	Low Quality Potential Foraging #3
Start quality	6	6	5	7
Future quality without offset	6	6	5	7
Future quality with offset	8	8	7	8
Time until ecological benefit (years)	20	20	20	20
Confidence in quality scores (%)	60	60	70	80
Raw gain	2.00	2.00	2.00	1.00
Adjusted gain	1.20	1.20	1.40	0.80
Risk of Loss				
Risk of loss without offset (%)	0	0	0	0
Risk of loss with offset (%)	0	0	0	0
Time over which loss is averted (years)	20	20	20	20
Confidence in risk scores (%)	60	60	70	80
Raw gain	0	0	0	0
Adjusted gain	0	0	0	0
Results				
Net present value	99.27	26.86	15.87	54.27
% impact offset	**108.55**	**32.01**	**18.92**	**64.67**
% impact offset per habitat utilisation	**108.55**			**115.60**

Glossy black-cockatoo

Residual significant impact

The residual significant impact to glossy black-cockatoo is characterised as foraging habitat (Table 7-11).

Table 7-11 Glossy black-cockatoo habitat impacted

Utilisation type	Habitat definition (Ecosure, 2025)	Area (ha)	Condition score out of 10
Potential breeding habitat	Areas with the potential to contain nesting locations were mapped based on a suitable distance from known foraging (1 km buffer), water sources (200 m dam and 1.5 km of a watercourse) (Mooney and Pedler 2005) and including trees known to be >8 m (based on lidar height data) (Cameron 2006, Glossy Black Conservancy 2022).	72.4 (108 trees)	7
Potential foraging habitat	Potential south-eastern glossy black-cockatoo foraging habitat was modelled as the ground-truthed extent of remnant and HVR vegetation which is most likely to contain large hollows and/or contains an understory of *Allocasuarina* or *Casuarina* food trees. This includes all remnant and HVR eucalypt forest and riparian REs verified within the Project Site (including REs 11.3.25, 11.5.20, 11.7.6, 11.11.4, 11.11.15, 11.12.3 and 11.12.6).	15.46	7

Offset suitability

The Project proposes a direct land-based offset to compensate for more than 100% of the residual significant impact to glossy black-cockatoo, combining land-based habitat with habitat feature offsets. The offset area is considered suitable for the glossy black-cockatoo based on the presence of factors considered important in improving the condition and viability of existing habitat for the species (Table 7-12).

Table 7-12 Factors supporting offset area for glossy black-cockatoo

Factor	Present in Offset Area?			Comment
	Property A	Property B	Property C	
Presence of glossy black-cockatoo	Adjacent	Adjacent	Adjacent	Local and regional presence of the GBC supports the viability of this offset being utilised by the species
Presence of suitable habitat for utilisation impacted	Yes	Yes	Yes	Presence of foraging resources, including recruitment of foraging trees. Presence of hollow-bearing trees in varying abundance in habitat management areas.
Presence of critical habitat features (i.e. trees of Eucalyptus and aligned genera)	Yes	Yes	Yes	Habitat features for key life functions are present within offset properties in varying quality and abundance. This includes presence of a diversity of Allocasuarina and Casuarina food tree species (*Allocasuarina littoralis*, *A. luehmannii*, *A inophloia* and *Casuarina cunninghamiana*) Large trees (live and dead) provide potential nesting habitat in habitat management areas and suitable drinking sites are present within proximality to nesting and foraging habitat. Habitat features (artificial hollows) will also be provided as breeding habitat offset.
Connectivity with surrounding adjacent habitat	Yes	Yes	Yes	Connectivity via riparian corridors and intact vegetation such as protected areas. GBC are highly mobile species capable of travelling large distances.
Proximity to the impact area	Adjacent to the east	Adjacent to the east	Adjacent to the east	The properties are sufficiently proximate to the impact area to support the population being impacted.
Location and configuration, which enables the area to be appropriately managed to reduce threatening processes	Yes	Yes	Yes	The offset properties are configured with A, B and C together forming one large patch. This will ensure edge effects are minimised, and management measures are effective in reducing threatening processes.

Proposed offset

Offsets for the glossy black-cockatoo will include direct land-based offset and habitat feature offset, as detailed below. The offset will include Properties A, B, and C, and habitat features will be offset by artificial hollows (likely nest boxes) within or adjacent to the foraging offset, and located adjacent to suitable water sources. Commonwealth OAG calculator results are provided in Table 7-13 for foraging habitat, and Table 7-14 for breeding habitat features, which provides more than 100% offset of the residual significant impact.

Table 7-13 Commonwealth OAG values for glossy black-cockatoo foraging habitat

Attribute	Potential foraging habitat
Impact Area (ha)	15.45
Impact Area quality	7
Offset area (ha)	85
Properties	A, B, C
Quality	
Start quality	5
Future quality without offset	5
Future quality with offset	7
Time until ecological benefit (years)	20
Confidence in quality scores (%)	70
Raw gain	2.00
Adjusted gain	1.40
Risk of Loss	
Risk of loss without offset (%)	0
Risk of loss with offset (%)	0
Time over which loss is averted (years)	20
Confidence in risk scores (%)	70
Raw gain	0
Adjusted gain	0
Results	
Net present value	11.43
% impact offset	**105.65**
% impact offset per habitat utilisation	**105.65**

Table 7-14 Commonwealth OAG values for glossy black-cockatoo breeding habitat features

Attribute	Breeding habitat
Description of habitat feature	Nesting hollows
Quantum of impact	108
Units	Count
Proposed offset	225
Properties	A, B, C
Quality	
Time horizon (years)	20
Start value	0
Future quality without offset	0

Attribute	Breeding habitat
Future quality with offset	225
Raw gain	225
Confidence in result (%)	50
Adjusted gain	112.50
Results	
Net present value	108.09
% impact offset	**100.09**
% impact offset per habitat utilisation	**100.09**

Confidence in quality gain and offset calculations

The proposed offset area will offset over 100% of the residual impact to the koala, grey-headed flying-fox, greater glider and glossy black-cockatoo resulting from the Project. Preliminary calculations assumed a 2 point gain in condition with an 80% confidence in results. Based on feedback from DCCEEW this confidence has been reduced to a range of 50 to 80% while the 2 point habitat gain has been retained across most offset areas and further justified in the Draft Offset Strategy (refer Appendix O). In some instances, the habitat gain has been revised to 1 point based on the habitat data.

Compliance with Offset Principles

The delivery of environmental offsets is to comply with the Environmental Offsets Policy (EOP). The EOP was developed with the purpose of improving environmental outcomes through the consistent application of best practice offset principles. The policy provides additional guidance on the identification and assessment of suitable offsets, helping to ensure that projects approved under the EPBC Act are consistent, transparent and achieve high quality environmental outcomes.

The policy outlines offset principles that govern the selection and nature of offsets and government assessment and decision-making. The Project's compliance with these principles is outlined in Table 7-15.

Table 7-15 Compliance with EOP Offset Principles

Offset Principles	Compliance
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The Offset Area contains vegetation that provides suitable habitat for each of the four MNES values. The Offset Area provides offsets in excess of minimum requirements for MNES values, which will result in a net conservation gain and overall improvement in the viability of the value being impacted. Management strategies will be designed within the Offset Area Management Plan (OAMP) to ensure that conservation outcomes are achieved, which are based on the recovery actions developed for the species. Threatening processes within the offset area will be mitigated and the habitat quality will be increased to provide for sustainable populations of the MNES values. In doing so the potential offset area will deliver a conservation outcome that will maintain and improve the viability of the affected MNES.
Suitable offsets must be built around direct offsets but may include other compensatory measures	The Offset Area will provide a direct land based offset and measurable conservation gain mitigating more than 100% of the impacts associated with the Project for each MNES value. The management of the offset area will also address the key priority actions for each species.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter	The Offset Area will provide a direct offset and measurable conservation gain of more than 100% of the impacts associated with the Project for the four MNES values. The potential offset has been

Offset Principles	Compliance
	developed using the OAG which incorporates the level of statutory protection of each protected matter being offset.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter	The offset area will provide a direct offset and measurable conservation gain of more than 100% of the impacts associated with the Project for each MNES value. The offset has been developed using the OAG, which uses the area of impact and the quality of habitat to assess the total quantum of impact to protected matters that needs to be offset. As such the offset area is of a size and scale that is proportionate to the unavoidable impacts on protected MNES values.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding	Potential risks to the success of the offsets will be detailed within the OAMP. Additional measures and remedial actions will be developed and will be implemented if any potential risks occur. In addition to this, a monitoring and reporting schedule will be developed which will assess the condition of the offset at regular intervals and trigger changes to the management strategies as required.
Suitable offsets must be additional to what is already required, determined by law or planning regulations, agreed to under other schemes or programs	The Offset Area does not have any existing formal conservation arrangement in place or existing requirements from other approvals that require the landowner to undertake conservation works. Current permitted land use across the offset area includes cattle grazing and agriculture.
Suitable offsets must be efficient, timely, transparent, scientifically robust and reasonable	Direct, land-based offset has been selected as the primary offset methodology for this Project as it is a robust and widely accepted approach, with a high degree of confidence in outcome. The proponent will undertake the following timing for this offset: • Prior to the commencement of the action secure a legal agreement with the landowner to protect the offset area. • Legally secure the offset area through the below mechanisms within 12 months of the commencement of the action. Prepare and implement an OAMP at the Offset Area for the duration of the approval to improve habitat for the four MNES values. Based on the OAG, ecological benefit will be achieved for these species within 20 years. The OAMP will be prepared to ensure the efficient and effective delivery of a conservation outcome in a timely manner.
Suitable offsets must have transparent governance arrangements, including being able to be readily measured, monitored, audited and enforced	The offsets will be secured using a Voluntary Declaration under the provisions of the VM Act. As per the requirements of the Voluntary Declaration, a detailed OAMP will be prepared. A monitoring program and reporting schedule will also be developed within the OAMP.

Offset revision

The offset area has been substantially revised and increased since the referral, and edits have included:

- removal of small isolated offset patches
- consolidation of offset areas into several large blocks
- incorporation of extra areas of suitable koala habitat into the offset.

The offset will provide improved habitat utilisation opportunities to the impact site.

Action Management Plans

Timeframes for Action Management Plans (e.g. bushfire, habitat restoration and pest management plans) will be amended to commence upon legal securement of the offset sites. Action Management Plans will include:

- Habitat Restoration Management Plan
- Pest Animal Management Plan

- Bushfire Management Plan.

Offset summary

The Offset Area has been assessed against the Commonwealth OAG for koala, greater glider, grey-headed flying-fox and glossy black-cockatoo habitat impacted by the Project and the EOP for delivery of a direct offset.

The Offset Area provides offsets in excess of minimum requirements for the four MNES values, which will result in a net conservation gain and overall improvement in the viability of the value being impacted.

Management strategies will be designed within the Offset Area Management Plan (OAMP) to ensure that conservation outcomes for MNES values are achieved, which are based on the recovery actions developed for the species. Threatening processes within the offset area will be mitigated and the habitat quality will be increased to provide for sustainable populations of each MNES value. In doing so the potential offset area will deliver a conservation outcome that will maintain and improve the viability of the affected MNES.

Section 8.0 Economic and Social Matters

8.1 Socio-economic assessment

The Guidelines require an analysis of both the positive and negative economic and social impacts of the proposed action, including:

- public consultation activities that were undertaken, and their outcomes
- projected economic costs and benefits of the Project, including the basis for their estimation through cost-benefit analysis or similar studies
- employment opportunities expected to be generated by the Project, including construction and operational phases
- mitigation measures to avoid causing a substantial impact (direct or indirect) on the local housing market
- landscape and visual amenity impacts and mitigation measures
- greenhouse gas (GHG) emissions and its economic impacts.

The Guidelines require the economic and social impacts of the proposed action be assessed at local, regional, and national levels. This assessment should include a comprehensive analysis of the relevant costs and benefits associated with alternative options to the proposed action.

The economic assessment (Ethos Urban, 2024) provides a comprehensive analysis of the anticipated economic impacts associated with the proposed action. The GHG assessment, prepared in tandem with this PER and provided as Appendix P, demonstrates transparency and alignment with environmental and economic performance expectations.

8.1.1 Existing demographic

The Project is located approximately 30 km west of Kingaroy and 8 km north-west of Kumbia within the South Burnett Regional Council Local Government Area (LGA). Key regional centres that may be a potential source of labour and materials for the Project include Dalby, Toowoomba and Chinchilla. The identified port for import of key WTG componentry, and accordingly the key transport hub for delivery is the Port of Brisbane.

The most recent census data (from year 2021) estimated a population of 32,996 in the South Burnett LGA, with a median age of 48. The region comprised 8,604 families, with an average of 1.9 families having children. The median weekly household income was $1,045, while the median weekly rent was $245. On average, each household owned two vehicles (ABS, South Burnett 2021 Cencus All Persons QUickStats, 2021). Of the population, 65% used a car as their primary mode of travel to work, 9.4% were not employed, and 9.5% worked from home (ABS, South Burnett 2021 Cencus All Persons QUickStats, 2021).

Towns in the immediate area are summarised in Table 8-1.

Table 8-1 Population centres in the community local to the Project

Town name	Population	Distance (km)	Direction	Access road	LGA
Kingaroy	10,545	23	East	Bunya Highway	South Burnett Region
Bell	502	29	SSW	Bunya Highway	Western Downs Region
Jandowae	1,004	38	WSW	Jandowae Connection Road	Western Downs Region
Kumbia	301	8	ESE	Bunya Highway	Western Downs Region
Wondai	1,972	40	NE	Bunya Highway	South Burnett Region
Proston	410	40	North	Proston Boondooma Road	South Burnett Region

Town name	Population	Distance (km)	Direction	Access road	LGA
Nanango	10,003	41	ESE	D'Aguilar / Burnett Highways	South Burnett Region
Yarraman	1,127	43	SE	D'Aguilar / New England Highway	Toowoomba Region
Cherbourg	1,194	47	NE	Cherbourg Road	Aboriginal Shire of Cherbourg
Murgon	2,220	50	NE	Bunya Highway	South Burnett Region
Blackbutt	779	56	SE	D'Aguilar Highway	South Burnett Region
Goomeri	677	64	NE	Burnett / Bunya / Wide Bay Highways	Gympie

Table 8-2 Demographic profile

	Kingaroy	South Burnett Regional Council
Population	10,545	32,996
Median Age	38	48
Motor Vehicles per Dwelling (two or more)	69%	70%
Unemployment Rate	4.7%	5.6%
Occupied Private Dwelling	90.7%	86.3%
Number of People per Dwelling	2.4	2.3
Internet Not Accessed from Dwelling	13.0%	18.8%

* https://abs.gov.au/census/find-census-data/quickstats/2021/LGA36630

8.1.2 Public consultation

The Proponent has undertaken direct, ongoing community and stakeholder engagement since May 2022. The purpose of this engagement is to build relationships with near neighbours and key stakeholders in relation to the Project as well as to inform Project design and development. The Proponent has led all engagement activities, with the objective that stakeholders and communities have direct interaction with the Proponent and that the Proponent can listen to stakeholders and members of the community feedback firsthand. The consultation includes several regular information sessions at multiple locations, one-to-one visits with Project neighbours upon request and a regular newsletter distribution consisting of Project updates and key dates.

This approach streamlines the consultation program and utilises a common approach to engagement, aiming to:

- ensure the development and implementation of engagement that is transparent and provides clear and consistent information on the Project
- reduce social risks associated with the Project, including stakeholder confusion or consultation fatigue
- establish and develop trust with key stakeholders
- afford the opportunity for meaningful participation in the assessment phases for the Project.

The Proponent has a dedicated community engagement team, comprising specialists trained in best practice methodologies under the International Association of Public Participation (IAP2). Various methods have been used to involve the different stakeholder groups based on the type of information being conveyed, level of feedback required, understanding of stakeholder needs regarding engagement, and identified stakeholder engagement preferences identified throughout consultation. These methods are detailed in Table 8-3.

Table 8-3 Engagement mechanisms

Method	Description and purpose
Letters	• letter of introduction • letters to impacted residents (immediate neighbours and surrounding community) • invitations to community drop-in sessions, pop-ups and other meetings
Surveys	• impact assessment and benefit sharing development • supplier database and contractor prequalification
Project updates	• Project introduction and overview • regular updates about Project development and construction
Media releases	• major Project milestones
Emails	• email database compiled during early community engagement and scoping phase (updated regularly) • targeted Project update emails • upcoming impacts (construction) • e-newsletters and invitations to events
Website	• platform for the wider community engagement may include: - Project documentation, as relevant to the development application - Project overview - news stories and videos of Project in the community - construction updates - fact sheets - opportunities (e.g., employment, community benefits, etc) - contact details - feedback and complaint form
Fact sheets	• draft and publish series of fact sheets, covering: - wind energy - wind farms and renewable energy - wind farms and the electricity grid - wind farm visual and noise impacts - wind farm health and safety - wind farm construction - frequently asked questions
Advertisements / flyers	• invitations to community information sessions • promote Project opportunities such as community benefits. • notify of upcoming construction impacts
Social media	• Project milestones and updates
Project briefings	• formal Project briefings to key stakeholders and government agencies
Personal meetings (as required)	• introduce the Project and team. • listen to individual concerns, interests, issues and gather preliminary feedback, scope potential impacts and opportunities – including sensitivities – to inform mitigation strategies, key messages and engagement approach and build understanding of engagement preferences
Community information and feedback sessions	• drop in/pop-up or town-hall style sessions to provide information, engage with community, answer questions • attendance at local events (e.g. field days, shows)
Site tours	• organised stakeholder tours of the Project Site

Table 8-4 below outlines the mechanisms that have been used to engage key stakeholder groups. The details of public consultation activities are provided in Table 8-5.

Table 8-4 Engagement tools and mechanisms

Key Stakeholder Group	Tools and mechanisms						
	Letters	Project updates / fact sheets	Media release	Emails / website	Project briefing	One-on-one meetings	Community sessions
Local Government				o	o	o	o
State Government				o	o	o	o
Federal Government				o			
Traditional Owners				o	o	o	
Neighbours (within 5km)	o	o		o		o	o
Community groups		o		o	o	o	o
Wider community		o		o			o
Local businesses		o		o		o	o
Local media			o	o			

Table 8-5 Details of public consultation

Timing	Item	Detail
Preparation		
April 2022	Project Information Sheet (2)	Distributed via mail drop. Call to attend advertised sessions, Project overview, map of Project Site area and info sessions details .
March 2023	Project Information Sheet (3)	Distributed via mail drop. Call to attend advertised sessions, Project overview, map of Project Site area and info sessions details.
Implementation		
Oct 2019 **Dec 2020** **May 2022** **Nov 2022** **Jul 2023** **Nov 2023** **May 2024** **Aug 2024** **Nov 2024**	Project briefing: South Burnett Regional Council	Introduction to Project. Discuss consultation process. Opportunity for Council to provide input into Project considerations. Councillor site visit.

Timing	Item	Detail
Mar 2023 **Ongoing**	Project briefing: Western Downs Regional Council	Introduction to Project. Discuss consultation process.
May 2022 **Oct 2022** **Apr 2023** **Jul 2023**	In-person drop-in information sessions at Ironpot, Kumbia In-person information sessions at Chahpingah (May & Oct 2022 only)	Advertised in newsletter, on website, letters to interested neighbours. Refer to summary of recorded feedback below.
Sep 2023 **Nov 2023** **March 2024**	In person Town-Hall style Q&A sessions (Kumbia Memorial Hall and Ironpot Farmers Hall)	Changed format of sessions in response to community feedback to facilitate a question and answer component. Themes/feedback more targeted in respect of roads and traffic impacts, noise, visual, water.
Mar 2022 **Apr 2022** **Sep 2022** **Jul 2023** **Nov 2023** **Dec 2023** **Feb 2024** **Mar 2024** **Apr 2024** **May 2024** **Jun 2024** **Jul 2024** **Aug 2024** **Oct 2024** **Dec 2024**	Regular newsletter distribution	Project updates including; key development milestone forecasts, updates on progression of approvals process including advance notice of public comment periods, timing of upcoming information sessions and information on any upcoming works in and around the Project Site.

8.1.2.1 Public consultation outcomes and results

For the initial phase of public consultation (via drop-in sessions from May 2022 through to July 2023), feedback from the consultation was documented and categorised to enable consistent tracking and recording of community feedback. The tables below detail the categories that each relevant interaction is categorised under, and the number of interactions against that category.

Since July 2023, in response to community feedback, the Proponent amended the format of consultation sessions from an informal, ‘drop-in’ style session which encouraged personable, small group conversations in favour of larger, town-hall style question and answer styled sessions with key Project representatives present. Due to the change in format of the sessions, it was not possible to log attendance records or record the feedback for the ‘town-hall’ style sessions in the same manner as for the ‘drop-in’ sessions, therefore Table 8-6 and Table 8-7 only present the results for the ‘drop-in’ sessions held from May 2022 to July 2023.

Table 8-6 Attendance at community information sessions – May 2022 to July 2023

Date	Attendance
5 May 2022	7 attendees at Ironpot Hall
6 May 2022	18 attendees Kumbia Memorial Hall
19 May 2022	13 attendees at Chahpingah Hall, Burrandowan Racetrack
18 October 2022	55 attendees at Kumbia Memorial Hall, 20 attendees at Ironpot Farmer's Hall
19 October 2022	6 attendees at Chahpingah Hall, Burrandowan Racetrack
19 April 2023	23 attendees at Kumbia Memorial Hall, 10 attendees at Ironpot Farmer's Hall
10 July 2023	29 attendees at Kumbia Memorial Hall, 19 attendees at Ironpot Farmer's Hall

Table 8-7 Interactions for community information sessions - May 2022 to July 2023

Category	Number of interactions
Question	27
Impact - Traffic	22
Impact - Visual	20
Impact - Unspecified	19
Feedback - Request	17
Impact - Noise	16
Enquiries - Supplier	15
Feedback - Engagement - Adequacy	12
Feedback - Engagement	10
Enquiries - Benefit Sharing - Recommendation	9
Impact - Devaluation	9
Enquiries - Benefit Sharing	8
Enquiries - Sponsorship	8
Impact - Accommodation	8
Impact - Construction	8
Impact - Ecological	6
Impact - Land Use	6
Impact - No Impact	6
Enquiries - General	4
Enquiries - Employment	4
Enquiries - Sponsorship - Provision	4
Impact - Access	4
Impact - Traffic - Danger	3
Enquiries - Benefit Sharing - Community Fund	2
Enquiries - Project Impacts	2
Feedback - Compliment	2

Category	Number of interactions
Feedback - Engagement - Ease of Access	2
Feedback - Engagement - Frequency	2
Impact - Cumulative	2
Impact - Decommissioning	2
Impact - Electromagnetic Interference	2
Impact - Traffic - Damage	2
Impact - Water	2
Land - General	2
Land - Agreement	2
Land - Negotiation	2
Enquiries - Requesting meeting	1
Feedback	1
Feedback - Behaviour - Contractor Behaviour	1
Feedback - Behaviour - Staff Behaviour	1
Feedback - Objection - Stated Intent	1
Impact - Aviation	1
Impact - Dust	1
Impact - Fire Risk	1
Impact - Social	1
Impact - Waste	1
Unrelated to Project	1

The interactions were categorised in accordance with the definitions presented in Table 8-8.

Table 8-8 Definitions of categories

Definitions
Enquiries
Enquiries - Benefit Sharing: General enquiry about benefit sharing arrangements
Enquiries - Benefit Sharing - Community Fund: Enquiry about community fund arrangements/development
Enquiries - Benefit Sharing - Recommendation: Recommendation about benefit sharing development
Enquiries - Project Impacts: Enquiry about Project impact (without suggestion of real or perceived impact)
Enquiries – Employment: Enquiry about employment opportunities
Enquiries – Requesting Meeting: Request for a meeting with Project team
Enquiries - Sponsorship: Proposal for community short term sponsorship
Enquiries - Sponsorship - Provision: Confirmed sponsorship
Enquiries - Sponsorship: Proposal for community short term sponsorship
Enquiries - Supplier: Enquiry from potential supplier (including construction and asset management)
Feedback

Definitions
Feedback – Behaviour – Contractor Behaviour: Feedback about contractor behaviour in development
Feedback – Behaviour – Contractor Staff: Feedback about staff behaviour
Feedback - Compliment: Positive feedback about Project, process, or outcomes of consultation
Feedback - Engagement: Feedback about public engagement for the Project
Feedback – Engagement - Adequacy: Feedback about the adequacy or quality of consultation
Feedback – Engagement – Ease of Access: Feedback the availability of Project information
Feedback – Engagement - Frequency: Feedback about the frequency or timing of consultation
Feedback – Objection – Stated Intent: Statement of intent to object to Project
Feedback - Request: Actionable request for information, Project change or engagement
Impact
Impact - Construction: Reported perceived future construction impact
Impact – Access: Impact to private or public access due to construction or operations
Impact – Accommodation: Impact to accommodation availability or price
Impact – Aviation: Impact to aviation activities including private air strips
Impact - Cumulative: Reported perceived future impact from multiple proximal developments or existing projects
Impact: Decommissioning: Impact due to decommissioning activities
Impact - Devaluation: Reported perceived future or present impact to property value
Impact – Dust: Impact to air quality due to dust disturbance during construction
Impact – Ecological: Impact to environmental biodiversity or biosystems
Impact - Electromagnetic Interference: Reported perceived future impact from EMI
Impact - Fire Risk: Reported perceived future impact from increased fire risk
Impact – No Impact: Statement of nil impact from Project
Impact - Noise: Reported perceived future impact from noise pollution (either excessive or compliant levels)
Impact – Land Use: Impact to the current or future use of private or public land
Impact – Social: Impact to social amenity, social cohesion or community identity
Impact - Traffic: Reported perceived future or present impact to local traffic flows
Impact - Traffic - Damage: Reported perceived future impact to roadways due to traffic
Impact - Traffic - Danger: Reported perceived future danger to people or property due to traffic
Impact - Visual: Reported perceived future impact to visual amenity from public or private viewpoints
Impact - Waste: Reported perceived future impact due to Project waste
Impact - Water: Reported perceived future impact to existing waterways, access to water or use of water by the Project
Land
Land - Agreement: Communication about details of executed agreement
Land - Negotiation: Communication about negotiation (for land access, lease, purchase etc.)
Other
Question: Qualifying classification to identify question about impact from report of impact

8.1.3 Summary of key feedback themes

8.1.3.1 Visual impact

The Project has responded to this concern by revising the layout to include fewer turbines in proximity to where visual impact has been reported from community, and proposing a benefit program for un-associated neighbours based on proximity.

8.1.3.2 Noise impacts

In addition to the Project compliance to noise limits under State Code 23, the Project has responded to this concern by seeking to communicate relevant points of difference between already constructed wind farms and the Project, such as differences in turbine size, design and turbine supplier. Additionally, the Proponent has undertaken baseline noise monitoring for comparative purposes during the operational phase.

8.1.3.3 Traffic (construction) impacts

Feedback relating to Traffic includes varied concerns including noise , visual impact, dust, security, access, road safety and damage to existing roads. The Project has responded to this concern by reducing the roads proposed to be used by the Project, working with Council to select routes and negotiate a Road Infrastructure Agreement for required upgrades, working with the local community to further understand and manage specific impacts, and undertaking baseline dust monitoring on key roads for comparative purposes during construction

8.1.3.4 Communication with Project

Feedback about the communication between Project neighbours and the Project was recorded early in the development phase. This feedback involved the provision of information via available mail services, as well as the accessibility of Project representatives to engage with interested or impacted community members. The Project has responded to this concern by employing additional postage methods to ensure that Project information reaches impacted Project neighbours, increasing the amount of public information sessions during development and undertaking one-on-one consultation with concerned neighbours of the Project wherever the request has been made.

8.1.3.5 Opportunities

The following suggestions have been received throughout community consultation and will be considered in both the final design of any benefit sharing programs for the Project, as well as in the provision of ongoing short-term sponsorships throughout development:

- annual payments to Project neighbours
- ongoing support of local sporting and community facilities (Kumbia Race Club, Ironpot Hall)
- a community fund to service the broader region and provide support for community-led leadership, community resilience and benefit programs.

The Proponent is committed to the development of community benefit sharing programs for the Project. If developed, the Project will contribute over 10 million dollars to the community through a range of proposed benefit sharing programs over the life of the Project.

The final details will be confirmed throughout Project development, however, include the below Neighbourhood Shared Benefit Scheme and Community Futures Fund, in line with the Clean Energy Council Guidelines for Benefit Sharing (2019).

Furthermore, the Proponent is committed to local employment and procurement, and is developing a community supplier register to share details of interested local contractors and suppliers with the Project's lead construction contractor.

8.1.3.6 Neighbour Shared Benefit Scheme

The RES Neighbour Shared Benefit Scheme (SBS) will provide annual ongoing payments to qualifying neighbours of the Project based on a clear set of distance-based criteria. The SBS allows Project neighbours to share in the benefits of renewable energy projects with no limits or conditions, starting at the commencement of construction. Eligibility will be tied to properties so that benefits pass to new property owners.

8.1.3.7 Community Futures Fund

In addition to the SBS, the Project intends to provide broad benefit to the community and is in discussions with community groups and associations to ensure that ultimate funding arrangements address the current and future challenges of the community and provide benefit in a meaningful and long-term manner, informed by the community.

More recently since the inception of the town-hall sessions, concerns raised were noted and the Proponent has either actioned or is in the process of actioning. For example, the following specific workstreams have been completed (or are underway) in response to the concerns raised:

- further background noise monitoring at nearby receptors (ongoing)
- baseline dust monitoring in the Project surrounds, mainly on the proposed transport routes
- completion of a desktop hydrological report to identify proposed water sourcing options for construction non-potable water supply establishing the Community Consultative Committee where community members and members of the Project team meet each quarter with to discuss Project updates and key concerns.

The Community Consultative Committee encourages centralised communication between the Project personnel and community members during latter stage development and throughout construction phases.

8.1.4 Community sponsorships

The Proponent has tried wherever possible to provide positive impact in the local community. Throughout the development of the Project, the Proponent has contributed to several local community organisations and initiatives including the following:

- Bunya Mountains Community Association Inc.
- Burrandowan Picnic Race Club
- Coolabunia State School
- Durong South State School P & C
- Ironpot Farmers Hall Committee
- Ironpot Wild Dog Trapping Syndicate
- Kingaroy Bowls Club Inc.
- Kingaroy Boxing Club
- Kingaroy State High School
- Kumbia Hall
- Kumbia Lutheran Church
- Kumbia Sport and Recreation Association Inc.
- Kumbia State School P & C
- Kumbia Kindergarten
- Kumbia Memorial School of Arts Inc.
- Maidenwell Music Mix
- Red Earth Community Foundation South Burnett
- South Burnett Saints AFL Club
- The HerKind Project Inc.
- Toowoomba and Surat Basin Enterprise.

The Proponent will continue to be involved with local organisations and initiatives throughout Project construction and operation.

8.1.5 Key stakeholders

Regulator consultation has been undertaken (and is ongoing) with the following regulators:

- Queensland Government including SARA and DSDIP. SARA also advocates the interests of the relevant Queensland Government departments, being:
  - DETSI
  - DTMR
  - DPI
  - DNRMMRRD
  - DLGWV.
- Powerlink Queensland
- Australian Energy Market Operator
- South Burnett Regional Council
- Western Downs Regional Council
- Rural Fire Service
- Queensland Fire and Emergency Services
- Coexistence Qld.

More information on consultation and specifically consultation to date is provided in Section 5.1.2.

8.2 Native Title and Cultural Heritage

The *Aboriginal Cultural Heritage Act 2003* (ACH Act) seeks to provide effective recognition, protection and conservation of Aboriginal cultural heritage, including artefacts and cultural sites of significance to Aboriginal people. The Project Site may contain artefacts and cultural sites that are of significance to Aboriginal people. Cultural Heritage Management Plan (CHMP) will be required with the following Registered Native Title Bodies Corporate (RNTBCs):

- Auburn Hawkwood People Aboriginal Corporation (AHPAC)
- Wakka Wakka Native Title Aboriginal Corporation (WWNTAC).

Consultation has been undertaken and remains ongoing with these Indigenous stakeholders, AHPAC ongoing since 2019 and WWNTAC ongoing since 2020.

Under Section 23 of the ACH Act, a person who carries out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal Cultural Heritage (the “cultural heritage duty of care”).

The *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* (DCCEEW 2023) was reviewed alongside the consultation activities completed thus far and those proposed for the Project. Details of how consultation and engagement with First Nations People aligned with the statutory obligations and DCCEEW’s expectations of the Proponent are provided in Table 8-9.

Table 8-9 First Nations People engagement

Statutory obligation / expectation	How the Proponent met this requirement
Ensuring cultural safety	The Proponent has strived to create an environment where cultural safety is assured. The Proponent is not aware of any circumstances where this has not occurred.

Statutory obligation / expectation	How the Proponent met this requirement
Building and maintaining trust	Since the Project inception, building and maintaining trust has been a strong focus for the Proponent. This trust is evident by the agreed CHMP with AHPAC. Positive collaboration is continuing as part of reaching an agreeable CHMP with WWNTAC.
Engaging early and often	The Proponent has engaged regularly with First Nations Parties since 2019 and has regularly maintained contact with both RNTBCs (AHPAC and WWNTAC) to keep them informed of Project updates and progress and involved in site investigations and surveys.
Negotiating suitable timeframes	The Proponent has created a consultation environment that supports timeframes that are mutually agreeable.
Statutory obligations to invite comments under the EPBC Act	The Proponent has fulfilled the statutory obligations and will continue to do so.
Engagement guidance developed by Australian Government agencies	The Proponent's engagement strategy is Project specific and was developed to ensure best practice is implemented.
Other useful sources of information such as National Indigenous Australians Agency, National Native Title Tribunal, Australian Institute of Aboriginal and Torres Strait Islander Studies, and Indigenous Land and Sea Corporation	The Proponent regularly explores relevant databases of information to support contemporary engagement actions and ensure it is appropriately informed on relevant matters.
Other legislation such as *Native Title Act 1993* (Cth) and the *Protection of Moveable Cultural Heritage Act 1986* (Cth)	The Proponent is aware of its obligations under other legislation and duly responds to changes that may arise.

The Proponent is a wholly owned subsidiary of RES Australia Pty Ltd, itself a part of the RES Group, a global renewable energy company, that is forthright in its commitment to working collaboratively with First Nations People. The RES 'Power for Good' sustainability report (2023) provides the following information on the value and importance of relationships with First Nations People that is embedded into the operations:

Our culture of care extends to the environment and all stakeholders. Through our commitment to community relations, we seek to demonstrate this through respectful engagement and collaboration with First Nations stakeholders, whose ancestral lands we live and work on.

Increasing our understanding, value and recognition of First Nations cultures, histories, knowledge and rights, are key to building respectful relationships with First Nations stakeholders and creating a more wholistic and inclusive approach to our work, in the true spirit of "Power for Good."

This year we have made significant steps in collaborating and building relationships with First Nations stakeholders in Australia.

The specific content around negotiations and agreements is confidential. However, the Proponent supports the best practice outlined in the *Clean energy agreement making on First Nations land: What do strong agreements contain?* (O'Neill *et al.* 2021) publication and is confident that the agreed terms suitably recognise the contributions of First Nations People and impacts on First Nations People.

In November 2024, the Proponent reached agreement with the Auburn Hawkwood People Aboriginal Corporation and a CHMP came into effect. The terms of this CHMP are confidential.

Throughout consultation with both RNTBCs to date, the Proponent is committed to facilitate benefit sharing schemes for both RNTBC parties. This will include capacity-building workshops to assist with increasing the number of RNTBC members that are qualified to work on renewable energy projects, employment opportunities on the Project for individuals and businesses, facilitation of apprenticeships

and/or scholarships, engagement of RNTBCs to provide cultural services such as welcome to Country and cultural competency training for the construction workforce.

The Proponent will also financially support RNTBC employment of a liaison officer to assist with communication and implementation of benefit sharing application throughout construction and operation of the Project.

The Proponent will generate employment opportunities during both the construction and operation phases, contributing to local and regional economic development. Additionally, regular consultation will be maintained throughout the entire Project lifecycle to ensure ongoing engagement and communication with Indigenous stakeholders.

The Proponent is consulting the Wakka Wakka Native Title Aboriginal Corporation and anticipates a similar CHMP with confidential terms will be reached in the near future.

8.3 Potential impacts

8.3.1 Local and regional

The impact of the Project on the existing agricultural activity across the Project area is likely to be small, due to the following factors:

- Only a very small proportion of agricultural land, approximately 6% of the approximate 17,500 ha Project Site, will be used by permanent infrastructure e.g. internal access roads, siting of turbines and other infrastructure requirements.
- The land is principally used for grazing associated with beef production, and this activity can continue largely as normal across the Project Site (minus the share of land required for permanent infrastructure).

An accommodation analysis completed as part of the State approval indicated capacity in the broader locality may be stretched to cater for up to 140 FTE construction workers at the Project's peak, as well as construction workers from concurrent projects seeking accommodation in the region. Overall, the Project has the potential to place pressure on the local housing market during all phases, however ongoing public consultation and community involvement will provide feedback to the Proponent on the local impacts that may be attributable to the Project.

Landscape and visual impact was assessed as part of the State Development Application approved by the QLD Government. Potential impacts associated with the following Project components were assessed:

- construction of the temporary compound with fencing and civil works
- construction of turbine foundations and cable reticulation
- progressive transportation of the wind farm components, movement of plant, vehicle movements including load deliveries to site, on-site storage of wind farm components
- construction of electricity substation and battery energy storage system
- underground and overhead cabling and associate temporary access routes
- progressive installation of the turbines and permanent wind monitoring towers
- machinery and material storage including temporary laydown and stockpile areas
- reinstatement and rehabilitation works
- operational wind turbines with hardstands and access tracks
- meteorological masts (three permanent and four temporary)
- medium voltage overhead cable reticulation
- high voltage transmission lines
- two substations, switching station and battery energy storage system

- two permanent operations and maintenance facilities including control centre, offices, workshop, warehouse, water tanks, septic systems and parking
- decommissioning that would involve temporary contractor compounds, fencing, plant and vehicle movements, laydown areas, machinery storage and material storage as part of dismantling all above ground structures and reinstatement of disturbed ground.

For the operational period, the assessment identified that there would be no significant effects on landscape character. Similarly, there were no major significant effects on views identified. However, there were significant impacts on four representative viewpoints which have the potential to effect rural residents and visitors in Kumbia or travelling along the Bunya Highway or Bunya Mountains Road. Mitigation measures for these potential landscape and visual impacts are detailed in Section 8.3.3.

Throughout the operational period, the Proponent will be responsible for implementing a suitable maintenance regime that includes preventative measures. This will include industry standard periodic assessments of WTG components, including blades, to ensure the condition and operation is commensurate with design specifications and remains fit for purpose. These commitments will significantly reduce the potential occurrence of issues, including those considered unlikely, such as blade erosion and blade vibration frequency. Furthermore, ongoing maintenance will identify structural or aesthetic issues as they arise, thereby allowing due or preventative maintenance to be undertaken. The wind turbine componentry, such as the blades, will therefore remain fit for purpose and not lead to the exposure of the underlying materials to the elements.

8.3.2 National

At the national level, the impacts on socio-economic values attributable to the Project are anticipated to be minimal due to:

- South Burnett comprising approximately 0.13% of the entire national population.
- In 2021, 47.2% of the South Burnett population aged 15 and over reported being part of the labour force, representing just 0.10% of Australia's overall employment rate of 61.1%. (ABS, 2021a).
- The Project is expected to support additional jobs through the employment multiplier effect. Using an industry-standard multiplier of 2.9 for the electricity sector, approximately 35 permanent full-time equivalent (FTE) jobs would be indirectly created at the state and national levels, with some generated locally through existing supply chains.
- Operational phase employment represents new long-term employment opportunities (i.e. 30 years) at a local, regional and national level.

Therefore, national scale impacts are considered very minor in the socio-economic space.

The Project contributes to the advancement of the national renewable energy industry by fostering the development of a skilled workforce equipped to support the continued growth of renewable energy initiatives. This progression enhances industry expertise and strengthens Australia's capacity to meet future renewable energy demands, promoting sustainable development and a transition to cleaner energy sources.

8.3.3 Mitigation measures

The Proponent will require the construction contractor to appropriately consider the available temporary accommodation when scheduling works.

The Proponent seeks to avoid causing a substantial impact (direct or indirect) on the local housing market. It is anticipated that at the time of construction there will be sufficient existing accommodation available across the region. Due to the fluctuating nature of accommodation availability, the Proponent will continue to routinely review the availability of existing accommodation in the lead-up to construction. This includes working with key stakeholders such as South Burnett Regional Council. Discussions with Council are underway, and these are focused on how construction activities can be managed with as little adverse impact on the accommodation in the area as possible.

As part of mitigating impacts on landscape character and views, the Assessment approved by the QLD Government, identified the following opportunities:

- During detailed design, design facilities to minimise the impact on the current land use, including minimise land take / loss of productive rural land (the Proponent has and will continue to reduce overall footprint as part of design iterations wherever practicable).
- Minimise tree and other vegetation removal.
- Apply a finish to the turbine towers, nacelles and blades to avoid potential visual impacts from blade glint.
- Consult with affected sensitive land use receptors within 5 km of the closest turbine to discuss individual mitigations that may be adopted.
- Implement a construction management plan that links with the rehabilitation requirements applicable to land subject to temporary construction impacts.

The Proponent will implement these mitigation measures as part of minimising impacts on the landscape character and visual amenity.

8.3.4 Costs and benefits

As detailed below, the Project is expected to provide social and economic benefits to the local community:

- The construction phase of the Project will involve approximately $1.5 billion in investment, of which $150 million is estimated to be retained in the Project Area.
- Generation of up to 440 FTE jobs during the 30-month construction phase, including 100 direct and 55 indirect FTE positions.
- Generation of up to 47 direct and indirect FTE jobs during operation and maintenance of the wind farm.
- An estimated 19 FTE permanent local jobs (direct and indirect) will be created through the operational phase of the Project, and wage spending associated by these additional jobs will benefit local businesses and communities. The extent of retained local spending equates to $1.2 million per annum (pa) (2023 dollars) in Year 1 of operations.
- Non-local construction workers living in the local area would be expected to inject approximately $9.7 million in additional spending to the regional economy over the 30-month construction phase.
- Supporting agriculture by improving land accessibility and providing diversified revenue to farms involved in the Project as host landholders.
- The Project has the capacity to supply sufficient clean energy to power approximately 170,000 homes and reduce CO_2 emissions by 1M Tonnes pa.
- Annual payments to host landowners or neighbouring landowners are likely to be reinvested into local farms.
- The Project could also potentially support small-scale tourism initiatives, such as viewing opportunities for visitors to the region. In the longer-term, potential exists for the Project to form part of organised tours to renewable facilities in the broader South Burnett region.

Construction-related jobs are expected to be associated with a wide-range of on and off-site activities, including:

- structural concrete foundations
- earthworks
- roads and access tracks
- fencing
- landscaping
- vehicle and equipment hire

- trade services
- security
- office cleaning
- waste disposal
- building maintenance
- foundation laying
- electrical transformer installation
- crane works
- cabling
- temporary site facilities (power, water, telecommunications)
- transport of components/workers.
- local/ regional professional services might include:
  - civil engineering
  - mechanical engineering
  - environmental engineering and specialist consultants
  - employment agencies
  - electrical engineering
  - legal and financial services.

8.4 Greenhouse gas

The EPBC Act provides a legal framework to protect and manage flora, fauna, ecological communities and heritage places that are MNES.

GHG emissions and climate change are not matters regulated by the EPBC Act as MNES. However, GHG emissions may be considered where those emissions will have or are likely to have a significant impact on a protected matter. GHG emissions are both direct and indirect consequences of the Project and have been presented in a standalone report (refer Appendix P) as part of the submitted PER.

The PER Guidelines requested the following:

- an evaluation of Scope 1 and Scope 2 GHG contributions during the construction phase of the Project
- estimate of the reduction in direct GHG emissions once the Project becomes operational
- estimation of the time required for the Project to displace its emissions.

The GHG assessment described and estimated the Scope 1 GHG emissions anticipated from the construction of the Project. Wind farms do not generate significant GHG emissions during their operation because they rely on wind, a renewable energy resource, to produce electricity. It is not expected that Scope 1 and Scope 2 operation phase emissions would be significant and they were not discussed further in the assessment.

Additionally, the assessment provided an estimate of the reduction in direct GHG emissions once the Project becomes operational and estimated the time required for the Project to displace the Scope 1 emissions generated during construction.

The emissions inventory for the construction of the Project for this assessment was populated based on information provided by the Proponent. The two key sources of emissions during the construction phase were identified as land clearing and fuel combustion from construction vehicles. The estimated GHG emissions from these two activities are presented in Table 8-10.

Table 8-10 Summary of GHG emissions associated with the Project's construction

Project activity	Scope	Total emissions (t CO_2-e)
Construction vehicles	1	33,866
Land clearing	1	249,499
	Total Scope 1	**283,365**

To determine the displacement period, the emissions intensity (kg/MWh) for both existing individual non-renewable energy sources and for the QLD grid as a whole was determined. The emissions avoided per year for each existing energy source was estimated assuming each energy source produced the same quantity of power as the Project (P50 of 1,309,990 MWh annually). Using the emissions avoided value (t CO_2-e per year) the displacement time in months was determined based on the estimated construction phase emissions (283,365 t CO_2-e) for the Project.

The displacement period was estimated considering a variety of existing individual non-renewable energy sources and for the QLD grid as a whole, including the contribution from renewable energy providers. Overall, the determination of displacement period using the emissions intensity for existing individual non-renewable energy sources was identified as the most relevant approach for addressing the PER Guidelines requirements.

Table 8-11 shows the months required to displace Project construction emissions based on the individual power generators considered. Based on this approach the displacement period could be as fast as 3 months or as slow as 7 months (listed in Table 8-11).

Table 8-11 Months required to displace Project construction emissions based on existing individual power generators

Generator	Generator type	Fuel / technology type	2024-25 emissions intensity (kg/MWh)	Emissions avoided per annum (t CO2-e per year)	Approx. months for Project to displace emissions based on emissions intensity
Mt Stuart	OCGT	Liquid Fuel	1,002	1,311,608	3
Swanbank E Gas Turbine	CCGT	Gas	394	515,742	7
Millmerran	Steam Super Critical	Black Coal	825	1,079,917	4
Braemar	OCGT	Gas	617	807,647	5

Table notes:
OCGT = open cycle gas turbine
CCGT = combined cycle gas turbine
Source: AEMO - 2024 ISP Inputs and Assumptions Workbooks

To determine the reduction in GHG emissions once the Project is operational, the emissions which would be generated by other existing energy sources to produce the same quantity of power as the Project were calculated. Emissions were calculated for individual existing non-renewable power generators in QLD (refer Table 8-11) and the QLD grid for the current year (2024) and future years (2028 to 2030).

Based on the range of emissions calculated for individual existing non-renewable power generators and the QLD grid as a whole, the annual emissions reduction could be as low as 471,236 t CO_2-e or as high as 1,311,608 t CO_2-e.

8.5 Employment opportunities

The assessed area has an unemployment rate of 4.3%, higher than Queensland's overall rate of 3.8% as of June 2023. Approximately 5,260 people are unemployed in the Project Area, while South Burnett LGA has a higher unemployment rate of 6.7%, with 1,000 people unemployed. The construction of the Project may create short-term job opportunities for the local workforce, including those currently unemployed if their skills match the needs. A small number of ongoing jobs will also be supported once the facility is operational.

The Project will offer opportunities for local businesses and workers in the Project Area, particularly those with skills and resources in the construction sector. Additionally, the Project may support small-scale tourism initiatives, such as visitor viewing opportunities. In the long term, there is potential for the Project to be included in organised tours of renewable energy facilities across the broader South Burnett region.

The procurement process for the Project will encourage participation from local businesses within the South Burnett LGA, wherever feasible. This strategy may include self-imposed targets for local procurement and this will lead to increased opportunity. Overall, the strategy aims to not only maximise the positive economic impact within the region but also to directly benefit the communities most affected by the Project. The Proponent maintains a register of prospective local contractors that have shown interest in working on the Project throughout consultation undertaken to date. By prioritising local suppliers, contractors, and service providers, the Project will foster regional growth and contribute positively to communities that may experience varied socio-economic conditions. In addition, by promoting and supporting social equity, the Project can contribute to strengthening community resilience and long-term economic stability in the area.

Throughout the construction phase, the Project will create a significant number of direct and indirect employment opportunities. Specific to Indigenous employment opportunities, consultation between the proponent and the Native Title parties includes opportunity for indigenous businesses and/or individuals to be involved with the construction and operational phases. Direct employment will be generated through on-site construction roles, including skilled and unskilled labour positions. Indirect employment opportunities will also emerge as local businesses supply goods, materials, and services essential to the construction process. This will include industries such as transportation, logistics, equipment rentals, and various support services. The multiplier effect of these activities will not only boost job creation but also stimulate the broader local economy, offering a sustained positive impact even after construction concludes.

Section 9.0 Conclusion

9.1 Conclusion

The Project will involve the construction, operation and decommissioning of a wind farm located in Ironpot, Queensland. The wind farm will comprise a maximum of 97 WTGs with an overall rated capacity of up to 436.5 megawatts of clean and renewable electricity to supply to the NEM. In addition to the WTGs, there will be upgrades to existing roads and tracks, new internal site access tracks, a site compound, substations, switching station, electrical reticulation, operations and maintenance facility, batch plant, washdown area, borrow pits, meteorological masts and a helipad.

The Project will be established over freehold rural properties, State land and reserves, totalling approximately 17,500 ha. The Project Site comprises the planning corridor, an approximately 1,946 ha subset which contains a clearing footprint (872 ha) for the proposed infrastructure. Except for where permanent infrastructure is proposed, the balance of the Project Site will continue to provide habitat value alongside the existing cattle grazing rural use. In the short, medium and long-term the overwhelming majority of the Project Site will continue to be available for farming and widespread wildlife utilisation.

The Queensland Government-issued approval of the Project under the *Planning Act 2016* and Planning Regulation 2017 represents a critical milestone. The approval is accompanied by a comprehensive framework of stringent conditions aimed at ensuring the Project aligns with community expectations and minimises potential environmental and social impacts. These conditions encompass detailed assessments, management plans, compliance reporting, and ongoing monitoring across various environmental and operational domains. With requirements mirroring those often conditioned in approvals granted under the EPBC Act, including robust compliance measures and publication obligations, this approval provides confidence that the Project will proceed with rigorous oversight and appropriate control strategies throughout its lifecycle.

The Project was referred for assessment under the EPBC Act (EPBC 2023/09643), allowing public consultation from 6 to 20 November 2023. On 4 December 2023, DCCEEW confirmed that approval under the EPBC Act was required, with a PER decided as the assessment approach. Since the referral decision, minor changes have been made to the Project layout as part of the design progression. These adjustments include reconfiguration of the main site entrance for safe access during all Project phases, and the relocation of four WTGs and associated infrastructure to address structural loading constraints and reduce impacts on MNES habitats. Collectively, these refinements have led to a significant reduction in the disturbance area, particularly concerning MNES habitats and remnant vegetation, while improving overall Project efficiencies. The proponent brought forward a significant volume of design work normally carried out during the construction phase to the development phase (civil and electrical) to underpin these refinements and allow a high degree of certainty of the proposed impacts.

As part of delivering the Project, the Proponent is committed to continually enacting opportunities to reduce the footprint of the wind farm whilst maintaining a safe, stable and non-polluting landform. This has occurred concurrent with the preparation of this PER, and results in a reduced clearing footprint of approximately 18% or 190 ha since the EPBC Act referral in November 2023.

The Project will coexist with primarily greenfield grazing land while upholding the existing rural zone intent. Potential ecological impacts, both direct and indirect, have been managed to date through extensive design workstreams resulting in an increased avoidance of MNES habitats and remnant vegetation. Remaining impacts may include habitat loss, fragmentation, and risks to native wildlife. Mitigation measures will follow a hierarchy: avoidance, minimisation, and mitigation. Throughout the development phase, infrastructure has been designed to reduce significant vegetation impacts at available opportunities. Throughout the construction phase impact mitigation will include general and species-specific measures as well as ongoing monitoring for water quality, dust, and invasive species control as part of the environmental monitoring regime. Additionally, the operational phase will address ongoing risks like bird and bat collisions, erosion and sediment control around infrastructure, and potential disturbances from noise, light, and visual changes.

Pre-clearance assessments, targeted surveys, and active fauna management will further protect flora and fauna during construction. Identified EPBC Act-listed species, including wandering peppercress and austral toadflax, will benefit from design refinements focused on minimising impacts on riparian and sensitive habitats, while key areas containing Austral Cornflower will remain undisturbed. The Project is also committed to offsetting residual impacts through designated offset areas on nearby property,

ensuring compliance with environmental regulations and safeguarding ecological values. These efforts reflect the Proponent's commitment to environmental stewardship while delivering renewable energy to the NEM and job creation, which is aligned with the QEJP.

The Project Site is predominantly composed of non-remnant vegetation (90.56%), with field-verified remnant vegetation (7.61%) and high-value regrowth vegetation (1.84%) in average to good condition, providing important fauna habitat features such as hollows, seasonal nectar resources, and rocky outcrops.

Targeted surveys identified six EPBC Act-listed and migratory fauna species either confirmed or likely to occur within the Project Site, including the koala, greater glider, grey-headed flying-fox, glossy black-cockatoo, white-throated needletail and fork-tailed swift. The expert assessment determined a significant impact is likely on the koala and greater glider following detailed surveys and analysis.

Offsets will be provided to address significant residual impacts after implementing all feasible mitigation measures. The Proponent has acquired property and carried out the necessary field surveys to meet the offset requirements for threatened species and communities.

The Proponent's proactive and transparent approach to consultation has been a cornerstone of the Project, fostering meaningful relationships with stakeholders and the community since its inception close to ten years ago. This commitment has led to the development of robust engagement strategies that ensure clear communication, reduce social risks, and build trust. Key initiatives include the establishment of the Community Consultative Committee and responses to community-raised concerns, such as ongoing background noise monitoring and baseline dust monitoring. These efforts demonstrate the Proponent's responsiveness and dedication to addressing stakeholder feedback. Ongoing regulator engagement with local, state, and federal agencies further reinforces the Proponent's commitment to accountability and adherence to legislative requirements.

The GHG assessment highlights the minimal operational emissions attributable to the Project due to its reliance on wind energy, a renewable resource. Estimated Scope 1 emissions during construction are primarily attributed to land clearing and fuel combustion from construction vehicles. The displacement period for construction-phase emissions ranges from three to seven months, depending on the energy sources displaced. This demonstrates the ability for the Project to quickly offset its carbon footprint and contribute to renewable energy goals.

The QEJP (DES, 2022) highlights the interdependency of delivering new sources of renewable energy and job creation. Only with both supported by all levels of government and projects such as this proposed action, can the QEJP be successfully achieved. Nationally, the Australian Government has set emissions reduction targets of 43% below 2005 levels by 2030 and net zero by 2050. Furthermore, the Australian Government is targeting 82% renewable energy in our electricity grids by 2030. The Tarong West Wind Farm will directly support the achievement of these targets.

Through its thoughtful design, stringent environmental controls, and emphasis on transparent stakeholder engagement, the Project demonstrates its alignment with community expectations and environmental responsibilities. The Proponent's comprehensive assessments, proactive mitigation measures, and commitment to offsetting residual impacts underscore its dedication to contributing to State and Federal carbon emission reduction objectives while simultaneously delivering a sustainable and responsible development. As the Project progresses, these measures will continue to play a vital role in balancing development objectives with ecological and community values.

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