



Environmental Approval: EPBC 2020/8867

Lotus Creek Wind Farm

Matters of National Environmental Significance (MNES)
Management Plan

23 July 2024

**BLUE
POWER
PARTNERS**

Lotus Creek Wind Farm

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Document history and status

Revision	Date	Description	By	Review	Approved
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Rev02	2024-05-27	Additional updates			
Rev03	2024-06-27	Additional updates			
Rev04	2024-07-11	Additional updates			
Rev05	2024-07-22	Additional updates			
Rev06	2024-07-23	Additional updates			

Declaration of accuracy

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

Signed:

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Full name (please print):

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Organisation (please print): **Lotus Creek Wind Farm**

Date: **23/07/2024**

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List of Abbreviations and Terms

Terms	Definitions
BBMP	Bird and Bat Management Plan
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
CoA	Condition of approval
DAWE	Department of Agriculture, Water and the Environment (now DCCEEW)
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment, Science and Innovation (QLD)
Development Footprint	This is the area that will be directly impacted by wind farm development (i.e., the clearing footprint)
DEHP	Department of Environment and Heritage Protection (now Department of Environment and Science)
DoE	Department of the Environment (now DCCEEW)
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning (QLD)
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning (QLD)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
Fauna spotter catcher	A person authorised under the <i>Nature Conservation Act 1992</i> (Qld), holding a valid Rehabilitation Permit, and is suitably qualified to detect, capture, care for, assess, and release wildlife disturbed by clearing with at least 3 years' experience undertaking this work with the protected species.
HBT	Hollow bearing tree
IBRA	Interim Biogeographic Regionalisation for Australia
LCWFPL	Lotus Creek Wind Farm Pty. Ltd.
MNES	Matters of National environmental significance
MSES	Matters of State environmental significance
MW	Megawatts
MWh	Megawatt hours
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
PMST	Protected matters search tool
Project Site (original)	Refers to area defined in Figure 1-1.
RE	Regional ecosystem
REM	Remnant vegetation
SARA	State assessment and referral agency
SDAP	State development assessment provisions
SEVT	Semi-evergreen vine thicket

Terms	Definitions
Project Site	The extent of the properties that the wind farm is located within
SMP	Species Management Program
SPRAT	Species profile and threats database
TEC	Threatened ecological community
the Project	Lotus Creek Wind Farm Project
VM Act	<i>Vegetation Management Act 1999</i> (Qld)
WoNS	Weeds of National significance

1. INTRODUCTION

1.1. Background

The Lotus Creek Wind Farm (the Project) will involve the construction of up to 46 wind turbines that will supply electricity to the national electricity grid. The Project will be constructed approximately 175 km north-west of Rockhampton, between the township of Saint Lawrence on the central Queensland coast and the locality of Lotus Creek to the west, within the Isaac Regional Council local government area (Figure 1-1).

The Project was assessed and approved under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (2020/8867) on 31 October 2022.

1.2. Purpose

This document, the Lotus Creek Wind Farm Matters of National Environmental Significance (MNES) Management Plan (hereafter referred to as the 'Plan'), has been developed to address EPBC Act conditions of approval (CoA) 10 to 17, Attachment D and Attachment E.

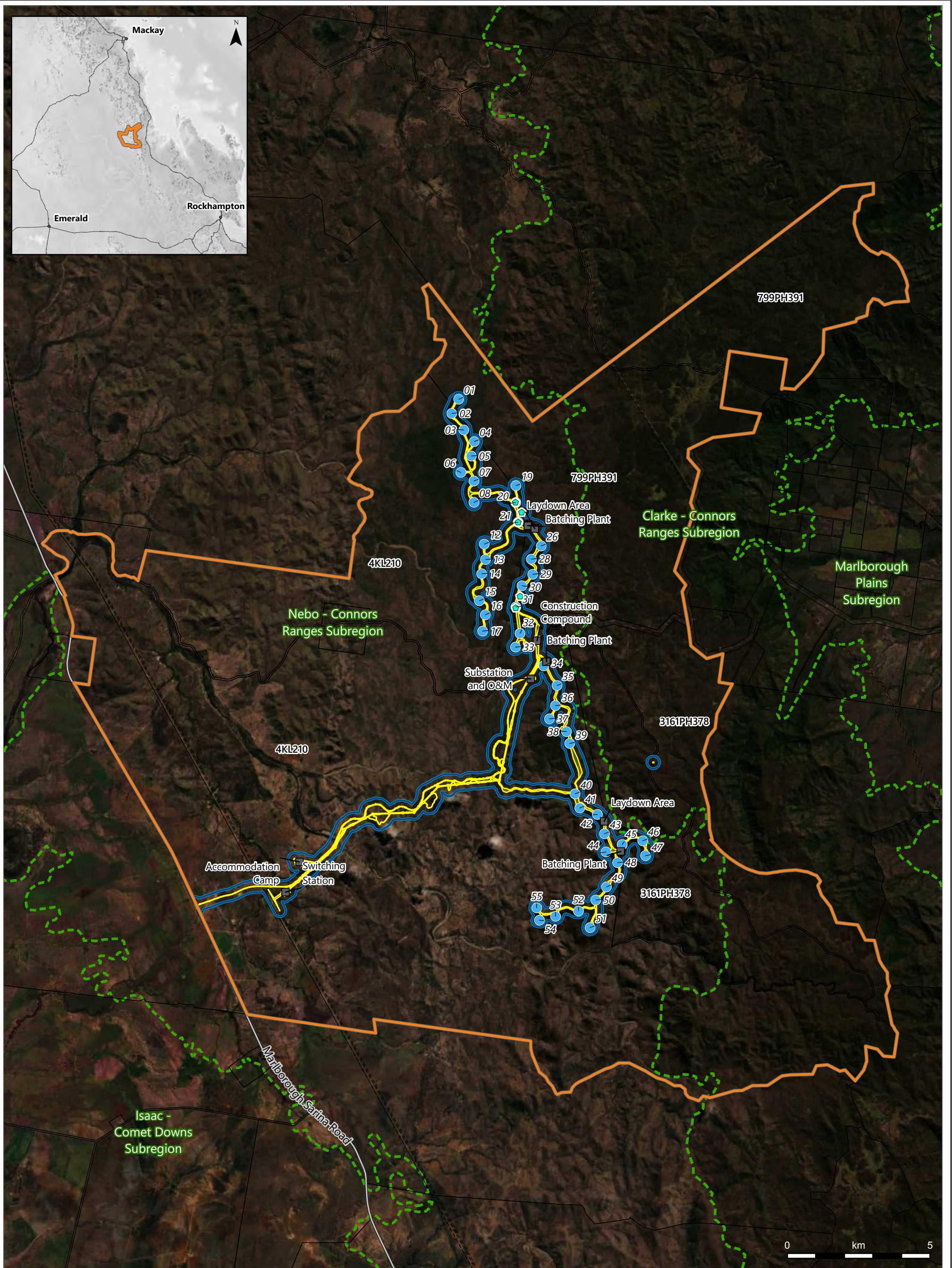
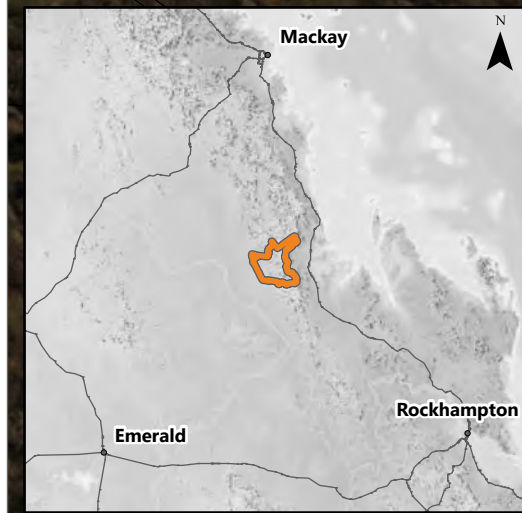
This Plan has been developed to demonstrate how relevant CoA have been addressed and demonstrate how potential impacts to MNES will be avoided, minimised and mitigated through construction, operation and decommissioning of the Project.

The 'EPBC Act listed species' and 'EPBC Act listed migratory species' (hereafter referred to as MNES species) relevant to this Plan are those that were identified as known or likely to occur in the Preliminary Documentation (see additional information in Section 3.2). MNES species relevant to this Plan are:

- Koala (*Phascolarctos cinereus*);
- Southern Greater Glider (*Petauroides volans*);
- Squatter Pigeon (Southern) (*Geophaps scripta scripta*);
- White-throated Needletail (*Hirundapus caudacutus*);
- Black-faced Monarch (*Monarcha melanopsis*);
- Rufous Fantail (*Rhipidura rufifrons*); and
- Satin Flycatcher (*Myiagra cyanoleuca*).

MNES species profiles are provided in Appendix B.

The Project is committed to developing and implementing appropriate avoidance, mitigation and management measures during the construction, operation and decommissioning phases of the project. This plan identifies these measures, the performance outcomes, monitoring schedules and reporting that will ensure the actions are effective in achieving the performance criteria.



- Site Boundary
- Project Area
- Development Footprint
- Wind Turbine Generator
- Met-mast
- Facilities
- Major Road
- Biogeographic subregion
- Cadastre

WIND FARM LAYOUT



REVIEWED: [Redacted]

DRAWN: [Redacted]

SCALE (A3): 1:125,000

DATE: 19/06/2024

DWG No: VES-006_017

FIGURE 1-1

1.3. Suitably qualified ecologist

Condition 15 c of the CoA requires that the Plan must be prepared by a suitably qualified ecologist, defined as:

“a person who has relevant professional qualifications and at least three years experience designing and implementing management plans for the protected matters and can give authoritative independent assessment, advice and analysis on the management requirements of the protected matters and their habitat using the relevant protocols, standards, methods and/or literature.”

This plan was prepared by [REDACTED] who holds formal qualifications in the field of environmental management and ecology and has almost 30 years’ experience in preparing management plans and providing ecological advice (see detailed CV in Appendix A).

1.4. Related management plans

A range of environmental management plans are required to be developed for the Project in accordance with State approvals (2312-38389 SPD) and the EPBC approval 2020/8867. Relevant sections of these plans have been included in this Plan. Various management plans required to address approvals include the following:

- Bushfire Management Plan
- Construction Environmental Management Plan
- Vegetation and Fauna Management Plan
- Erosion and Sediment Control Plan (ESCP)
- Rehabilitation Management Plan (RMP)
- High and Low Risk Species Management Programs (breeding place disturbance permits)
- Offset Area Management Plan (OAMP)
- Cycad Translocation Plan (*Nature Conservation Act 1992* listed species)
- Bird and Bat Management Plan (BBMP).

2. EPBC ACT CONDITIONS OF APPROVAL

This Plan has been prepared to address CoA 10 to 17, and associated Attachment D and Attachment E. Table 2-3, Table 2-2 and Table 2-3 presents each relevant condition respectively, along with the section of the Plan where these are addressed.

Table 2-1 Conditions of approval reference table (EPBC 2020/8867)

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
10	To avoid, mitigate and manage impacts of the action on EPBC Act listed threatened species and EPBC Act listed migratory species and their habitat, the approval holder must submit to the department for the approval of the Minister, a Matters of National Environmental Significance (MNES) Management Plan to the satisfaction of the Minister.	This Plan sets out measures to avoid, mitigate and manage potential impacts to MNES.	This document
11	The approval holder must not commence the action until the MNES Management Plan has been approved by the Minister.	Commencement will not occur until the Plan has been approved	
12	The approved MNES Management Plan must be implemented upon commencement of the action and for the duration of the approval.	The Plan will be implemented from the date of its approval and will be implemented for the duration of the approval.	
13	The MNES Management Plan must take all reasonable steps to ensure that impacts to EPBC Act listed threatened species and EPBC Act listed migratory species, are avoided and mitigated.	This Plan outlines commitments for avoidance and mitigation of potential impacts to MNES	Section 7 Table 7-1
14	Ensure that the action does not impact on MNES located outside of the Development Footprint, including areas outside the project site, resulting from sediment run-off from the Development Footprint.	This Plan outlines commitments for erosion and sediment control in accordance with International Erosion Control Association (IECA), Best Practice Erosion and Sediment Control Guideline (IECA 2008).	Section 7 Table 7-1

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
15	The MNES Management Plan must: a. include details of specific environmental outcomes to be achieved to avoid, mitigate and manage impacts on EPBC Act listed threatened species and EPBC Act listed migratory species and their habitat during construction, operation and decommissioning of the action; b. include commitments to achieve the objectives; c. be prepared by a suitably qualified ecologist; d. be in accordance with the department's Environmental Management Plan Guidelines; e. specify reporting and review mechanisms, and documentation standards to demonstrate compliance with the MNES Management Plan; and f. include the requirements specified in <u>Attachment D</u>.	a. Relevant environmental outcomes have been developed for each MNES to ensure potential impacts during construction, operation and decommissioning are minimised. b. Commitments to achieve objectives are outlined in this Plan. c. This Plan has been prepared by a suitably qualified ecologist. d. This has been prepared in accordance with the Environmental Management Plan Guidelines (DOE, 2014). e. Annual reporting will be prepared to align with CoA 58 requirements. Separately, the suitability of this Plan will be reviewed and updated following any non-compliance events in accordance with requirements of CoA 59. f. See Table 2-2	a. Section 6, Table 6-1 b. Section 7, Table 7-1 c. Section 1.3, Appendix A d. This Plan e. Section 9.2 f. See Table 2-2
16	The MNES Management Plan must state and justify a speed limit to vehicles operating within the project site during project construction, operation and decommissioning to minimise impacts to MNES.	Speed limits and associated signage and appropriate driving procedure will be implemented as part of this Plan.	Section 7.12

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
17	In accordance with the SARA Decision notice – Lotus Creek Wind Farm, six months prior to commencement of decommissioning of the action, the approval holder must provide to the department for approval by the Minister, a decommissioning and rehabilitation MNES Management Plan to the satisfaction of the Minister, outlining measures to manage MNES during the decommissioning stage of the action and rehabilitation.	This Plan will be adapted to create a decommissioning and rehabilitation MNES Management Plan, which will be provided to the department for approval by the Minister, at least 6 months prior to decommissioning actions.	Section 10.5

Table 2-2 Conditions of approval reference table (EPBC 2020/8867) - Attachment D: MNES Management Plan Requirements

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
The MNES Management Plan must:			
a	Include measures to ensure that MNES are not injured in the clearance of the development footprint.	This Plan outlines commitments for avoidance and mitigation of MNES injury as a result clearing activity.	Section 7.3 Section 9.1
b	Include a commitment ensuring a fauna spotter catcher will be present during all habitat clearance activities, with the authority to cease habitat clearance for an appropriate timeframe where one or more EPBC Act listed threatened species and/or EPBC Act listed migratory species could be impacted and must include: i. canopy searches for Koalas; ii. canopy and suitably sized tree hollow inspections for Greater Gliders; and iii. flushing for Squatter Pigeons in potential Squatter Pigeon habitat.	A suitably qualified fauna spotter catcher (FSC) will be present prior to and during vegetation clearing. The FSC will undertake pre-clearance surveys prior to any habitat clearing commencing and will include canopy searches for Koala, canopy searches and identification of suitably sized tree hollows for Greater Gliders, and flushing for Squatter Pigeons in potential Squatter Pigeon habitat.	Section 7.3 Section 9.1

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
c	Ensure Greater Gliders can move between habitat fragmented within the development footprint, by: i. including a commitment to install glider poles in Greater Glider habitat where clearing widths for roads is such that distance between trunks of >30cm DBH trees is 1.2 times the canopy height, or less, to allow Greater Gliders to move between trees.; ii. ensuring sections of road in Greater Glider habitat have a cleared width of no more than 15 m for a minimum length of 50 m. One section of 15 m wide road is required per 500 m of Greater Glider Habitat fragmented by the development footprint; and iii. including a commitment to mitigate Greater Glider habitat loss by ensuring all potential Greater Glider hollows to be cleared as a result of the action are relocated to Greater Glider habitat in areas of retained vegetation or revegetated habitat within the project site, or the Greater Glider offset site to provide additional habitat. The approval holder must undertake the salvage and relocation of Greater Glider hollows according to the conditions detailed in Attachment E.	i. Designs for the Project have been updated to avoid all Greater Glider habitat, with the exception of two locations. At both locations the distance between >30cm DBH trees is already more than 1.2 times the canopy height, and as such, already present a barrier to Greater Glider movement. ii. Road widths in Greater Glider habitat will not exceed 15 m for a length of 50m and one section of 15m wide road is required per 500 m of Greater Glider habitat. iii. All potential Greater Glider hollows will be salvaged and relocated in accordance with requirements set out in Table 2-3.	Section 7.5, Section 7.6, Section 9.1

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
d	Include a monitoring program to assess the utilisation of glider poles and salvaged hollows across the development footprint. The monitoring program must: i. identify criteria for assessing Greater Glider use of glider poles and salvaged Greater Glider hollows; ii. ensure that glider poles are installed correctly according to best practice information and can be used by Greater Gliders to cross fragmented Greater Glider habitat in the development footprint; detail the timing and frequency of monitoring; and iii. detail site and other relevant characteristics for each glider pole in the development footprint and whether there was evidence of use by Greater Gliders to cross road clearings.	Where glider poles or hollows are installed in accordance with best practice guidelines (as per TMR 2011 Fauna Sensitive Road Design Manual Volume 2), and use of crossing structures and hollows they will be monitored for the duration of the approval.	Section 9.1.1
e	Specify management measures for controlling bushfires in the project site and preventing bushfires resulting from the action from entering into the Clarke-Connors Ranges and impacting on MNES outside of the project site.	Measures will be implemented to minimise the risk of bushfires resulting from actions relating to the Project. In addition, the Project will work with landholders and the Queensland Rural Fire Service to ensure risks of bushfire from the Project are minimised.	Section 7.10
f	Include a commitment to rehabilitate all temporary clearance areas, including, but not limited to road shoulders, within 6 months of completion of construction with local native flora species to minimise erosion and sediment run-off.	Temporary clearance areas will be rehabilitated within 6 months using native species to achieve 70% cover relative to undisturbed sites adjacent temporary disturbance areas.	Section 7.11
g	Detail potential changes in project site utilisation by the EPBC Act listed bird and bat species during construction.	Potential changes in project site utilisation by EPBC Act listed birds and bats during construction will include displacement and alienation as a result of construction disturbance.	Section 4.2
h	Detail measures, and timeframes for implementation, that will be taken in the project site during the construction phase to avoid, mitigate and manage impacts of the project on EPBC Act listed bird and bat species.	Measures and timeframes are presented in Table 7-1.	Table 7-1

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
i	Specify management measures for controlling sediment run-off and erosion associated with the action to avoid impacting on MNES including, but not limited to Koala habitat, Squatter Pigeon habitat, Greater Glider habitat.	Erosion and sediment control management plans will be developed in accordance with principles set out in International Erosion Control Association (IECA) 2008 standards. As per the SARA Decision Notice an Erosion and Sediment Control Plan (ESCP) will be prepared by a suitably qualified professional and submitted to the Queensland Department of Resources prior to commencing works. An overview of measures has been included in this Plan.	Section 7.13
j	Include native flora species in the Erosion and Sediment Control Plan to be implemented under condition 30 in the SARA Decision notice – Lotus Creek Wind Farm.	Erosion and sediment control plans will incorporate the use of native flora species to meet erosion and sediment control outcomes in line with IECA Best Practice Guideline documents.	Section 7.13
k	Specify weed and pest management measures associated with the action.	Weed and pest management procedures have been developed and will be implemented for the duration of the action.	Section 7.9
l	Include a commitment to ensure that weeds and pest animals (e.g. rabbits) are not spread as a result of the action, into the bordering Clarke- Connors Ranges located outside of the project site, and impact on MNES within the Clarke- Connors Ranges.	Weed and pest management procedures include measures to minimise risks associated with potential introduction and spread of weeds and pests.	Section 7.9
m	Include a commitment to ensure that feral predator populations (including, but not limited to foxes, cats, pigs and dogs) do not increase in the region as a result of increased carcass numbers from turbine strike associated with the action and impact on MNES located inside and outside of the project site.	Feral pest management programs will be implemented for the duration of the approval to ensure that feral predators that may impact MNES species do not increase as a result of the Project.	Section 7.9.2

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
n	Provide links to other plans or conditions of approval (including conditions in the SARA Decision notice – Lotus Creek Wind Farm).	Conditions associated with the State approval can be found at https://planning.dsdmip.qld.gov.au/sara-decisions ¹ Plans prepared to address SARA Development Approval conditions will be provided to relevant State government agencies and kept on file, and are available on request. Any relevant commitments from the State approval and associated measures in management plans have been incorporated into this Plan where relevant.	
o	Detail specific timing, frequency and duration of the measures to be implemented.	Proposed measures have been developed and include commitments relating to timing, frequency and duration.	Section 7
p	Include evidence of how the measures are based on best available practices, appropriate standards, and supported by scientific evidence.	This Plan has been prepared by a suitably qualified ecologist with relevant best practice guidelines and standards referenced throughout. In addition, relevant conservation advice for each MNES species has been considered in the preparation of measures.	Section 1.3 and 7 and Table 7-2
q	Include details on how the measures have been developed with consideration of the S.M.A.R.T principle.	Measures have been developed to be S.M.A.R.T.	Section 5.2
r	Include a risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the MNES Management Plan and timely achievement of the environmental outcomes, including a rating of all initial and post-mitigation residual risks in accordance with the risk assessment matrix (Attachment C).	A risk analysis of management and mitigation strategies has been undertaken, including risk ratings before and after controls.	Section 8
s	Provide evidence of how the measures and corrective actions take into account relevant approved conservation advice and are consistent with relevant recovery plans and threat abatement plans.	Advice from relevant conservation advice and recovery plans has been incorporated in the development of measures.	Table 7-2

¹ The search term 'Lotus Creek Wind Farm' used within the link provided will identify the current and historic approval relevant to the Decision Notice including approved changes and relevant plans submitted

Table 2-3 Conditions of approval reference table (EPBC 2020/8867) - Attachment E: Protocol for salvaging Greater Glider hollows

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
a	Ensure all Greater Glider hollows to be cleared as a result of the action are inspected for Greater Gliders.	Areas of mapped Greater Glider habitat will be inspected for trees with a DBH >30cm. Where present, spotlighting will be undertaken to assess for presence and use of hollows by Greater Gliders.	Section 7.3.2
b	Ensure the use of techniques to encourage Greater Gliders to leave their hollows prior to removal of any tree, including tapping trees and using spotlights. If Greater Gliders are potentially present, trees must be dismantled in sections.	Clearing techniques sensitive to any species potentially utilising hollows will be undertaken throughout the development footprint.	Section 7.4
c	Ensure that the height and orientation of the Greater Glider hollow and the species of tree it is derived from must be recorded prior to the salvaging of the hollows.	Records of the height and aspect, and tree species (where alive) of any trees where hollows have been identified as used by Greater Gliders will be undertaken prior to salvage.	Section 7.3.2
d	Install Greater Glider hollows in the relocation site at a similar orientation, height and tree species as recorded in the above condition.	The location, assessment of habitat suitability, and commitment for installation at the same height and orientation will be identified and overseen by a suitably qualified ecologist.	Section 7.5
e	Determine the depth and height of the Greater Glider hollows prior to salvage operation and retained in the salvage operation.	Any hollows to be salvaged will have a number of observations and measurements recorded including depth and height.	Section 7.3.2
f	Ensure after harvesting, the Greater Glider hollows are sealed to weather-proof the hollow.	Salvaged and relocated hollows will be sufficiently sealed and insulated to ensure the remain suitable for use by Greater Gliders	Section 7.5
g	Ensure the excised hollows are deep enough to enable the addition of insulation material.		
h	Commit to using the sawdust from the harvesting of the tree hollow as insulation in the base of the harvested Greater Glider hollows. Insulation material at the base of the hollow must be at least as deep as the thickness of the sides of the hollow. Additional insulation may be required.		
i	Ensure Greater Glider hollow removal	Salvage and installation works will be	Section 7.3.2

No.	Condition	Demonstration of how the Plan addresses CoA	Section of the Plan
	and installation is undertaken by trained arborists.	undertaken by a trained arborist.	
j	Commit to ensuring host trees, which Greater Glider hollow will be installed, are protected from ring-barking.	Any trees with salvaged or artificial hollows installed by the Project will have tree guards to ensure that they are not accidentally impacted in the future	Section 7.5
k	Monitor Greater Glider hollows to detect evidence of Greater Glider use and monitoring results are to be included in the annual compliance report under condition 58.	Salvaged and relocated hollows will be monitored with results presented in compliance reports.	Section 9.1.1

3. EXISTING ENVIRONMENT

Ecological field survey for preparation of the Preliminary Documentation were undertaken from April 2019 to December 2022 across multiple seasons. Detailed ecological field surveys were undertaken in April and May 2019, October and November 2019, September 2020, August 2021 and November/December 2022. These surveys were undertaken to document existing vegetation communities, search for threatened flora and fauna species and to document habitat values. Targeted surveys were conducted for listed threatened flora and fauna species. Surveys were undertaken in accordance with relevant guidelines and informed the project approval documentation, including:

- Preliminary Documentation for EPBC Act assessment; and
- Ecological assessment report for assessment under Wind Farm State Code 23.

Surveys were also undertaken in August 2021 to map habitat for MNES, habitat features such as HBTs and threatened plants. Bird utilisation surveys were repeated in 2019, 2021 and 2022.

3.1. Landscape attributes

The Project Site is characterised by agricultural activities (primarily beef cattle production), with a mix of vegetated and cleared to support these uses. Surrounding properties contain a mixture of vegetated and cleared land for raising cattle. A State Forest supporting intact native vegetation occurs to the northeast of the Project Site. No cropping or activities such as mining occur in the Project Site or its immediate surrounds.

The Project Site lies within the Brigalow Belt bioregion, which falls within the Fitzroy Catchment and the Isaac Connors sub-catchment in the Isaac Regional Council Local Government Area, Central Queensland. The Project Site is predominantly within the Nebo-Connors Range IBRA sub-region, with the Clarke- Connors Range adjacent to the eastern portion of the Project Site.

The Project Site is located on the eastern edge of the Fitzroy catchment. The Fitzroy catchment is the largest river catchment flowing to the eastern coast of Australia and the second largest catchment in Australia. The Fitzroy River flow is highly episodic, with seasonal bias to high flows in summer. The catchment has recognised land degradation problems, including all forms of soil erosion by water, and soil fertility decline. The Fitzroy catchment is a managed water plan area, where water use is subject to the Fitzroy Basin Water Plan controls (FBA 2011).

The Isaac Region runs from Clairview and St Lawrence on the coast, westward past the settlement of Clermont and extends just beyond the Carmichael River. The shire is sparsely populated and supports an agricultural industry of beef production and cropping. Coal mining and resource operations are also major industries in the region (Isaac Regional Council 2023).

The majority of the Project Site falls within the Connors Volcanic Group, made up of felsic to mafic volcanic rocks; rhyolitic to andesitic flows, high-level intrusive, and volcanoclastic rocks including ignimbrite (GSA 2023).

The area within the Project Site comprises of three dominant soil types (Queensland Globe 2023):

1. In the eastern portion of the site, in sections that are elevated, strongly undulating or occasionally low hilly lands often bounded by steep dissected scarps, the soil type is duplex yellow-grey, hard setting A horizon, A2 horizon conspic bleached acid pedal mottled B horizon.
2. In the centre of the site, in sections that are hilly with steep slopes the soil type is duplex yellow-grey, hard setting A horizon, A2 horizon conspic bleached, neut pedal mottled B horizon.
3. In the western portion of the site, in sections that are high hilly lands but with rounded hill crests and only moderately steep slopes the soil type is firm shallow siliceous loams.

3.1.1. Flora and vegetation communities

A total of 22 regional ecosystems (REs) were identified in the Project Site. Eight main vegetation communities were found to be present within the Development Footprint. These vegetation communities are described as:

- Vegetation Community 1: *Eucalyptus crebra* Woodland to Open Woodland
- Vegetation Community 2: Riparian Vegetation
- Vegetation Community 3: Mixed Eucalypt Woodland communities
- Vegetation Community 4: Semi-Evergreen Vine Thicket (SEVT) (RE 11.12.4)
- Vegetation Community 5: *Acacia* shrubland
- Vegetation community 6: *Xanthorrhoea* shrubland
- Vegetation community 7: *Lophostemon* woodland
- Vegetation community 8: *Leptospermum* shrubland.

The majority of the Development Footprint contains *Eucalyptus crebra* woodland with patches of other communities scattered throughout the footprint. The majority of the mixed eucalypt woodland lies on the eastern side of the Development Footprint.

Although, SEVT (RE 11.12.4) is present within the Project Site it is not analogous with the Threatened Ecological Community (TEC) *Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions*.

Habitat condition within the Project Site was variable due to different soil types, disturbance histories, and land management. Habitat condition impacts the availability of micro-habitat resources, such as HBTs, and habitat extent and connectivity to other areas.

Generally, habitat quality was higher in the eastern portion of the Project Site, and more degraded in the western portion. Areas where habitat types intersect, providing ecotones, on western slopes, gullies, and in riparian vegetation communities, provided the highest quality habitat.

3.1.2. Fauna habitat assessment

The eastern range (Clarke-Connors Range) is in excellent condition, with large hollows and remnant native vegetation, providing high-quality breeding and foraging resources. This is outside of the Development Footprint.

Habitat features of the site for native fauna consist of resources (e.g., foraging and breeding niches) of varying quality and condition. Regarding native fauna, the site provides the following habitat resources:

- Foraging resources in the form of *Acacia*, *Corymbia* and *Eucalyptus* species
- Ephemeral watercourses with some permanent waterways providing habitat for aquatic fauna and resources for all other fauna
- Terrestrial habitat including coarse woody debris, surface rocks and some small rocky jumbles
- Dry grass and leaf litter across the site.

The Project Site is broadly characterised by undulating landforms. Due to the large wind current occurring at the top of the ridge, these ridges are the preferred locations for most of the wind turbines. The majority of the ridgelines in the eastern portion of the site still contain remnant vegetation with high fauna habitat values. The quality of the habitat on Clarke-Connors Range, outside the Development Footprint, is highlighted by the large number of Greater Glider and Koala records in this area. Greater Gliders require large hollows and the number of Greater Glider found spotlighting attests to the extremely hollow rich environment. This is also confirmed by the sighting of the Powerful Owl which requires large, old hollows to breed, and forages on Greater Glider. The large number of Koalas shows evidence of quality foraging resources and connectivity across the site.

Suitable habitat for each EPBC listed threatened species known to occur in the Project Site is discussed in Section 3.2. Habitat for Koala, Greater Glider and Squatter Pigeon are shown in Figure 3-1, Figure 3-2 and Figure 3-3.

The Project Site is broadly characterised by undulating landforms which are terminated at the periphery by dissected, rocky ridge lines. Due to the large wind currents occurring at the top of the ridge, these ridges are the preferred locations for most of the wind turbines. These watercourses have important ecological values.

The ridge country (e.g., areas of the site containing steep slopes and ridge tops), particularly within the southern and western aspect, features niche habitats in highly restricted situations for a unique range of species (e.g., vine thicket). Where trees have established along ridges, these are typically stunted, wind-sheared forms with coarse, often tessellated bark. Nearly all the ridges have patches of vine thickets occurring along the southern aspect.

The terrain within the Project Site creates several habitat types for flora and fauna. These habitats include:

- The southern section is dominated by remnant *Eucalyptus* and *Corymbia* species. This area has a very high number and range of hollows and supports a high biodiversity and number of threatened species including Greater Glider and Koala. This area also had the highest microbat trapping success within the more closed forest areas. Grazing pressure and low rainfall have reduced the ground vegetation cover, but this is expected to improve after rainfall.
- Watercourses and ephemeral wetlands are found across the Site. During the Autumn surveys, ephemeral wetlands were flooded with frogs breeding in large numbers. There are a number of ephemeral watercourses and some permanent watercourses. The permanent watercourses have *Melaleuca* and large *Eucalyptus* species along the banks that provide high quality habitat for Koalas, Greater Gliders and other hollow dependant fauna. The water resources provide habitat for frog species and other aquatic fauna. Squatter Pigeons were predominantly recorded within 100 m of a water feature.
- Some areas in the north of Lot Plan 799 PH391 and through Lot Plan 4 KL210 have been previously clear felled or show signs of dieback. These areas support a lower density of fauna with fewer canopy trees; however, they still provide grazing resources for macropods and scattered food trees for Koala. The dead ring barked trees have also formed hollows which provide habitat for microbats and other hollow dependant fauna for semi-aquatic plants.

3.1.3. Hollow bearing trees and other habitat features

A total of 1,483 HBTs have been recorded within the Development Footprint. Many of these trees were stags with multiple hollows. Three bird nests were recorded, noting that more are likely to be observed during pre-clearance surveys (Section 7.2).

Rock piles, boulder patches and rock covered slopes were common within the footprint and provide habitat for many species of reptiles and small mammals. Habitat features which have been identified onsite are summarised in Table 3-1.

Table 3-1 Habitat features recorded within the Development Footprint

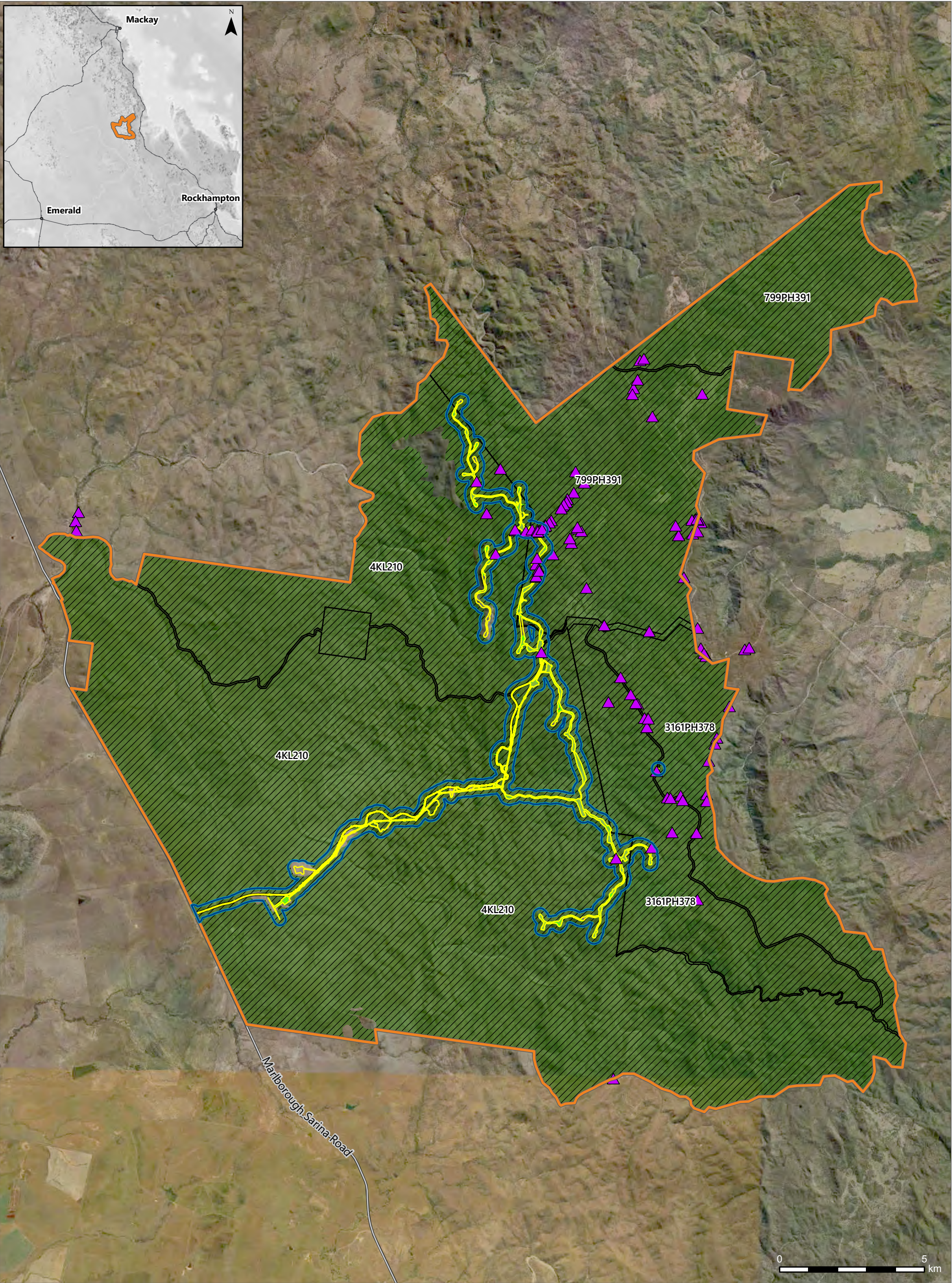
Type	Number of individuals	Potential for use by general fauna and MNES
Hollow bearing tree	1,483	Gliding mammals; birds; possums; reptiles; microbats
Nests	3	Birds
Rock crevices and small caves	36	Reptiles, mammals

Other habitat features (including dense vegetation, boulder fields, termite mounds, riparian vegetation, log piles, hollow logs)	786	Reptiles; mammals; amphibians
Water bodies including dams	9	Reptiles, including turtles; fish; amphibians
Burrow	21	Echidna; pests, including rabbit, fox

The locations of the HBTs and other habitat features will be provided as spatial data to the principal and construction contractors, who will seek to avoid these values in detailed design. This data will also be provided to the ecologists and/or FSCs undertaking the pre-clearance surveys so that they can assess equipment requirements and check if the hollows are being used prior to clearing.

3.1.4. Weeds and pests

A number of weed species were recorded on site, including Weeds of National Significance (WoNS), and Queensland *Biosecurity Act 2014* weed species. Six pest animal species were confirmed in the Project Site. Refer to Table 7-3 for further information regarding the weed and pest species within the Project Site.

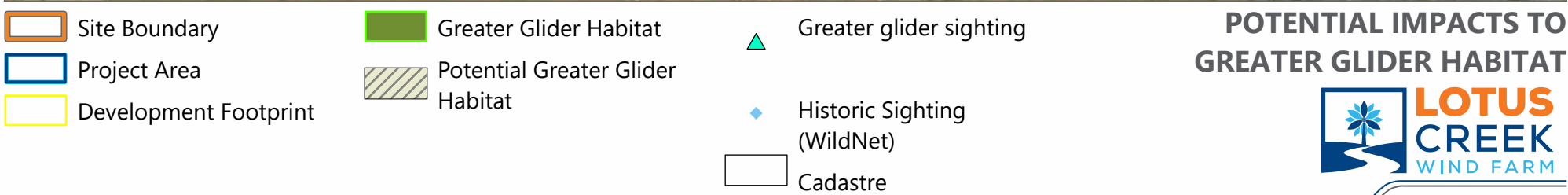
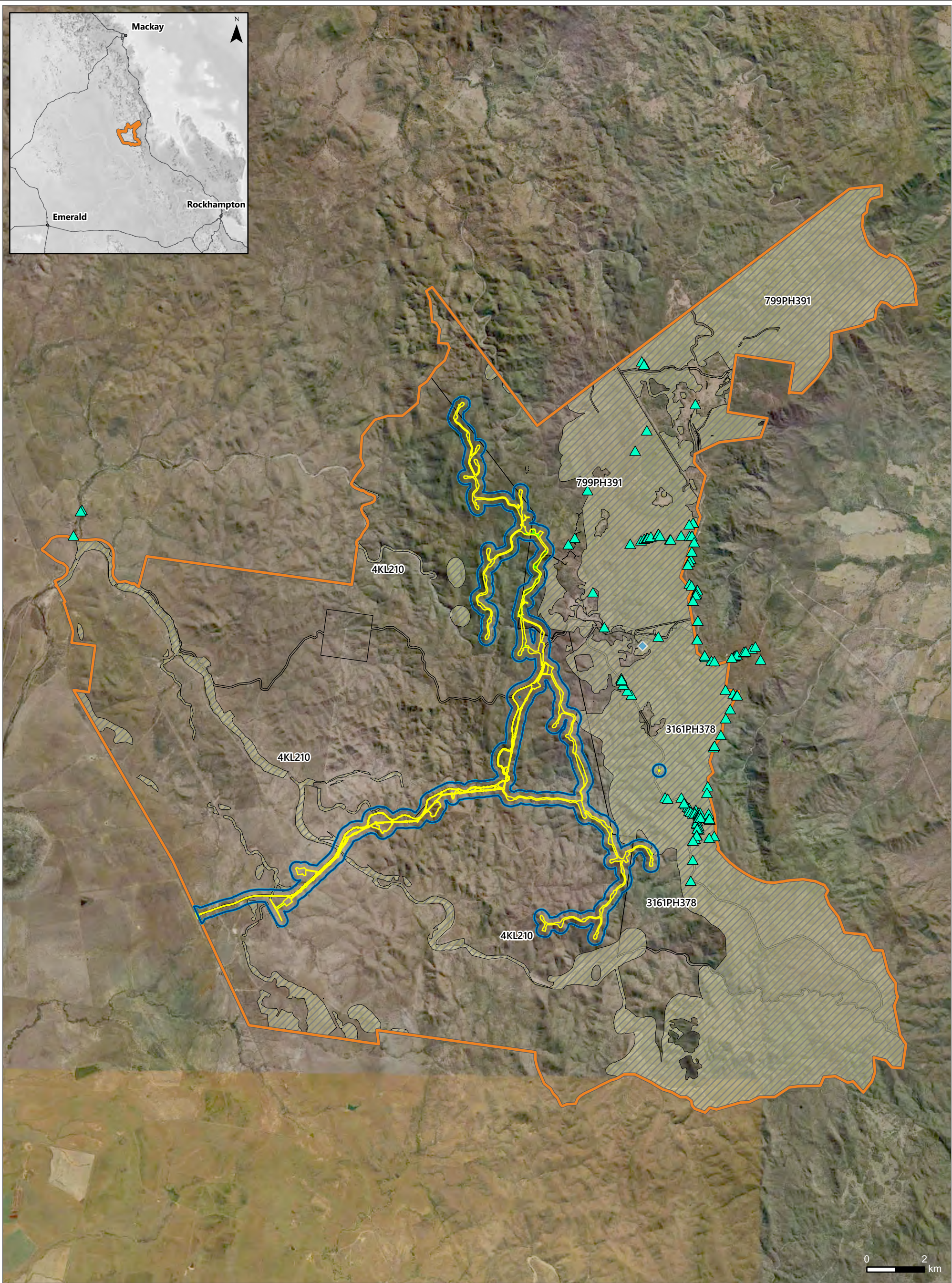


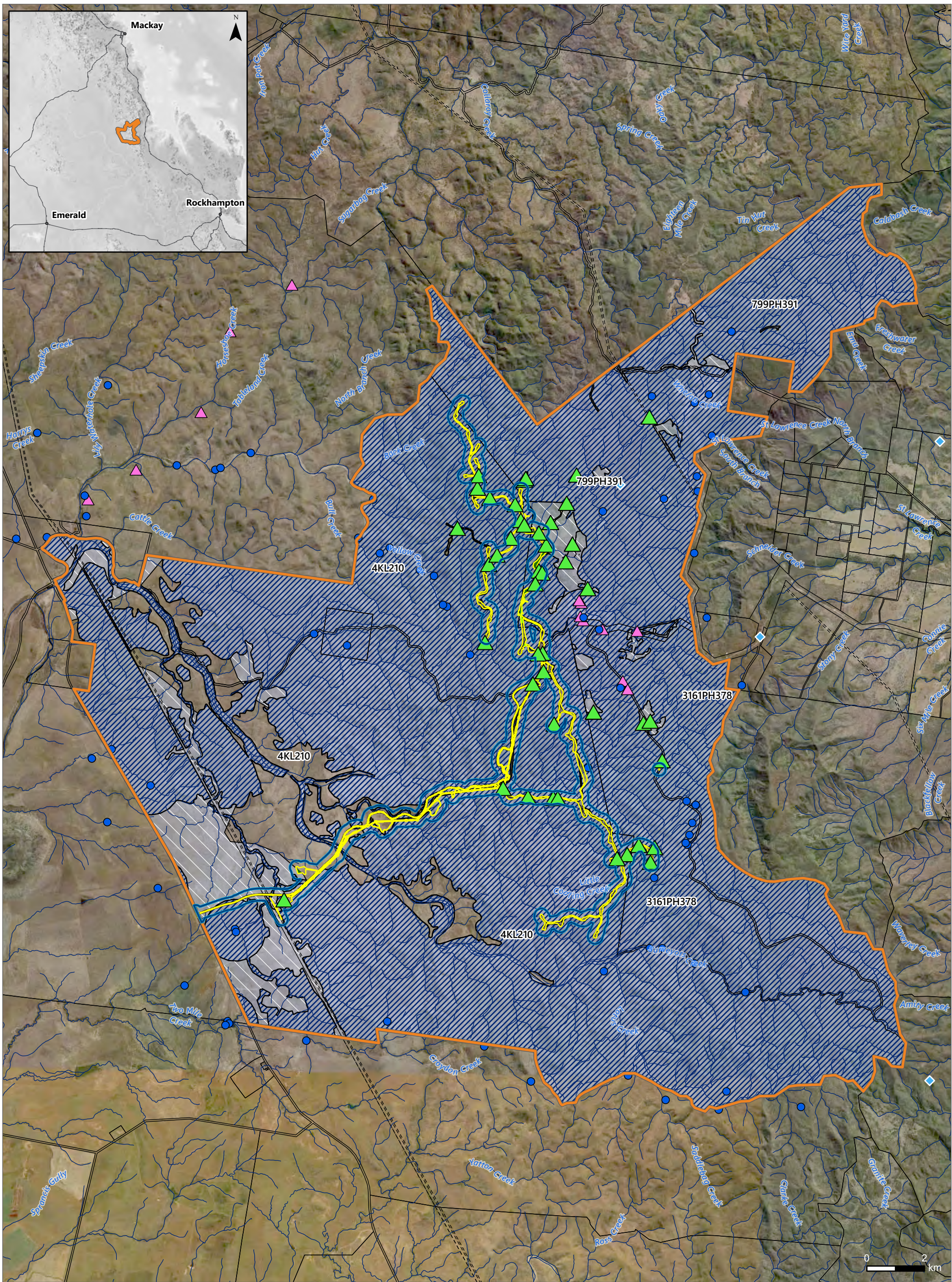
- | | | |
|-----------------------|-------------------------|----------|
| Site Boundary | Koala sighting | Cadastre |
| Project Area | Koala Habitat | |
| Development Footprint | Potential Koala Habitat | |

POTENTIAL IMPACTS TO KOALA HABITAT



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Site Boundary

Project Area

Development Footprint

Watercourse

Habitat Point

Historic Record

Squatter pigeon Sighting

Permanent Water Point

Squatter pigeon breeding habitat

Squatter pigeon foraging habitat

Cadastre

Potential Squatter pigeon breeding habitat

Potential Squatter pigeon foraging habitat

POTENTIAL IMPACTS TO SQUATTER PIGEON HABITAT

LOTUS CREEK WIND FARM

3.2. Matters of National Environmental Significance

The following MNES were recorded (or were considered likely to occur) during the field surveys. These species and their listings under the EPBC Act are identified in Table 3-2. These are the species subject to this Plan.

A detailed profile has been provided for threatened species in Appendix B. Habitat mapping is provided to show the area of Koala (Figure 3-1), Greater Glider (Figure 3-2) and Squatter Pigeon habitat (Figure 3-3).

White-throated Needletail and Fork-tailed Swift do not breed in Australia and rarely land, so these species are not likely to be impacted by clearing or construction activities. Potential impacts to these species and mitigation measures are described separately in the Bird and Bat Management Plan (BBMP).

Table 3-2 MNES known or likely to occur within the Project Site

Matter	Likelihood in Project Site	EPBC Act Status*
Fauna		
Koala (<i>Phascolarctos cinereus</i>)	Confirmed	V
Greater Glider (<i>Petauroides volans</i>)	Confirmed	V
Squatter Pigeon (southern) (<i>Geophaps scripta scripta</i>)	Confirmed	V
Migratory birds		
White-throated Needletail (<i>Hirundapus caudacutus</i>) ^	Confirmed	Mi, V
Fork-tailed Swift (<i>Apus pacificus</i>) ^	Confirmed	Mi
Black-faced Monarch (<i>Monarcha melanopsis</i>)	Moderate	Mi
Rufous Fantail (<i>Rhipidura rufifrons</i>)	Moderate	Mi
Satin Flycatcher (<i>Myiagra cyanoleuca</i>)	Confirmed	Mi

* Status codes relevant to this Plan: E – Endangered, V – Vulnerable, Mi – Migratory.

^ Species addressed in the BBMP

4. IMPACTS

4.1. Key aspects and impacts

Key aspects of the Project that are likely to result in impacts to MNES include:

- Site establishment, including installation of temporary facilities and mobilisation of equipment and materials
- Vegetation clearing
- Earthworks and excavation, including trenching works for installation of underground cabling
- Construction of overhead power lines
- Construction of hardstands and access track construction, including vegetation clearing, topsoil stripping, earthworks, and drainage works
- Installation of wind turbines
- Commissioning and operation of wind turbines and site compound facilities
- Vehicle movement during construction, operation and decommissioning.

4.2. Potential environmental impact and risks to MNES

This section of the Plan describes the potential impacts that may occur to the MNES as a result of Project activities as described in the *Lotus Creek Wind Farm Preliminary Documentation 2020/8867* (NGH, 2021) (PD). The PD identified a number of potential impacts that have the potential to occur throughout the life of the Project.

4.2.1. Flora

Impacts to flora are expected to include:

- The removal of remnant vegetation and potential habitat; and
- Increased competition from weed species which may be introduced to the Site Boundary or spread to new locations as a result of the Project.

4.2.2. Fauna

Impacts to fauna are expected to include:

- Removal of up to 341.36 ha of suitable Koala habitat;
- Removal of up to 48.75 ha of suitable habitat for Greater Glider;
- Removal of up to 16.39 ha of Squatter Pigeon breeding habitat, and 32.25 ha of foraging habitat;
- Injury and mortality of MNES species by direct interaction (i.e. injuries during clearing, vehicle strike, or collision with turbines or barotrauma);
- Loss or fragmentation of MNES habitat and reduced connectivity;
- Loss or damage of habitat features such as hollows, fallen timber, dead wood and bush rocks;
- Introduction and spread of invasive fauna and flora species;
- Habitat degradation by increased weeds, dust, run-off and sedimentation;
- Barrier effects that limit bird and bat movements between essential resources;
- Disturbance of surface waterways and waterbodies or groundwater systems; and
- Disturbance to wildlife through increased light, noise and vibration.

These potential impacts to site utilisation by MNES species are not universal, with some species more susceptible to the potential impacts than others. In recognition of this, the potential impacts to MNES species as identified by the relevant conservation advice, recovery plans and threat abatement plans is outlined within Table 4-1. This includes assessment of potential temporary changes to site utilisation by MNES bird and bat species during construction.

Table 4-1 Summary of Potential Impacts to MNES

Potential Impact	Potential Impacts to MNES	Impacted MNES	Project Phase
Injury and mortality of MNES species by direct interaction (injuries during clearing, vehicle strike, or collision with turbines or barotrauma)	Death of Injury to MNES species	All	All phases
Temporary displacement and alienation of fauna	Construction activities may cause displacement and alienation of fauna as a result through noise, vibration and dust	All	Clearing and construction phases
Loss or fragmentation of MNES habitat and reduced connectivity	- Removal of vegetation that provides foraging and/or breeding habitat for a threatened species and ecological communities. Injury or death during clearing. - Reduction in ability for threatened MNES species to disperse to adjacent habitat and move safely through the area	All	Clearing and construction phases
Introduction and spread of invasive flora species	- Limits species mobility - Increased fire fuel load and risk of severe bushfire - Habitat degradation and competition for resources.	Koala, Squatter Pigeon	All phases
Introduction and spread of invasive fauna species	Injury or mortality to predation by feral pest fauna species.	All	All phases
Habitat degradation by increased dust run-off and sedimentation	Smothering of plants and habitat degradation	All	All phases
Barrier effects	Restricts/limits bird and bat movements between essential resources, such as foraging and roosting areas	Birds and bats	Construction and operational phases
Disturbance to wildlife through increased light, noise and vibration	Disruption to behaviours and the balance of inter-species interactions.	Koala, Greater Glider	All phases

5. PRINCIPLES FOR DEVELOPING MNES MANAGEMENT ACTIONS

5.1. Avoid, mitigate and manage hierarchy

This Plan has been developed considering the following management principles (in order of preference):

- **Avoidance** – Avoiding direct and indirect adverse impacts where possible.
- **Mitigate** – Mitigating direct and indirect adverse impacts where impacts cannot be avoided.
- **Manage** – Implement management actions to prevent or reduce impacts.
- **Offset** – Offsets for potential significant, residual impacts to MNES which are addressed separately in accordance with the EPBC Act approval conditions.

Proposed avoidance, mitigation and management measures will be carried out continuously for the life of the project and will be adapted during the different Project phases. These avoidance, mitigation and management measures will be based upon the best available information and will include the following:

- Performance criteria;
- Action to be undertaken;
- How it will be done;
- Where it will be implemented in relation to the MNES and/or habitat and impact/action;
- When it will be implemented in relation to the impact/action, the Project stage and where relevant time of year and at what frequency/duration; and
- Who is responsible for taking that action.

5.2. SMART Principles

Measures in this Plan have been developed in accordance with the S.M.A.R.T principles, which are:

- **Specific** – Measures are focused, specific and identify a tangible outcome for target MNES species.
- **Measurable** – Measures are quantified with an indicator of progress through ongoing monitoring programs.
- **Achievable** – Reviewing what can realistically be achieved given available resources. Measures are designed to be scientifically robust, practicable and realistically able to be implemented. Relevant – Measures are developed and utilize resources to purposefully contribute to MNES Plan. Measures are relevant to target MNES species.
- **Time-bound** – Measures are time-bound with a specified timeframe in which it can be achieved, which are provided in this document.

Measures proposed within this Plan have been developed specific to the MNES based on each species' habitat and ecological requirements listed in respective conservation advice (Table 7-2). Measures have been developed to be measurable and repeatable with ongoing monitoring programs and able to provide results that are comparable as outlined in Table 7-1.

The measures are designed to be practical and reasonably able to be implemented in the Project area and the given timeline for each activity in each phase of the Project. Performance outcomes and corrective actions have been proposed to ensure measures are working effectively and towards an achievable outcome. Each measure is relevant to MNES and has been developed with the aim of maintaining the Project Area in a condition that supports the essential life processes for each species. The timing of implementation of each measure is provided, as well as monitoring requirements which in some cases last the lifetime of the approval.

5.3. Adaptive management

This plan uses an adaptive management approach, whereby management measures set out in the Plan may be amended in accordance with EPBC 2020/8867 approval conditions 64 – 69 “Revision of management plans” to ensure effective management and mitigation are implemented. A suitably qualified person will draft any amended management measures or monitoring, including training of personnel, data analysis, interpretation, and reporting.

To ensure the effectiveness of the Plan, all activities are subject to regular review and reporting. The Plan reviews will be undertaken as a minimum every three years as part of a continual improvement process.

Triggers for the Plan review will include (but not be limited to):

- A reportable incident as defined in the CoA
- Mortality or injury of EPBC Act listed flora or fauna
- Identification of an EPBC Act matter on site not listed under this Plan.

The outcome of the reviews may result in amendments to the Plan and related documentation, risk assessment review, re-evaluation of objectives and targets, as well as updates to other Project documents.

Any updates to the Plan will include evaluation of environmental management performance against the Plan’s objectives and performance targets, and subsequent review and regulatory approval of revised versions of the Plan. This will include:

- An updated risk assessment, including in response to changing circumstances or in light of the results from implementing contingency response/corrective actions;
- Review the effectiveness of management measures ;
- Identification of areas for improvement of environmental management and performance;
- Assessment the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Assessment of the effectiveness of the corrective and preventative actions;
- Documentation any changes in procedures; and
- Assess attainment of the Plan’s environmental objectives against the performance indicators.

6. MNES OUTCOMES

This section presents information on environmental outcomes to be achieved through implementation of this Plan, and management to achieve these outcomes. This information supports the avoidance, mitigation and management measures outlined in Section 7. Proposed outcomes have been developed for each relevant MNES.

Table 6-1 MNES Environmental Outcomes

MNES	Outcomes
Koala	• Avoid and minimise injury and mortality to Koala through the use of best management practices; • Prevent the introduction and spread of weeds that might restrict Koala movement through the Project disturbance footprint; • Prevent the introduction of invasive fauna that may predate Koala; • Implementation of pest fauna management programs reduce threats to Koala.
Greater Glider	• Avoid and minimise injury and mortality to Greater Gliders through the use of best management practices; • Prevent the introduction of invasive fauna that may predate Greater Glider; • Implementation of pest fauna management programs reduce threats to Greater Glider.
Squatter Pigeon	• Avoid and minimise injury and mortality to Squatter Pigeon through the use of best management practices; • Prevent the introduction and spread of weeds that might reduce habitat quality for Squatter Pigeon; • Prevent the introduction of invasive fauna that may degrade habitat and/or predate Squatter Pigeon; • Implementation of pest fauna management programs reduce threats to Squatter Pigeon.
Migratory birds (Black-faced Monarch, Rufous Fantail, Satin Flycatcher)	• A pest fauna control program will be implemented for the duration of the approval to ensure that pest fauna are not spread; • Bushfire management measures will be implemented to minimise the potential risk of starting bushfires from Project activities; • Spotter catcher to check area for roosting birds or nests prior to clearing.

7. AVOIDANCE, MITIGATION AND MANAGEMENT ACTIONS

Measures developed for this Plan are specific to the target MNES species and can be measured through ongoing monitoring programs. The measures are designed to be scientifically robust and based on best available research with additional consideration to ensure they are practical and reasonably able to be implemented. Each measure is relevant to MNES and has been developed with the aim of avoiding and mitigating potential impacts. The timing of implementation of each measure is provided, as well as monitoring requirements. Table 7-1 presents proposed avoidance, mitigation, and management measures whilst Table 7-2 provides species-specific measures for MNES in accordance with approved conservation advice.

7.1. Avoid and minimise impacts

In addition to design measures implemented through impact assessment phase of the project, additional measures to avoid and minimise potential impacts to MNES will be implemented as. The design and layout of Project infrastructure will continue to be refined as the Project progresses. Updates to the design will be informed by the results of wind resource monitoring and modelling, geotechnical surveys, civil designs, ecological constraints and the results of pre-clearance surveys. Ongoing avoidance and minimisation of potential impacts will be considered in the design with the following priorities :

- Minimising clearing within the riparian vegetation community (which also incorporates core Greater Glider habitat).
- Minimising clearing within high value Greater Glider mixed Eucalyptus Woodland.
- Final detailed design of road and overhead powerline alignments to minimise the overall clearing footprint to the greatest, whilst also reducing the overall loss of Koala and Greater Glider habitat.

A summary of avoidance, minimisation and mitigation measures that will be undertaken are outlined in Table 7-1. For absence of doubt, no changes are proposed to the disturbance limits set out in CoA 4 that outlines the disturbance limits for each MNES.

Table 7-1 Avoidance, Mitigation and Management Actions

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Clearing of native vegetation and/or disturbance to MNES habitats does not occur outside of the approved Disturbance Footprint	All	The extent of vegetation clearing (and no-go areas) will be clearly identified on construction plans and plant and equipment used for clearing will have GPS and spatial data loaded to ensure clearing only occurs in approved areas. In addition, a permit to disturb process will be implemented to ensure appropriate controls are in place. Internal training will occur for all personnel involved in the vegetation clearing phase to ensure they are aware of the approved works areas, the requirements they need to meet, and sensitivity of the area for MNES. Clearing will be undertaken as per methods in Section 7.3 and Section 7.4.	Within approved clearing areas.	Prior to and during vegetation clearing.	High – proposed measures are likely to minimise risks of clearing outside the approved footprint	Staff may not follow measures outlined in this Plan which could lead to impacts on vegetation and habitat outside the Disturbance Footprint.	Review processes for communicating and identifying approved areas for clearing works. Increase monitoring and control where required. Rehabilitation of any areas of disturbance outside the Disturbance Footprint.
Retain areas of MNES habitats and/or mature, large trees, hollow-bearing trees or large stags as potential nesting and roosting habitat.	All	A suitably qualified FSC will undertake pre-clearance surveys (see Section 7.2) and will identify large trees, hollow-bearing trees or large stags that can be avoided or handled under specific direction. The FSC will be present during any habitat disturbance. Micro-siting of turbines, roads, underground cabling and other infrastructure, to reduce or avoid ecological impacts: Clearing is to be undertaken as per methods in Section 7.3 and Section 7.4.	Within approved clearing areas.	Prior to and during vegetation clearing.	Moderate - many habitat features will not be able to be avoided or successfully relocated without damage.	Habitat features not detected during pre-clearance surveys may be impacted. Some hollows from felled trees are likely to be too damaged for effective relocation.	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys. All injured fauna will be removed from site and taken to a veterinary clinic or wildlife carer.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Minimise the introduction, establishment and spread of declared weeds or pests, especially preventing establishment or spread in new areas (specifically into the bordering Clarke-Connors Ranges).	All	Implement actions outlined in the Weed and Pest Management Procedure. All vehicles, machinery, plant, equipment and material will be washed down prior to entry to the Project area. Site inductions will include information and training on weed and pests, including identification and measures to prevent spread.	Within the disturbance footprint.	During construction works and for the duration of the Project.	Moderate - weed hygiene practices will reduce the likelihood of introducing new weeds or spreading existing ones. Some weeds are very easily spread and could potentially spread during construction.	Weed encroachment and associated degradation of habitat.	Report weed and pest species to environmental supervisor. Weed protocol retraining for relevant staff.
Targeted weed and pest management is undertaken within the Disturbance Footprint.	All	Suitably qualified weed management contractor is engaged to treat target weed species within the Development Footprint. Weed management is undertaken every six months during construction and annually thereafter. A pest fauna management program is developed in consultation with the landholder and implemented every six months during construction and then annually thereafter.	Within the Project disturbance footprint.	During construction works weed and pest control will be undertaken every six months and then annually for the duration of the Project.	High – target weed species are easily identifiable and not readily spread by movement of equipment through the Disturbance Footprint. These weed species are easily treated with well-established techniques. Moderate - target pest fauna persist at a landscape level, with potential restrictions associated with the effectiveness of control associated with linear infrastructure. Effectiveness of control also subject to coordination with adjacent landholders.	Weed encroachment and associated degradation of habitat. Pests may impact threatened species.	Report pest species to environmental supervisor. Increase frequency of weed or pest treatments as required.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
All potential Greater Glider Hollows will be salvaged and installed within retained vegetation	Greater glider	Pre-clearance surveys will be undertaken by a suitably qualified and experienced FSC, prior to clearing (as set out in Section 7.2). The pre-clearance surveys will commit to the following: • Areas of predicted / mapped habitat for MNES species that have the potential to occur within the clearing footprint will be specifically targeted to search for micro-habitat features for salvage. • Individual breeding places for (relevant) MNES species will be identified, marked and mapped to direct FSC in managing impacts to breeding places during clearing. • Potential Greater Glider hollows will be identified for salvage prior to clearing as per requirements set out in Section 7.3 and Section 7.5. • Salvaged hollows will be monitored for the evidence of use by Greater Gliders and results included in the annual reporting (see Section 9.1.1).	Within MNES habitat areas.	Prior to vegetation clearing.	Moderate (pre-clearance surveys) – some hollows may not be identified during pre-clearance surveys. Moderate (hollow salvage) – some hollows may be damaged during salvage process	Species not detected during pre-clearance surveys may be impacted. Relocated hollows not utilised by Greater Gliders	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys. Any injured fauna will be removed from site and taken to a veterinary clinic or wildlife carer. Greater Glider hollows that are unable to be salvaged (e.g. due to damage to the hollow or unsuitability for salvage and relocation) will be replaced by nest boxes. Constructed nest boxes will be available on site in case natural hollows are not able to be salvaged and installed. Nest boxes be installed as per requirements set out in Section 7.5

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Install glider poles to maintain connectivity in areas of Greater Glider habitat as required.	Greater Glider	Assess areas of mapped Greater Glider habitat to identify locations where glider poles are required to maintain connectivity. Where clearing widths create a gap between large trees (>30cm DBH) that is more than 1.2 times the canopy height, glider poles will be installed to maintain connectivity. Glider poles will be installed following Taylor (2010) and occur at least every 500 m in areas to be cleared where Greater Glider habitat is present. Where road widths have been cleared in Greater Glider habitat this will be no wider than 15m for a length of 50m. One section of 15m wide road is required per 500m of Greater Glider habitat fragmented by the development footprint.	Within high value MNES habitat areas.	During construction	Low - Glider poles and crossing structures can be effective in some areas. Greater Gliders are known to be sensitive to disturbance.	Greater Gliders may not use the crossing structures which could lead to fragmentation of habitat.	Undertake monitoring of glider pole usage. Install alternative crossing infrastructure such as rope bridges if glider poles are not used and an active Greater Glider population is identified.
Minimise potential impacts to Koala during clearing.	Koala	All clearing will be supervised by suitably qualified and experienced fauna spotter catchers with a current rehabilitation permit ² . Clearing will be undertaken in a manner to minimise impacts to Koala as outlined in Section 7.3.1.	Development Footprint	Construction	High – canopy searches for Koala will be undertaken and clearing will not commence until the FSC is satisfied with assessment. Koala sensitive clearing practices are well established and minimise direct impacts to Koala.	Species not detected during pre-clearance surveys may be impacted	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys. All injured fauna will be removed from site and taken to a veterinary clinic or wildlife carer.

² Holding a valid rehabilitation permit will ensure that clearing is undertaken in a manner that is consistent with the *Nature Conservation (Koala) Conservation Plan 2017* and clearing of the Koala habitat trees is carried out in a way that ensures Koalas on the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Minimise potential impacts to Greater Glider during clearing.	Greater Glider	All clearing will be supervised by suitably qualified and experienced fauna spotter catchers with a current rehabilitation permit following methods outlined in Section 7.3.2. Hollow-bearing trees to be avoided where possible. Clearing of trees containing hollows will be cleared using fauna sensitive techniques (Section 7.4).	Development Footprint	During vegetation clearing	Moderate - Hollows that may be preferred by Greater Glider will be identified prior to clearing.	Species not detected during pre-clearance surveys may be impacted.	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys. All injured fauna will be removed from site and taken to a veterinary clinic or wildlife carer.
Minimise potential impacts to Squatter Pigeon during clearing.	Squatter Pigeon	All clearing will be supervised by suitably qualified and experienced FSC. Undertake pre-clearance surveys prior to any vegetation clearing. The FSC will check area for nests and birds (by flushing) prior to clearing. Clearing will not commence until individuals have left the area to be cleared. Squatter Pigeon nests will be identified during pre-clearance surveys. An exclusion zone will be established around any active Squatter Pigeon nests until young have fledged.	Development Footprint	During construction	High – flushing species facilitates dispersal into undisturbed areas. Ground nests of Squatter Pigeon are easily identifiable.	Species not detected during pre-clearance surveys may be impacted.	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys.
Minimise potential impacts to migratory species during clearing.	White-throated Needletail	All clearing will be supervised by suitably qualified and experienced FSC. Undertake pre-clearance surveys prior to any vegetation clearing. No clearing if migratory species are roosting.	Development Footprint	During vegetation clearing	High - species is easily identifiable and not readily impacted by vegetation clearing works.	Species not detected during pre-clearance surveys may be impacted.	Fauna spotter catcher will be on site to remove or relocate fauna not detected during pre-clearance surveys. All injured fauna will be removed from site and taken to a veterinary clinic or wildlife carer.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Ensure site personnel are aware of MNES.	All	Site inductions will include information on MNES species that have the potential to occur within the Project area. Additionally, information will be included toolbox talks, pre-starts and targeted training as required as outlined in Section 10.2. Staff training and site briefing to communicate environmental features to be protected and measures to be implemented.	All areas	Construction and operation	Moderate - training and site briefings will educate staff to be aware of MNES.	Staff may not follow their training which could lead to impacts to MNES.	Implement induction and re-training for staff on environmental issues in instances of non-compliance.
No MNES impacted by vehicle strike.	All	All vehicles to observe designated speed limit of 60km/hr within the development footprint in areas mapped as Koala habitat or Squatter Pigeon breeding habitat as outlined in Section 7.120, reduced to 40km/hr outside of daylight hours. Install Squatter Pigeon awareness signage at the entry to breeding habitat. Install Koala awareness signage during breeding season when the species is highly mobile (October to June) in areas of high value habitat. Site inductions will include information on MNES species that have the potential to occur within the Project area and to communicate impacts of traffic strikes on native fauna. A register of Squatter Pigeon sightings will be maintained to identify current areas that have a risk of collision.	Roads and access tracks within the Project footprint.	At all times	Moderate - training and site briefings will educate staff but if the training is not followed, some mitigations may not be adhered to. Moderate - staff training may not be effective at changing staff behaviour and traffic strikes may still occur.	Staff may not follow their training which could lead to impacts on native vegetation and threatened fauna. Fauna strikes from vehicles.	Implement site wide induction and retraining for all staff on environmental issues in instances of non-compliance. Increase environmental compliance inspections. Distribute this Plan as part of inductions to site. Implement site wide induction and re-training for all staff on environmental issues in instances of non-compliance.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Rehabilitate temporary clearance areas within 6 months of completion of construction with local native flora species to minimise erosion and sediment runoff.	All	Areas disturbed during construction that are no longer required for operations (road batters, cabling routes and temporary facilities) are stabilised and rehabilitated progressively during construction. Rehabilitation will be undertaken with native flora species and achieve 70% cover relative to undisturbed sites adjacent disturbed areas within 6 months of completion of construction. In high erosion risk areas 70% groundcover objective may be achieved by other means (e.g. installed rock protection or equivalent) in accordance with IECA 2008³ Topsoil, where available, will be stockpiled and protected separately to support rehabilitation works.	Temporary clearance areas within the Disturbance Footprint.	Construction	Moderate – the success of rehabilitation and stabilisation of temporary clearance areas will be dependent on climatic conditions.	Where rehabilitation is not successful, erosion and sediment runoff may impact areas of adjacent habitat.	Investigate causes of unsuccessful rehabilitation. Use alternative rehabilitation methods including hydro-seeding and hydro-mulching.
Minimise risk of sediment runoff into watercourses.	All	Erosion and sediment control measures will be implemented in accordance with the <i>Best Practice Erosion & Sediment Control Guideline</i> (IECA 2008) as outlined in Section 7.13. Temporary construction areas will be rehabilitated as soon as they are no longer required for construction. Soil stockpiles will not be created within 50m of watercourses.	Areas where earthworks have occurred. Particular focus at sites adjacent to watercourses.	Install sediment and erosion control measures prior to, and during the construction phase.	Moderate - Erosion and sediment controls will minimise risks associated with sediment transport in accordance with IECA guidelines.	Impacts may occur if erosion and sediment control plan is not implemented appropriately. Impacts may occur to waterways if erosion and sediment control plan is not implemented appropriately.	Review the effectiveness of erosion and sediment control measures. Maintain erosion and sediment control measures as per design criteria.

³ Refers to the International Erosion Control Association Australasia (IECA) (2008) Best Practice Erosion and Sediment Control Manual.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Dust generated from construction and operation does not adversely impact MNES habitat.	All	Dust suppression (e.g. watering or polymer application) is to be carried out unsealed access roads and other disturbed areas to limit generation of dust where required. All temporary soil stockpiles will be covered, stabilised and/or moistened as required to minimise generation of dust.	Areas where earthworks have occurred. Particular focus in areas of high value MNES habitat.	For the duration of the project	Moderate - dust suppression will suppress most dust but not all.	Dust may suppress growth of vegetation.	Investigate causes of dust. Increase dust suppression strategies where required.
No light impacts to MNES	All	If undertaking nightworks, lights (both during nightworks and operation where necessary) will be directed away from vegetation and adjacent habitats. Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill. Use best practice light design in accordance with the <i>National Light Pollution Guidelines (DoEE 2020) (static lighting)</i> . Schedule minimal night works.	Disturbance Footprint	All phases of the Project	High - the implementation of best practice light design and limiting night work will reduce impacts to fauna.	None	Assess and update lighting design as required.
No uncontrolled bushfire caused by activities undertaken for the Project.	All	Implement hot works permit process to minimise the risk of starting bushfires. Work with the Queensland Rural Fire Service to allow access and use of access tracks for bushfire response.	Disturbance Footprint.	All phases of the Project	High - provided the measures in the plan are followed, bushfire risk should be equal to that currently within the Project Site.	Uncontrolled bushfires in high fuel load situations may impact MNES.	Report all fire risks to safety officer. Report all fires to 000 and local fire brigade.

Performance Criteria	Applicable MNES	Method	Location	Timing and Frequency	Effectiveness of Methods	Risk of Residual Impacts	Corrective / Mitigation Actions
Minimise effects to MNES life-cycle events	Koala, Greater Glider, Squatter Pigeon	Pre-clearance surveys to detect MNES, evidence of hollow use, breeding activity or Squatter pigeon nesting in the disturbance area, with particular regard to the breeding cycles below. Koala – Breeding can occur year-round for Koala, with a higher concentration of births in December-March in northern areas of Qld that experience greater seasonality to rainfall. Weening occurs 12 months after birth and is thus on the same cycle (DAWE 2022). Greater Glider – Births occur from March to June (DCCEEW 2022). Squatter Pigeon – Breeding can occur through most of the year. Peak breeding period is not fixed but is likely to coincide with the dry season (April to October) when food (grass seed) is most abundant (DoE 2024).	Disturbance Footprint	During vegetation clearing and Construction	Koala – Moderate – despite sensitive clearing methods, breeding behaviour may be disrupted by clearing and construction disturbance. Greater Glider - Moderate – not all hollows will be detected prior to clearing so some hollows containing fauna will be destroyed. Breeding behaviour may be disrupted by vegetation clearing and construction disturbance. Squatter Pigeon – Moderate – not all nests will be detected prior to clearing so some may be destroyed. Breeding behaviour may be disrupted by vegetation clearing and construction disturbance.	Species not detected during pre-clearance surveys may be impacted.	Fauna Spotter Catcher to be on site to remove or relocate fauna not detected during pre-clearance surveys. Evidence of MNES breeding/nesting during pre-clearance surveys will be recorded and monitored to ensure the nesting/ breeding activity has ceased before clearing and construction in the particular area continues. All injured fauna will be removed from site and taken to a veterinary clinic or wild-life carer.

Table 7-2 Species Specific Mitigation Measures

Species	Relevant conservation advice or recovery plan	Threats or recovery actions	Proposed mitigation measures
Koala	Conservation Advice for the <i>Phascolarctos cinereus</i> (Koala) combined populations of Queensland, New South Wales and ACT (DAWE 2022)	- Loss of climatically suitable habitat - Increased intensity of drought heatwaves, bushfire - Declining nutritional value of foliage - Clearing and degradation of habitat	- Fauna spotter catchers to check each tree for Koala prior to clearing - Koalas in the Development Footprint to be allowed to move in their own time - Staged clearing procedures to be undertaken in Koala habitat

Species	Relevant conservation advice or recovery plan	Threats or recovery actions	Proposed mitigation measures
	National Recovery Plan for the Koala <i>Phascolarctos cinereus</i> (combined populations of Queensland, NSW and ACT)	- Mortality caused by dogs and vehicles - Disease	- Pest fauna control measures implemented during construction and operation to reduce predator threats - Wildlife friendly fencing to be used where possible to ensure Koalas can move through the landscape - Speed limit of 60km/hr within the development footprint in areas mapped as Koala habitat during construction and operation, reduced to 40km/hr outside of daylight hours.
Greater Glider	- Conservation Advice for the <i>Petauroides volans</i> (Greater Glider southern and central) (DCCEEW, 2022) - No recovery plan is publicly available for this species.	- Inappropriate fire regimes - Habitat clearing and fragmentation - Timber harvesting - Barbed wire fencing - Increased temperatures and changes in rainfall - Hyper-predation by owls - Competition with Sulphur-crested Cockatoos - Predation by Feral Cats and European Red Fox	- Locate temporary infrastructure outside mature vegetation - Hollows used by Greater Gliders (and next boxes) will be relocated in accordance with requirements set out in Section 7.5 - Where new fencing is required by the Project that may intersect with Greater Glider habitat, wildlife friendly fencing will be used (no barbed wire on the top strand) - Spotter catcher to check all HBTs in Greater Glider habitat prior to felling
Squatter Pigeon	- Conservation Advice <i>Geophaps scripta scripta</i> - No recovery plan is publicly available for this species.	- Overgrazing by livestock and introduced pests such as European Rabbit (<i>Oryctolagus cuniculus</i>) - Introduced weeds - Inappropriate fire regimes - Thickening of understorey vegetation - Trampling of nests by stock - Clearance of habitat - Reduction in abundance of natural food plants	- Weed hygiene and control measures will be implemented during construction and operation - Spotter catcher to check area for nests prior to clearing. - Allow natural regeneration of native grasses under powerlines and other infrastructure to provide foraging opportunities for Squatter Pigeon. - Speed limit of 60km/hr within the Disturbance Footprint in areas mapped as Squatter Pigeon breeding habitat, reduced to 40km/hr outside of daylight hours.
White-throated Needletail	- Conservation Advice <i>Hirundapus caudacutus</i> - No recovery plan is publicly available for this species.	- Habitat loss and fragmentation - Collisions with artificial structures (e.g. wind turbines, powerlines), and - Secondary poisoning (e.g. insecticides).	Spotter Catcher to check for roosting birds prior to clearing and ensure species is not present.

7.2. Pre-clearance management actions

Prior to clearing at any location within the Development Footprint, the following assessment will be undertaken:

1. Identify areas where clearing, earthworks and/or alterations to a waterway corridor (i.e. construction of bridges, culverts, etc.) will be required.
2. Complete a pre-clearance desktop assessment to identify potential.
3. Confirm that the planned clearing is within the Project Area specified in Attachments A1- A22 of EPBC 2020/8867 CoA and that it is also within the approved clearing limits (EPBC Decision Notice).
4. Ensure clearing boundary is delineated clearly on mapping software and available to clearing works personnel.
5. Pre-clearance survey undertaken prior to clearing (as outlined in Section 7.2.2).
6. Quantify baseline weed and pest abundance prior to clearing (methods outlined in Section 7.2.3)

7.2.1. Delineating the clearing boundary

All plant operators involved in clearing will have spatial data of the clearing boundary loaded to ensure works are undertaken within approved areas. Additionally, a Permit to disturb system will be implemented for all works in the disturbance area to ensure:

- Pre-clearance surveys for a particular area are completed prior to works in that area commencing.
- GPS and mapping is available and relevant for all plant operators and plant machinery.

Additional physical demarcation of the Development Footprint after initial clearing will be undertaken in areas of sensitive vegetation using the following; stockpiled topsoil or vegetation, earthworks bunding and flagging as required.

7.2.2. Pre-clearance surveys

Prior to clearing works commencing in any location within the Disturbance Footprint, vegetation to be cleared will be inspected by a fauna spotter catcher that meets the following definition:

A suitably qualified fauna spotter catcher (FSC) is a person authorised under the *Nature Conservation Act 1992* (Qld), and operating in accordance with requirements of a current Rehabilitation Permit, to detect, capture, care for, assess, and release wildlife disturbed by clearing who has at least 3 years' experience undertaking this work with the protected species.

The FSC will undertake a pre-clearance survey of vegetation within the clearing boundary of the Contractor's respective scope of work, no more than four weeks of commencing works in a particular area. This pre-clearance survey will identify, record, and mark:

- Presence of Koalas or migratory species by undertaking canopy searches
- Trees with hollows and nests
- Trees within mapped Greater Glider habitat that have a DBH >30cm (requires further survey and assessment of potential use by Greater Gliders as outlined in Section 7.3.2)
- Threatened flora
- Weeds and pests (see additional methodology below)
- Other general fauna habitat features.

Fauna habitat features will be clearly recorded and marked in order to identify those which will be inspected immediately prior to clearing and then be felled or removed with care. This includes large trees and HBT, which are trees that provide or potentially provide a number of resources including:

- Hollows, fissures or cracks
- Hollow logs on ground
- Stags
- Suitable foraging trees with diameter at breast height (DBH) >30cm
- Large canopy spread
- Significant foraging resources for fauna.

In areas with surface rocks and timber, the FSC will search for terrestrial reptiles and mammals and relocate immediately prior to clearing.

Pre-clearance weed and pest surveys will be conducted to quantify baseline abundance of target weed and pest fauna species within the Disturbance Footprint. Target weed species that may impact MNES species are defined as; any restricted matter under the *Biosecurity Act 2014*, listed as Weeds of National Significance (WoNS), or high priority weeds from the Isaac Regional Council Biosecurity Plan (Isaac Regional Council 2024). Target pest fauna species that are known to occur in the area and may impact MNES species include; wild dogs, cats and foxes.

Baseline weed surveys will involve undertaking 300 m long transect counts of target weeds at a minimum of 10 separate locations within the Disturbance Footprint in following methodologies outlined in the *NSW Government Monitoring Manual for Invasive and Native Flora* (Watson et al 2021). The density of weeds will be measured at each transect by surveying 15 m either side of the centre line (creating a 300 x 30 m quadrat, with sample area of 9,000 m²). Weed density calculations will be generated for each species at each site and expressed as an overall density across the Disturbance Footprint.

Baseline pest fauna surveys will be undertaken to generate an activity index for Dogs, Foxes and Cats in accordance with the protocol recommended by Kays et al (2020). The index provides a measure of relative abundance for each species. At least 10 camera traps will be deployed within Disturbance Footprint for a duration of 4 weeks prior to construction activities occurring in the vicinity. Camera traps will be unbaited to avoid interference with predator behaviour and false increases in activity indices. Camera traps will be set at 1 m above the ground on a post or tree, and if on a track, at an angle of 45 degrees to the track to increase detection rates.

7.3. Clearing approach

A suitably qualified FSC will be present during all habitat clearance activities, with the authority to cease habitat clearance for an appropriate timeframe where MNES may be impacted. Fauna spotter catcher responsibilities will be undertaken in accordance with the *Draft Queensland Code of Practice for the welfare of wild animals affected by land-clearing and other habitat impacts and wildlife spotter/catchers* (Hanger & Nottidge, 2009) (the code of practice).

Sequential and staged clearing will be used throughout the Disturbance Footprint in accordance with Part 3 Section 10 of the *Nature Conservation (Koala) Conservation Plan 2017* (Qld). Trees will be progressively cleared to enable fauna residing in, or near the clearing site, enough time to vacate the clearing area and move into adjacent vegetation without human intervention as much as possible.

In addition to general FSC responsibilities during clearing, additional species-specific methods will be implemented for Koala and Greater Glider as outlined in the following sections.

7.3.1. Koala clearing methods

Pre-clearance surveys will involve canopy searches to identify Koalas in advance of clearing activities, as part of the best practice methods under the *Koala Sensitive Design Guideline* (DES 2020). Where a Koala has been identified, the tree will be flagged with tape or fluorescent spray-paint, along with any tree with an overlapping crown. None of the flagged trees nor trees at risk of falling onto the tree with identified Koala will be cleared until the Koala has moved on of its own accord.

In areas of potential Koala habitat the clearing will be undertaken in a manner consistent with Part 3 s(10)3a-c of the *Nature Conservation (Koala) Conservation Plan 2017* that defines the process for sequential clearing⁴. The sequential clearing condition approach will involve following:

- Stepping stones will include small patches of Koala habitat area (e.g. areas less than 2 ha), patches of other vegetation that includes scattered Koala habitat trees or a single Koala habitat tree.
- Stepping stones will be as close as possible and will be a minimum of 100m from large Koala habitat areas or other stepping stones as this is the average distance that a female Koala will move in a day.
- Clearing of the Koala habitat trees is carried out in a way that ensures Koalas on the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention.
- Clearing of the Koala habitat trees is carried out in a way that ensures, while the clearing is carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent area, to allow Koalas living on the site to move out of the site.
- No Koala habitat tree in which a Koala is present, and no Koala habitat tree with a crown overlapping a tree in which a Koala is present, is cleared.

7.3.2. Greater Glider methods

Pre-clearance surveys in all areas of mapped Greater Glider habitat within the Disturbance Footprint will be undertaken to identify potential Greater Glider Hollows⁵. These surveys will include canopy searches and identification of potential suitably sized tree hollows as part of pre-clearance surveys, including the identification of any trees within the disturbance footprint with a DBH >30cm. Where trees with a DBH >30cm are identified, these trees will be checked for hollows with openings larger than 8cm diameter and evidence of use by Greater Glider via scat and scratch searches at and around the tree. Where identified, these trees will be recorded as containing potential Greater Glider hollows.

Where any hollows are identified as being utilised by Greater Gliders as per the definition of Evidence Greater Glider use⁶ from the Conditions of Approval (see Section 7.5), measurements of the height and aspect will be made. In addition, the tree species will also be recorded where trees are alive. This data will be used to inform the installation of salvaged or artificial hollows in nearby suitable habitat. Any hollows to be salvaged will have a number of observations and measurements recorded including depth and height. Hollows and nest box installation will be undertaken in accordance with methods outlined in Section 7.5 and best practice information on Greater Glider hollow and nest box installation (RTA 2011, TMR 2010).

⁴ Note that the Project is not located within a Koala district as defined by under the policy, but the approach to clearing will be applied regardless

⁵ As per EPBC Act approval definition; *Greater Glider Hollows are hollows with openings larger than 8cm diameter that are known to have evidence of Greater Glider use and are in trees with a diameter at breast height >30 cm.*

⁶ As per EPBC Act approval definition; *Evidence of Greater Glider use includes, but is not limited to, observing Greater Glider using the hollow, presence of scats within the hollow or around the tree, presence of Greater Glider fur within or around the Greater Glider hollow entrance.*

Greater Gliders (as with other arboreal fauna) will be given the opportunity to disperse from the area once clearing has commenced. To encourage this to occur, sequential clearing will occur in areas (where HBTs might otherwise become isolated) to allow dispersal corridors to link vegetation within clearing areas to adjacent areas of retained habitat. Such corridors could consist of a single row of trees no more than 30 -40m apart that will act as 'stepping stones' to allow Greater Gliders to glide from tree to tree.

Trees with potential Greater Glider Hollows be tapped before felling and left overnight to allow for fauna to self-relocate. If Greater Gliders are potentially still present, trees will be either lowered with machinery fitted with a vertical tree-grab attachment using its boom to slow the trees fall, or the tree will be dismantled in sections.

7.4. Sensitive clearing technique

A sensitive clearing technique will be implemented to fell HBTs to minimise impacts to fauna. HBTs will be felled in a manner which reduces potential for fauna mortality. Trees will be tapped before felling and left overnight to allow for fauna to self-relocate. The fauna spotter catcher will determine which trees will be felled using the sensitive clearing technique. HBT will not be pushed and allowed to fall under their own weight. After felling, HBT will be inspected by a fauna spotter to determine if any animals are present. Fauna spotters will capture and safely release any uninjured fauna present. Injured wildlife will be transported to the nearest wildlife carer (see Section 7.7). Handling of fauna will be undertaken in accordance with best practice as detailed in the Australian Wildlife Conservancy *trapping handling and sampling guidelines* (AWC 2013).

Within areas of Greater Glider habitat, every 500 metres there will be a section of road where the maximum width that is to be cleared is 15 metres, for a minimum of 50 metres length along the linear clearing. Areas outside these narrowed sections will remain at the minimum width necessary for construction.

7.5. Hollow relocation and nest box installation

The Conditions of Approval for Lotus Creek Wind Farm (EPBC 2020/8867) includes the following definitions regarding Greater Gliders and Greater Glider Hollows:

- **Clear/clearing/cleared/clearance** means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation.
- **Evidence of Greater Glider** use includes, but is not limited to, observing **Greater Glider** using the hollow, presence of scats within the hollow or around the tree, presence of **Greater Glider** fur within or around the **Greater Glider hollow** entrance.
- **Greater Glider** means the **EPBC Act** listed threatened species *Petauroides volans* (greater glider (southern and central) and subsequent listing statuses under the **EPBC Act**.
- **Greater Glider hollow/s** are hollows with openings larger than 8cm diameter that are known to have **evidence of Greater Glider** use and are in trees with a diameter at breast height >30 cm.

All hollow relocations and nest box installations will follow the requirements of Attachment E of the Conditions of Approval for Lotus Creek Wind Farm (EPBC 2020/8867):

Prior to **clearing** the approval holder must:

- a. ensure all **Greater Glider hollows** to be **cleared** as a result of the action are inspected for **Greater Gliders**;
- b. ensure the use of techniques to encourage **Greater Gliders** to leave their hollows prior to removal of any tree, including tapping trees and using spotlights. If **Greater Gliders** are potentially present, trees must be dismantled in sections;

- c. ensure that the height and orientation of the **Greater Glider hollow** and the species of tree it is derived from must be recorded prior to the salvaging of the hollows;
- d. install **Greater Glider hollows** in the relocation site at a similar orientation, height and tree species as recorded in the above condition;
- e. determine the depth and height of the **Greater Glider hollows** prior to salvage operation and retained in the salvage operation;
- f. ensure after harvesting, the **Greater Glider hollows** are sealed to weather- proof the hollow;
- g. ensure the excised hollows are deep enough to enable the addition of insulation material;
- h. commit to using the sawdust from the harvesting of the tree hollow as insulation in the base of the harvested **Greater Glider hollows**. Insulation material at the base of the hollow must be at least as deep as the thickness of the sides of the hollow. Additional insulation may be required;
- i. ensure **Greater Glider hollow** removal and installation is undertaken by trained arborists;
- j. commit to ensuring host trees, which **Greater Glider hollow** will be installed, are protected from ring-barking;
- k. monitor **Greater Glider hollows** to detect evidence of **Greater Glider** use and monitoring results are to be included in the annual **compliance report** under condition 58.

As such, all potential Greater Glider hollows in the Disturbance Footprint will be identified during pre-clearance surveys as per the definition in the Conditions of Approval by recording all those with a diameter at breast height >30 cm and containing hollows larger than 8cm in diameter. Evidence of Greater Glider use will be determined as per the definition in the above (and in the Conditions of Approval) As per the Conditions of Approval Attachment D (c)(iii), the identified Greater Glider Hollows that are marked to be cleared as a result of the action will be re-located to Greater Glider habitat in areas of retained vegetation or revegetated habitat within the project site, or the Greater Glider offset site to provide additional habitat. Replacement hollows, such as artificial nest boxes will also be installed as a secondary measure where hollows cannot be successfully salvaged or are unsuitable for relocation.

Salvaged hollows and nest boxes will be installed as per the Conditions of Approval Attachment E as provided above. A suitably qualified ecologist will identify nearby suitable habitat for the installation of relocated or artificial Greater Glider hollows. Additionally, nestbox design selection and installation will be based on best practice information from the RTAs Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011).

Any trees with salvaged or artificial hollows installed by the Project will have tree guards to ensure that they are not accidentally impacted in the future.

All felled suitable hollows will undergo a salvage attempt and be removed by chainsaw (operated by a trained arborist). Artificial nest boxes will be available on site to supplement unsalvageable hollows. The salvaged hollow or artificial nest box will be installed in a host tree with similar conditions as where the hollow was found either by a cherry picker (or similar) or trained arborist operating in a team of two. Host tree selection will consider the following conditions of the salvaged hollow or nest box to replicate:

- Height (m) from the ground where the salvaged hollow was removed;
- Depth of the salvaged hollow (for insulation material depth, which will be at least as deep as the thickness of the sides of the hollow);
- Orientation of the hollow;
- Tree species.

Nest box design will be in accordance with Franks and Franks (2003), i.e. hollow entrance 90 mm diameter, rear entrance (to avoid competition from Common Myna (*Acridotheres tristis*)). Any

Greater Gliders which need to be relocated will be released into the nearest salvaged hollow or nest box. Tree guards will be installed on any tree with Greater Glider nest boxes installed to protect from future potential impacts (e.g. agricultural activities including ring-barking etc).

7.6. Glider pole installation

During construction within Greater Glider habitat, glider poles will be installed where the clearing widths of roads is such that distances between trees with trunks of > 300 mm DBH is more than 1.2 times the canopy height. Glider poles will be designed (Taylor and Goldingay, 2009) and installed as per best practice guidance from the *Fauna Sensitive Road Design Guide* (TMR 2010) and following the requirements of the Conditions of Approval such that:

- The height of the poles is no less than canopy height, or a minimum of 20 m above ground level
- The DBH of the poles is no less than 300 mm
- The distance between glider poles and suitable landing platforms on the opposite side of the road is no greater than 1.5 times the height of the pole
- Are designed that a 500 mm horizontal arm is located at the top of the pole, oriented perpendicular to the road, in the direction of travel (i.e. towards the opposing side of the road).

7.7. Wildlife carer information

Where required injured wildlife will be transported to the nearest available wildlife carer. Registered wildlife carers in the region include; Wildlife Rockhampton (0429 469 453), RSPCA 391 Yamba Rd, North Rockhampton (1300 264 625), Rockhampton Vet Clinic QLD (07) 4928 4266 Dean St, Frenchville QLD 4701, and Rockhampton Wildlife Rescue Association Inc 0437 556 744 North Rockhampton QLD 4701.

7.8. Other threatened species

If a nocturnal threatened species, other than a Greater Glider, is recovered, it will be promptly transported by the FSC to a suitable location. The animal will be released near to where it was found just after dusk. If other threatened species are recovered during the pre-clearance or clearance stages, the clearing methodology will be modified to reduce potential risks.

If a threatened species is orphaned or injured by clearing activities, it will be immediately transported to the nearest wildlife hospital for treatment. Any injuries or deaths of threatened fauna species will be reported immediately to the Site Environmental Coordinator. Any death of a threatened fauna species listed under the EPBC Act will be reported to DCCEE in accordance with incident reporting requirements set out in CoA 59.

Handling of fauna will be undertaken in accordance with best practice as detailed in the Australian Wildlife Conservancy *Trapping handling and sampling guidelines* (AWC 2013).

Migratory bird species are unlikely to be directly impacted by construction activities as they are unlikely to utilise habitat within the Development Footprint. In the unlikely event that a migratory bird species is identified as foraging or roosting in the Development Footprint, the FSC will ensure that the species moves on prior to clearing works in the area.

7.9. Weed and pest management procedure

7.9.1. Weed control

Weed species that may impact MNES and present within the Project Site include Weeds of National Significance (WoNS), restricted invasive plants listed under the Queensland *Biosecurity Act 2014*

(Table 7-3). These weed species may increase fuel loads that could exacerbate uncontrolled fires, restrict movement of MNES species or degrade habitat of MNES species.

Table 7-3 Weed species within the Project Site that may impact MNES

Species	WoNS	Biosecurity Act 2014 Status
<i>Lantana camara</i> , Lantana	ü	Restricted invasive plant – Category 3
<i>Opuntia stricta</i> , Common Prickly Pear	ü	Restricted invasive plant – Category 3
<i>Opuntia tomentosa</i> , Velvety Tree Pear	ü	Restricted invasive plant – Category 3
<i>Opuntia streptacantha</i> , Westwood Pear	ü	Restricted invasive plant – Category 3

Weed management will be undertaken to minimise the introduction, spread or increase numbers of target weed species within the Disturbance Footprint and to ensure that weeds are not spread as a result of the action to the bordering Clarke-Connors Ranges.

To minimise potential introduction of weeds, all plant and machinery brought to the Project Site will be required to be certified as weed free (as outlined in Section 7.9.3).

Weeds within the Disturbance Footprint will be treated using recognised and approved control strategies developed in consultation with Isacc Regional Council and landholders. The Centre for Invasive Species Solutions (2021) and Department of Agriculture and Fisheries (2022) outlines suggested control methods for target weed species (Table 7-4).

Target weeds within the Disturbance Footprint will be treated every six months during construction, and then on an annual basis for the duration of the approval.

Table 7-4 Control Techniques for Target Weed Species

Species	Proposed Control Method
Velvety tree pear (<i>Opuntia tomentosa</i>) or Common prickly pear (<i>Opuntia stricta</i>) or Westwood pear (<i>Opuntia streptacantha</i>)	Chemical control; Triclopyr 240 g/L + Picloram 120 g/L (e.g. Access)
Lantana (<i>Lantana camara</i>)	- Controlled burns - Manual removal and grubbing - Chemical control; Fluroxypyr 200 g/L (e.g. Flagship 200) or Fluroxypyr 333 g/L (e.g. Starane Advanced)

7.9.2. Pest control

Several pest fauna that may impact MNES have been identified within the Project Site. Predatory pest animal species that may impact MNES are presented in (Table 7-5). Wild Dogs and Cats are listed as key threats to MNES. Pigs also pose a threat to MNES through the degradation of habitat.

Table 7-5 Pest species within the Project Site

Species	Biosecurity Act 2014 Status
<i>Canis familiaris</i> , Wild Dog	Restricted Matter – Category 3, 4, 6

Species	Biosecurity Act 2014 Status
<i>Felis catus</i> , Feral Cat	Restricted Matter – Category 3, 4, 6
<i>Sus scrofa</i> , Pig	Restricted Matter – Category 3, 4, 6

A pest fauna control program will be implemented for the duration of the approval to ensure that pest fauna are not spread as a result of the action into the bordering Clarke-Connors Ranges and that pest numbers do not increase during any phase of the Project. Pest control methods will be developed and implemented using best practice approaches, guided by Isaac Regional Council and Department of Agriculture and Fisheries. The intensity of pest control will be varied to ensure that pest numbers do not increase as a result of the Project, and in particular the increased availability of carcasses that may occur from turbine strike. Table 7-6 outlines the recommended pest management strategies for each of these MNES values.

Pest fauna control within the Disturbance Footprint will undertaken by a licenced contractor every six months during construction, and then on an annual basis for the duration of the approval.

Table 7-6 Pest Fauna Control and Monitoring Techniques for Pest Species within Project Site

Target Pest Species to Control	Methods for Monitoring	Possible Control Technique	Most Effective Timing
Wild Dog	Trapping Spotlight counts Track counts Cameras	Soft net traps Cage traps Padded jaw traps Shooting Baiting (both passive and active)	No specific timing required but is most effective if carried out in conjunction with regional control.
Feral Cat	Trapping Spotlight counts Track counts Cameras	Soft net traps Cage traps Padded jaw traps Shooting Baiting (both passive and active)	No specific timing required.
Fox	Trapping Spotlight counts Track counts Cameras	Shooting Trapping Baiting	No specific timing required

7.9.3. Weed hygiene protocols

To ensure that new weeds that may impact MNES are not brought to site by Project activities, weed hygiene protocols will be adopted for the duration of the approval. These hygiene protocols have been developed to reduce the likelihood that weeds are introduced through the transportation of plant and machinery to the Project and include:

- Vehicle wash-downs will be undertaken in accordance with clean-down procedures, guidelines and checklist detailed by Biosecurity Queensland, in particular the Vehicle and Machinery Checklists – Clean-down procedures (Biosecurity Queensland, 2014).

- Washdown all light vehicles prior to entry of the Project area.
- Washdown all heavy vehicles/machinery prior to entry of the Project area.

Table 7-7 Vehicle Washdown and Hygiene Procedures

Procedure	Description
Pre-washdown	1. Position vehicle/equipment safely and ensure stability (i.e. brakes applied); 2. Remove excessive debris (i.e. mud, branches) for appropriate disposal using a dry cleaning method before wet (e.g. scrape off mud before pressure hose applied); and 3. Detach removable items or parts and decontaminate individually (where required).
Decontamination of external surfaces	1. Start top-down of vehicle or equipment; 2. Wet decontamination procedure: apply disinfectant/detergent and leave for appropriate contact time (usually 10 minutes) then rinse with clean water; and 3. If other techniques e.g. heat, fumigation for tools, equipment and other things are required, ensure exposure requirements are met as required by disease/pest guidelines.
Decontamination of internal surfaces	1. Only necessary if internal surfaces are exposed to potential contamination; 2. Protective covers (i.e. seat covers, dash covers) will be removed and cleaned or appropriately disposed of; 3. Remove solid materials with a vacuum, cloth or brush; 4. Air filters will be removed, replaced and cleaned (technician may be required); and 5. Surfaces can be wiped or sprayed with 70% alcohol or another appropriate disinfectant.

7.10. Bushfire management

As the Project is largely linear infrastructure, conventional approaches to control potential bushfires such as fire breaks and controlled burns are not practical. As such, the key approach to bushfire management is to minimise the potential risk of starting bushfires from Project activities and to avoid spread of fire from the action from entering into the Clarke-Connors Ranges.

Potential ignition of fires will be minimised through the implementation of a hot works permit process that will be required for any activities that may create sparks such as welding.

In addition to the hot works permit process, an emergency response plan to deal with bushfires entering the Project Site will be developed in consultation with the landholders and the Queensland Rural Fire Service.

A Bushfire Management Plan (BMP) will be developed for the Project that will contain all bushfire management and mitigation measures within the footprint including:

- Implementation of the BMP that addresses matters required by the SPP State interest for natural hazards with the following mitigation strategies:
 - An Asset Protection Zone around infrastructure
 - Mowing and slashing to reduce fuel around buildings
 - Access tracks to be kept as fire breaks and defensible spaces
 - Smoke detectors and fire-fighting equipment such as fire extinguishers to be kept in permanent buildings and temporary site offices
 - Project vehicles to contain fire extinguishers and CB radios
 - A water supply tank suitable for firefighting to be maintained near buildings

- Access tracks and layout designed and to be maintained to allow sufficient emergency service access for the purposes of firefighting.
- Reinstatement of any existing fire breaks within the Project site, if they are damaged during construction.
- Ensuring that any new buildings meet the specifications and requirements of AS 3959-2018, where applicable.
- Providing suitable ingress and egress to the Project site and escape routes.
- Preparing and implementing an Emergency Response Plan (ERP) for the construction phase of the Project in consultation with local emergency management and disaster management groups.

7.11. Rehabilitation of temporary clearance areas

All temporary clearance areas (areas not required for ongoing operation of the Project) will be rehabilitated. Rehabilitation will be undertaken progressively, commencing as soon as temporary clearance areas are no longer required for construction. All areas will be stabilised using native species to minimise potential erosion and sediment risks (as outlined in Section 7.13). Rehabilitation will be undertaken following methods from *Revegetation Techniques: A Guide for establishing native vegetation in Victoria* (Greening Australia 2003)

as outlined in Table 7-8.

Table 7-8 Rehabilitation methods, effectiveness and timing

Technique	Effectiveness	Timing
Direct seeding with soil wetting agents or spray mulches	Beneficial for seed establishment in low rainfall areas and reduces erosion.	- As soon as the site has been prepared. - Sow in Spring in areas with medium-high rainfall.
Hydro-mulching or hydro-seeding	- Method for quick vegetation establishment and for hard to access areas. - Hydro-mulching provides initial surface erosion control. - Hydro-seeding (plus mulch) reduces the impact of rain and provides a longer period of erosion control	As soon as the site has been prepared.
Aerial seeding	Can cover large areas in short amount of time and access areas where machinery cannot.	- As soon as the site has been prepared. - Sow in Spring or when soil moisture is elevated following rainfall.
Direct seeding by hand which includes: - Broadcast sowing; - Spot sowing; and - Niche seeding.	Suitable for areas where machinery cannot access.	- As soon as the site has been prepared. - Sow in Spring or when soil moisture is elevated following rainfall.

Technique	Effectiveness	Timing
Mechanical planting	• Good for large-scale revegetation in flat to undulating areas. • Planting rates of 500-1000 plants per hour.	• As soon as the site has been prepared. • Sow in Spring or when soil moisture is elevated following rainfall.

Within six months rehabilitated areas will have 70% of the groundcover relative to equivalent undisturbed sites. Where this level of groundcover has not been achieved within six months, additional rehabilitation activities will be undertaken to facilitate growth of additional cover and include additional hydro-mulching and hydro-seeding.

7.12. Speed limits

Potential impacts from vehicle strike are recognised as a potential threat to MNES. Vehicles within the Disturbance Footprint will be restricted to 60km/hr in all areas mapped as either Koala habitat or Squatter Pigeon breeding habitat with the exception of any State controlled roads. This speed limit has been assessed as appropriate to mitigate potential impacts from vehicle strike as per NSW Department of Environment and Heritage guidance on traffic threats to Koala (DEH 2024). This speed limit will be further reduced to 40km/hr outside of daylight hours as an additional precautionary measure to avoid and mitigate vehicle strikes. These speed limits will be implemented at all stages of the project for the duration of the approval.

7.13. Erosion and sediment control

Erosion is dependent on the likelihood and intensity of predicted and/or expected rainfall. As such, erosion control devices will be employed to limit soil erosion, and to protect the exposed areas of soil from raindrop impact erosion. Best practice land erosion control and site rehabilitation is largely dependent on the likelihood and timing of rainfall and wind events. Erosion and sediment control management plans for the Project will address principles set out in International Erosion Control Association (IECA) 2008 Best Practice Erosion and Sediment Control documents and incorporate the use of native flora species to achieve cover and stabilisation goals. The selection and implementation of appropriate erosion and sediment control measures to ensure potential downstream impacts are minimised is dependent on a number of factors including the anticipated disturbance duration, slope, soil characteristics and availability of materials etc. All erosion, sediment and drainage control measures listed in Table 7-9 will remain in place until construction works are completed and surfaces are stabilised and revegetated.

Table 7-9 Erosion, sediment control and water quality mitigation measures

Aspect	Environmental management measures
Erosion control	Minimise disturbance area. Vegetation and topsoil clearing will be staged relative to ground disturbing activities to minimise exposure of soils. Exposed soil (including topsoil stockpiles) will be stabilised with appropriate cover material after earthworks.

Aspect	Environmental management measures
Sediment control	Appropriate sediment controls, based on the estimated annual soil loss at each work area, will be implemented during construction activities. Dust suppression measures will be employed and include the use of water tankers and soil binder to suppress dust. On-site stockpiles will be located outside of drainage lines and water-courses. Stockpiles will be stabilised and covered. Instream sediment controls will be implemented where access tracks cross flowing waterways.
Drainage control	Upslope clean water flows will be diverted around construction areas towards site discharge locations. Diversion drains will be constructed to direct on-site sediment-laden runoff towards appropriate sediment control devices as set out in IECA 2008 Best Practice Erosion and Sediment Control documents. Appropriate drainage controls will be placed on exposed surfaces to reduce velocities and minimise soil erosion.
Waste water	Construction waste water will be collected in holding tanks and trucked out from the Project Area.

8. RISK ASSESSMENT

A risk analysis following the Commonwealth's Environmental Management Plan Guidelines (DoE, 2014) has been undertaken to assess risks to environmental factors during the construction and operational phases of the Project. The risks have been designated as either low, medium, high or severe based on the likelihood and consequence matrix (Table 8-1).

Table 8-1 Risk matrix method for risk assessment

Measures						
Qualitative measure of likelihood		How likely is it that this event/circumstances will occur after management activities are implemented?				
Highly likely		Is expected to occur in most circumstances				
Likely		Will probably occur during the life of the project				
Possible		Might occur during the life of the project				
Unlikely		Could occur but considered unlikely or doubtful				
Rare		May occur in exceptional circumstances				
Qualitative measure of consequences		What will be the consequence/result if the issue does occur?				
Minor		Minor risk of failure to achieve plan objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions				
Moderate		Moderate risk of failure to achieve plan objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.				
High		High risk of failure to achieve plan objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.				
Major		Plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.				
Critical		Plan’s objectives are unable to be achieved, with no evidenced mitigation strategies.				
Risk Matrix						
Consequence						
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

8.1. Results of risk assessment

The risk assessment (Table 8-2) considers the risk that the Plan's environmental objectives will not be met. These objectives are presented in the table below and have been developed with reference to established management objectives for MNES within recovery plans, conservation advice and other guidelines.

If monitoring (refer Section 9.1) or opportunistic observations indicate that a risk has been realised, a contingency response will identify appropriate and tailored corrective actions to rectify the specific event or circumstance.

Outcomes will be communicated to relevant personnel (i.e. through ongoing training opportunities; Section 10.2). Risks and the suggested contingency response are provided in (Table 8-2).

Table 8-2 Risk assessment

Environmental objective	Risk event or circumstance	Management actions ⁷	Residual risk			Trigger detection/monitoring activity ⁸	Contingency response and corrective action
			L	C	R		
To protect MNES	Removal of habitat	Pre-clearing: - Pre-clearance surveys to identify threatened species, including active nests, Greater Glider hollows, Koala presence and large trees within Greater Glider habitat. - Micro-siting infrastructure (i.e. underground cable alignment) to minimise direct impacts to active nests, hollows and other habitat features in use by a threatened species. - Provide short-medium term alternative habitat (nest boxes) for Greater Glider, where active HBTs are to be removed. - Relocation of all potential Greater Glider hollows to suitable Greater Glider habitat, with supplementary nest boxes for any potential Greater Glider hollows lost during salvage at a rate of 4:1	Possible	High	Medium	Threatened species found within clearing impact area. Pre-clearance surveys	Relocation of potential Greater Glider hollows (with supplementary nest box installation) and installation of glider poles with both monitored to assess usage.
	Injury or death during vegetation clearing	During clearing: - Use sensitive clearing techniques Section 7.3. This will include tapping HBTs to encourage self-relocation, and slowly lowering the trees down to the ground prior to inspection by fauna spotter. - Order stop works if threatened fauna is found within clearing area.	Possible	High	Low	Animal observed during clearing. Pre-clearance surveys/fauna spotter observation during clearing.	Injured fauna transported to a wildlife carer. If a threatened species, report as per Section 9. Review risk, fauna spotter catcher to assess whether clearing approach could be improved.

⁷ Management actions detailed in Section 4.1

⁸ Monitoring detailed in Section 9

Environmental objective	Risk event or circumstance	Management actions ¹	Residual risk			Trigger detection/monitoring activity	Contingency response and corrective action
			L	C	R		
	Injury or death from vehicle strike	- Educate on-site staff - Strict enforcement of speed limits at all times.	Rare	Medium	Low	Injuries or death of threatened species are an environmental incident and must be reported to the Site Environmental Coordinator	Review risk, amend speed limit, install signage and/or conduct additional staff training.
	Disruption to life-cycles	Pre-clearing: - Educate on-site staff of life-cycle timeframes for the applicable MNES species - Pre-clearance surveys to identify threatened species, including active Squatter Pigeon nests, Greater Glider hollows, Koala presence and large trees within Greater Glider habitat. During clearing: - Use sensitive clearing techniques 7.3. This will include tapping HBTs to encourage self-relocation, and slowly lowering the trees down to the ground prior to inspection by fauna spotter. - Order stop works if threatened fauna is found within clearing area or if breeding activity or nests are observed within the clearing area.	Possible	High	Low	Threatened species, nest, potential Greater Glider Hollow or breeding activity found within clearing impact area. Animal, hollow or nest observed during clearing.	Where breeding activity or nests of MNES species are discovered, cease or delay clearing and construction activity in the particular area until activity has concluded. Injured fauna transported to a wildlife carer. If a threatened species, report as per Section 9. Review risk, fauna spotter catcher to assess whether clearing approach could be improved.
General biodiversity (applies to EPBC threatened species and communities)							
Successful rehabilitation of disturbed ground	Disturbed ground not rehabilitated, or rehabilitation fails, resulting in increased erosion	Pre, during and post clearing: - Erosion and sediment control - Progressively rehabilitate disturbed ground	Possible	High	Medium	Target of 70% groundcover compared with reference sites not met.	Corrective action to be appropriate to local environmental conditions
Bushfire risk will not increase as a result of the Project.	Bushfire caused by Project activities	Contact fire authorities on 000 if an uncontrolled fire is seen on site. Implement: Hot work permit system	Rare	High	Medium	Bushfire or near miss	Investigate the and review risk. May necessitate additional controls or staff training.

Environmental objective	Risk event or circumstance	Management actions ¹	Residual risk			Trigger detection/ monitoring activity	Contingency response and corrective action
			L	C	R		
		Specific mitigation measures relating to vehicle use, smoking, and use of flammable materials.					
	Project unprepared for bushfire	Contact fire authorities on 000 if an uncontrolled fire is seen on site. - Established separation distances (buffer) between infrastructure and threat (vegetation). - Maintaining asset protection zones. - Mowing and slashing. - Fire-fighting equipment and water on hand. - Emergency service access clear.	Unlikely	High	High		Corrective action may require: Inspect and repair/clear fire breaks and widen if necessary
Pest animal activity will not increase as a result of the Project.	Pest animals attracted to the Project Site, i.e. by increased food resources	Conduct pest animal management measures in accordance with Section 7.9.	Unlikely	Medium	Low	Sightings of feral species (direct sighting or evidence of presence)	Specific control measures and engagement of suitably qualified person to undertake if required, additional staff training, review of attractants (i.e. unsecured bins with food waste).
No new restricted weed species introduced as a result of the Project.	Weeds are spread by Project plant or equipment.	Conduct weed control measures in accordance with the Section 7.9. All vehicles, plant and any machinery coming to site to possess a current weed and seed free certification.	Possible	Medium	Medium	New weed species observed, or weeds in a new location.	Weed control, reviewed weed hygiene practices. Adapt weed treatments with the advice of the weed management contractor. Upon being notified or becoming aware of new weed infestation relevant Contractor is to implement weed control measures within one month.

Environmental objective	Risk event or circumstance	Management actions ¹	Residual risk			Trigger detection/ monitoring activity	Contingency response and corrective action
			L	C	R		
No new outbreaks of restricted weeds within the Project Site.	Weed seeds introduced through mulch, topsoil or other material brought to site.	Imported materials such as sand, gravel and sediment controls materials will be sourced from sites which have been declared free of noxious weeds or Phytophthora infection by a suitably qualified person (included in glossary).	Unlikely	Medium	Low		

9. MONITORING AND REPORTING

9.1. Monitoring

Monitoring will be undertaken to observe and report on the performance of proposed mitigation and management measures and performance indicators, with a focus on demonstrating:

- 'Early-control' (that management actions are effective) and 'early warning' (corrective actions are required) functions, with respect to the performance targets
- Early intervention and remediation of potential or realised non-conformances. Non-conformances include failure to achieve the Plan objectives as measured by the Plan's performance targets and management triggers. The monitoring program will inform adaptive implementation and demonstrate whether the management objectives for protected matters have been, or are likely, to be met.

Suitably qualified personnel will design and conduct monitoring and survey activities and analyse monitoring results. Table 9-1 provides a summary of monitoring and corrective actions to be undertaken to achieve performance indicators.

Table 9-1 Monitoring Actions

Performance Criteria	Methods	Monitoring	Trigger for Corrective Action	Corrective Action	Timing	Interim Milestones
Clearing of MNES habitats does not occur outside of the approved disturbance area	Clearing is to be undertaken as per methods in Section 7.3 and Section 7.4;	Check delineation of boundaries and sign off prior to clearing commencing. Review disturbance areas monthly during construction to check clearing and construction areas have not exceeded approved areas for disturbance.	Clearing of MNES species habitat exceeds the approved disturbance limits. Evidence of disturbance to areas outside of approved limits.	Clearing works to cease immediately and report excess cleared areas to DCCEEW. Rehabilitation of disturbance areas outside of the final footprint.	Undertake review of process associated with management of clearing footprint and communication to clearing personnel within 2 weeks of identification of clearing outside approved footprint.	Annual reporting required under the EPBC approval documents clearing undertaken against disturbance limits
Areas of MNES habitats and/or mature, large trees, hollow-bearing trees or large stags as potential nesting and roosting habitat retained	Pre-clearance surveys assess habitat and trees for retention	Pre-clearance surveys identify areas or trees for retention in consultation with construction personnel	NA	NA	During construction	NA
Prevent the introduction and/or spread of declared weeds or pests	- Weed management procedure implemented. - See Table 7-1 for more detail on proposed mitigation measures.	Undertake 6 monthly inspections of Disturbance Footprint during construction to identify location of target weeds. Pre-clearance surveys include baseline weed and pest surveys.	Any increase in weed or pest abundance compared with baseline numbers established during pre-clearance surveys. New significant weed introduced to Disturbance Footprint.	Undertake review of this Plan current methods and improvements to be made. Depending on the cause, corrective actions to be applied include but are not limited to: - Weed protocol retraining for all staff, increased weed hygiene; - Increase or change methods for weed and pest management.	From the investigation, corrective actions will be developed by a suitably qualified person within 2 weeks of the trigger being detected. Identified corrective actions will be implemented within one month of corrective actions being agreed.	At the end of each Project stage monitoring will demonstrate weed abundance has been maintained or decreased across Development Footprint vs the pre-clearance survey baseline. 5 yearly interim reviews will summarise the results of weed monitoring and any corrective actions that have been implemented. The report will review effectiveness of those corrective actions.

Performance Criteria	Methods	Monitoring	Trigger for Corrective Action	Corrective Action	Timing	Interim Milestones
Targeted weed and pest management is undertaken within the Disturbance Footprint.	Weed and pest management undertaken in accordance with requirements set out in Section 7.9	Weed and pest management activities have been undertaken in accordance within timeframes committed	Weed and pest management activities have not been undertaken in accordance with commitments.	Undertake additional weed and pest management activities	New management activities undertaken within 3 months of identification	At the end of each Project stage monitoring will demonstrate weed and pest abundance has been maintained or decreased across Development Footprint vs the pre-clearance survey baseline. 5 yearly interim reviews will summarise the results of weed and pest monitoring and any corrective actions that have been implemented. The report will review effectiveness of those corrective actions.
All potential Greater Glider Hollows will be salvaged and installed within retained vegetation.	- Potential Greater Glider hollows recorded - Salvage and installation of potential Greater Glider hollows recorded	Record any potential Greater Glider hollow identified (as per Section 7.2). Record details of salvage and relocation of each potential Greater Glider hollow (as per Section 7.5).	>5% of potential Greater Glider hollows are lost during salvage	Where any potential Greater Glider hollows are lost during salvage, they are replaced with Greater Glider nest boxes. If salvage rate of Greater Glider hollows falls below 95%, a review and update to this Plan will be undertaken in accordance with the conditions of approval to include any additional measures which may be required to ensure the effectiveness of alternative measures, including demonstration that proposed measures are likely to successful based scientific research.	Install nest boxes within 1 week of need being identified. Update Plan following processes and timeframes outlined in the conditions of approval.	At the end of each stage of the project, Greater Glider hollow salvage rates will be reported.

Performance Criteria	Methods	Monitoring	Trigger for Corrective Action	Corrective Action	Timing	Interim Milestones
Relocated Greater Glider hollows, or nest boxes, for Greater Gliders show utilisation of at least 50%.	Hollows to be monitored to detect use by Greater Gliders.	Monitoring of Greater Glider hollows by quarterly survey including scat and scratch searches at base of trees containing salvaged hollows and nest boxes and spotlight searches of salvaged hollows and nest boxes. Monitoring results will be included in each annual compliance report for the project.	Greater Gliders utilisation of salvaged hollows and nest boxes <50%. Damage of the boxes, including pest animal occupancy in salvaged hollows.	Possible causes of disuse will be investigated. Additional time for monitoring may also be required as other programs have shown it can take many months for observations to be found. Undertake Greater Glider survey to determine presence in the area.	From the investigation, corrective actions will be developed by a suitably qualified ecologist within two weeks of the trigger being detected. Corrective actions will be implemented within 3 months following the corrective actions being agreed. If any salvaged hollows be damaged, they will be repaired within one month after the damage has been identified.	Greater Glider have been confirmed utilising salvaged hollows and nest boxes at least 50%. 5 yearly interim reviews will summarise the results of monitoring and any corrective actions that have been implemented. The report will review effectiveness of those corrective actions.
Maintain connectivity between areas of Greater Glider habitat areas within the Development Footprint. Glider pole utilisation target of 50%.	Installation of glider poles or fauna bridges as described in Section 7.3.2.	Monitor use of installed structure for use using cameras. Monitoring results will be included in each annual compliance report for the project.	Greater Gliders utilisation rate of <50%. Damage of the crossing structures.	Possible causes of disuse will be investigated. Additional time for monitoring may also be required. If rope crossings are not being utilised, assess potential to change the design for a new rope crossings or relocation. Undertake spotlighting surveys in adjacent habitat to confirm use by Greater Gliders.	From the investigation, corrective actions will be developed by a suitably qualified ecologist within two weeks of the trigger being detected. Corrective actions will be implemented within 3 months following the corrective actions being agreed. If any rope crossings be damaged, they will be repaired within three months after the damage has been identified.	Greater Glider have been confirmed utilising at least 50% of rope crossings and utilising glider poles. 5 yearly interim reviews will summarise the results of monitoring and any corrective actions that have been implemented. The report will review effectiveness of those corrective actions.

Performance Criteria	Methods	Monitoring	Trigger for Corrective Action	Corrective Action	Timing	Interim Milestones
No injury or mortality of MNES species as a result of construction activities	FSC present during clearing activities and implementing sensitive clearing techniques and that no roosting migratory species are present. Speed limits adhered to.	Records of clearing activities and FSC attendance. Speed checks undertaken as required.	FSC not present during clearing. Breach of speed limits	Review permit to disturb process and communication. Review approach to pre-clearance surveys and FSC use during clearing. Undertake speed limit awareness training	Within 1 week of incident	NA

9.1.1. Glider poles and relocated glider hollows monitoring – Greater Glider

Monitoring of Glider poles and relocated hollows will be conducted in accordance with the Conditions of Approval Attachment D (d):

- d. include a monitoring program to assess the utilisation of glider poles and salvaged hollows across the development footprint. The monitoring program must:
 - i. identify criteria for assessing Greater Glider use of glider poles and salvaged Greater Glider hollows;
 - ii. ensure that glider poles are installed correctly according to best practice information and can be used by Greater Gliders to cross fragmented Greater Glider habitat in the development footprint;
 - iii. detail the timing and frequency of monitoring; and
 - iv. detail site and other relevant characteristics for each glider pole in the development footprint and whether there was evidence of use by Greater Gliders to cross road clearings.

Monitoring of relocated and salvaged hollows will be assessed, as with pre-clear utilisation assessment, by identifying the criteria provided in the definition for Evidence of Greater Glider in the Conditions of Approval. This includes but is not limited to observing Greater Glider using the hollow, presence of scats within the hollow or around the tree, presence of Greater Glider fur within or around the Greater Glider hollow entrance.

This will be assessed using active survey searches of salvaged hollows and nest boxes, as well as other hollow bearing trees in the immediate surrounds on a quarterly basis for the first 24 months or until performance criteria have been achieved, then annually for the life of the approval.

Monitoring of glider poles utilisation will be conducted through placement of motion-triggered cameras. Cameras will be installed:

- At the top of each glider pole facing the top side of the cross-beam and the direction of travel (i.e. opposing side of the road)
- Oriented that any fauna species moving along the length of the beam or to the top of the pole, will trigger the passive infra- red sensor
- That each camera records 9-20 seconds of video footage, or takes a minimum of 5 still photographs

Data from each camera will be checked quarterly for the first 24 months following installation or until performance criteria have been achieved, then annually for the life of the approval.

9.2. Reporting

Environmental reporting requirements are summarised in Table 9-2. The table sets out the environmental reporting requirements applicable to the Project, timing of the reporting, who is responsible for managing preparation of the reports and the intended recipient(s).

Additional reporting may be necessary as the works progress. In such a circumstance, the Plan will be amended to reflect these changes. An amendment may be completed without submitting to DCCEEW for approval if the amendment would not be likely to have a new or increased impact. However, DCCEEW must be notified in this case and provided with:

- An electronic copy of the revised plan
- A marked up copy of revised plan with tracked changes from the approved version of the plan
- An explanation of the differences
- The reasons that it will not be likely to have a new or increased impact and written notice of the date on which the revised plan will be implemented with at least 20 days' notice of implementation.

Table 9-2 Reporting requirements.

No.	Report	Requirement	Timing	Responsibility	Recipient
1	Compliance Report.	Reporting as per EPBC 2020/8867 CoA 58.	Annual (within 60 business days following the relevant 12-month period.	Lotus Creek Wind Farm Pty Ltd.	Project website with notification to DCCEEW by email.
2	5 yearly interim milestone report	Report on actions undertaken in accordance with requirements of this Plan, any incidents, and updates to the Plan	Every 5 years from commencement of the action.	Lotus Creek Wind Farm Pty Ltd.	Project website with notification to DCCEEW by email.

Annual compliance reports will be published on the project website within 60 business days following the end of each 12-month period following the date of commencement of the action, in accordance with the relevant EPBC condition (CoA 58). In addition to publishing annual compliance reports, the following will be undertaken:

- The department will be notified by email that a compliance report has been published on the website and provide the weblink for the compliance report within 5 business days of the date of publication;
- All compliance reports will be made publicly available on the website until the approval for the action expires;
- Exclude or redact sensitive ecological data from compliance reports published on the website; and
- Where any sensitive ecological data has been excluded from the version published, submit the full compliance report to the department within 5 business days of publication.

To meet the requirements of CoA 15e, and to demonstrate compliance of the Plan, the annual compliance report will set out the following for the reporting period:

- Impact avoidance, mitigation and/or rehabilitation measures implemented
- The timing of implementation of the above measures, and an assessment of the effectiveness of those measures
- Management triggers detected and risks realised, contingency response/s and corrective actions implemented
- An evidence-based assessment of whether and to what extent the Plan is achieving the plan's objectives.

To meet the requirements of CoA 59 and 60, the details of any incident or non-compliance with the conditions or commitments made in plans will be reported to DCCEEW will be notified no later than two business days of becoming aware of the incident or non-compliance. In addition (as specified in CoA 60), details of the incident or non-compliance will be provided as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:

- Any corrective action or investigation which the LCWF has already taken or intends to take in the immediate future.
- The potential impacts of the incident or non-compliance.
- The method and timing of any remedial action that will be undertaken by LCWF.

10. COMPLIANCE

10.1. Compliance management

Compliance management, including non-conformity, corrective, and preventative actions, is summarised in relation to the Plan below.

Non-conformances may be identified through routine weekly site inspections, impromptu site inspections and general observations, via the Plan review or audit process, or be incident or complaint based. Any member of the Project team may raise a non-conformance or improvement opportunity.

The Plan and associated management-plans will be used as the reference to monitor and verify that environmental management objectives for threatened species are effectively implemented.

Environmental non-conformances might include:

- Failing to comply with the environmental regulations or license/permit conditions.
- Failure to implement commitments in the approved Plan or other environmental requirement.
- Carrying out work practices that have the potential to cause harm to threatened species.
- Activities that have caused actual harm to the environment not permitted by the project approvals or covered in the environmental assessment or management documentation.
- Deficiencies or concerns raised by client representatives and/or state and local authorities or agencies.

Upon detection, any of the above will trigger immediate steps to control the non-conformance and immediate reporting, investigation of the non-conformance and development of additional controls to prevent re-occurrence. A response will be developed in consultation with relevant stakeholders (e.g. DCCEE if triggered) and will be assigned to the appropriate personnel for close out.

Records will be kept of all corrective actions and follow-up processes to ensure close-out.

Environmental incidents will be recorded and reported in a number of ways:

- As identified during inspections, audits or routine observations.
- Recorded on the Environmental Incidents Register (and if required by Law, reported to the regulator).
- Communicated to workers during toolbox talks to share lessons learnt.

10.2. Training

Training for personnel on matters outlined in the Plan will be communicated through the following means as required:

- Environmental induction
- Toolbox talks, training and awareness
- Environmental awareness training
- Daily Pre-Start meetings.

10.3. Roles and responsibilities

All personnel undertaking Project activities are responsible for adhering to the management strategies outlined within this Plan, however, the following are accountable for its implementation:

- **Project Manager** for ensuring this Plan is implemented during Project clearing, construction, operation and decommissioning phases;

- **HSE Manager/Site Environmental Representative** for ensuring implementation of prescribed avoidance, mitigation and management strategies for each phase within this plan, and results of the review and ensure corrective actions are implemented in a timely and effective manner; and
- **Fauna spotter-catcher** to be present during the clearing phase and to ensure appropriate measures are implemented in accordance with Rehabilitation Permit requirements, and methodologies outlined in this Plan.

10.4. Audit and review

The project will be subject to ongoing auditing throughout construction and operation. The audits will be undertaken at regular intervals throughout construction (within 2 months of construction commencing and every 6 months thereafter) and operations (annually).

Specific to the Plan, audits will focus on:

- Compliance with environmental and planning conditions, including the application of the Plan. This will include (but is not limited to) those performance indicators listed in Table 9-1.
- Document control and review.
- Incident reporting and closure.

10.5. Decommissioning

At the end of the operational life of the Project Lotus Creek Wind Farm will decommission the Wind Farm. A decommissioning and rehabilitation MNES Management Plan will be created and provided to the department for Ministerial approval at least 6 months prior to the commencement of decommissioning activities.

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Appendix A – Suitably qualified ecologist CV

Appendix B – MNES Profiles

APPENDIX B MNES RELEVANT PROFILES

B.1 Threatened fauna species

B1.1 Koala

Koala – *Phascolarctos cinereus*



Photo: Jasmine Vink

Listing Status:

- **EPBC Act:** Endangered
- **NC Act:** Endangered

Description

Medium-sized marsupial, mostly grey fur, stocky body and large round ears.

Ecology

- Female Koalas able to produce one offspring each year. Births occur between October and May. Young are independent from 12 months old.
- Habitat: Occurs in Eucalypt woodlands and forests throughout eastern Australia and may prefer certain Eucalypt species within any local or regional area.
- Confirmed to occur at the site in north, central and southern areas.

Impacts

- A maximum of 341.26 ha of suitable habitat for Koala will require removal for the project. As this clearing is linear, there will be large tracts of retained habitat surrounding the clearing footprint for wildlife to disperse into.
- Potential project-related impacts include fragmentation of habitat, vehicle / plant strike and disease.
- Preparation of this Plan, including pre-clearance surveys, combined with mobile nature of species means that direct impacts during construction are unlikely.
- Fragmentation of habitat likely to be minor given narrow roads that will be used on a very infrequent basis. No concerns over ongoing operational impacts.

Management Approach

- The project's environmental objective is *to protect EPBC (and NC) Act threatened fauna species*.
- Management measures which will benefit Koala within the Site Boundary, and which have regard for conservation priorities suggested in DoEE (2012) and Natural Resource Management Ministerial Council (2009) include:
 - Mitigating the risk of vehicle strike by educating on-site contractors, and by enforcing strict speed limits (Section 6.8.1).
 - Koalas identified through pre-clearance surveys (Section 6.4.2) and avoided during clearing.
 - Bushfires can be a threat to the conservation of this species (through loss of habitat and direct mortality). Appropriate burning practices and other procedures to minimise fire threat at the Site Boundary include maintained separation distances between infrastructure and vegetation, commitment to mowing and slashing to reduce fuel load, fire-fighting equipment and water on site (Section 6.8.1).
 - Pest animal management which will reduce threat of predation (Appendix A).
 - Condition and extent of Koala habitat will be further enhanced through actions under the Lotus Creek Wind Farm Offset Area Management Plan

References

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- Natural Resource Management Ministerial Council (2009), *National Koala Conservation and Management Strategy 2009-2014*, report to the Department of the Environment, Water, Heritage and the Arts, Canberra.

B1.2 Greater Glider

Greater Glider – *Petauroides volans*



Photo: Eamon O'Meara

Listing Status:

- **EPBC Act:** Endangered
- **NC Act:** Endangered

Description

Largest gliding possum in Australia, with a head and body length of 35–46 cm and a non-prehensile furry tail measuring 45–60 cm. Has thick fur, colour is white or cream below and varies from dark grey, dusky brown through to light mottled grey and cream above. It has large furry ears and a short snout.

Ecology

- Diet mostly comprises eucalypt leaves and occasionally flowers.
- Females birth single offspring between March and June. Sexual maturity reached in

the second year.

- Occurs in open woodlands and open forests in eastern Australia. Shelters in large tree hollows during the day, active at night. Home ranges typically 1–4 ha with home ranges overlapping between individuals. Individuals will also share the same hollows at different times.
- Sensitive to forest clearance, logging and wildfire. Slow to recover after major disturbance due to their reliance on large hollows.
- Confirmed to occur on Site Boundary in north, central and southern areas in riparian vegetation.

Impacts

- A maximum of 45.2 ha of suitable habitat for Greater Glider will require removal for the project. As this clearing is linear, there will be large tracts of retained habitat surrounding the clearing footprint for wildlife to disperse into.
- Potential project-related impacts include habitat loss through clearing.
- Direct impacts during tree clearing are possible.
- Fragmentation of habitat likely to be minor given narrow roads that will be used on a very infrequent basis through suitable habitat.
- No concerns with regards to ongoing operational impacts.
- Preparation of this Plan, including pre-clearance surveys, combined with mobile nature of species means that direct impacts during construction are unlikely.

Management Approach

- The project's environmental objective is *to protect EPBC (and NC) Act threatened fauna species*.
- Management measures which will benefit Greater Glider within the Site Boundary, and which have regard for conservation priorities suggested in TSSC (2016) include:
 - Further avoidance of Greater Glider habitat through the detailed design stage, and micro-siting (Section 6.1.1).
 - Active hollows identified through pre-clearance surveys (Section 6.4.2).
 - Sensitive clearing techniques in Greater Glider habitat areas (Section 6.5.5).
 - Provision of alternative hollows (nest boxes) where HBTs showing signs of Greater Glider use are to be removed (Section 6.5.6), including ongoing monitoring (Section 7.1).
 - Bushfires are a threat to the conservation of this species (through loss of habitat and direct mortality). Appropriate burning practices and other procedures to minimise fire threat at the Site Boundary include maintained separation distances between

infrastructure and vegetation, commitment to mowing and slashing to reduce fuel load, fire-fighting equipment and water on site (Section 6.8.1).

- Condition and extent of Greater Glider habitat will be further enhanced through actions under the Lotus Creek Wind Farm Offset Area Management Plan.

References

- NGH Consulting *et al.* (2022), *Preliminary Documentation 2020/8867: Lotus Creek Wind Farm*, produced for Lotus Creek Wind Farm Pty. Ltd.
- DCCEEW, SPRAT Profile: *Petauroides D-Ilolans* – Greater Glider
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B1.3 Squatter Pigeon

Squatter Pigeon (Southern) – *Geophaps scripta scripta*



Photo: Eamon O'Meara

Listing Status:

- **EPBC Act:** Vulnerable
- **NC Act:** Vulnerable

Description

Medium sized (30 cm) ground dwelling pigeon. They have black and white stripes on face and throat, black beaks, dark-brown irises, and dull purple legs and feet. Blue-grey skin around the eye is a distinguishing feature of the southern subspecies.

Ecology

- **Breeding** habitat occurs on stony rises occurring on sandy or gravelly soils, within 1 km of a suitable, permanent waterbody.

- Ground covering vegetation layer in foraging and breeding habitat is considerably patchy consisting of native, perennial tussock grasses or a mix of perennial tussock grasses and low shrubs or forbs.
- In QLD, foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills and lateritic (duplex) soils on low 'jump-ups' and escarpments.
- Occurs mostly in grassy woodlands and open forests dominated by eucalypts, usually with ready access to water.
- Habitat occurs on Site Boundary in north-eastern and central sections.

During site surveys, Squatter Pigeon were observed in proximity to water bodies throughout Site Boundary. Population is low throughout the site; higher populations occur outside the Site Boundary.

Impacts

- A maximum of 16.39 ha of suitable breeding habitat and 32.35 ha of foraging habitat for Squatter Pigeon will be impacted by the Project. As this clearing is linear, there will be large tracts of retained habitat surrounding the clearing for wildlife to disperse into.
- Project noise and vibration has the potential to disturb nesting individuals, though no nests were found during site surveys.
- Species at low risk of mid-flight collision with turbines.
- This species occurs primarily along more open woodland and grasslands in the lower-lying areas. Unlikely to be impacted by operations, although some chance of minor impact during construction
- Ecological assessment determined the project would have low impact on Squatter Pigeons, particularly when incorporating mitigation measures.
- Preparation of this Plan, including pre-clearance surveys, combined with mobile nature of species means that direct impacts during construction are unlikely.

Management Approach

- The project's environmental objective is *to protect EPBC (and NC) Act threatened fauna species*.
- Management measures which will benefit Squatter Pigeon within the Site Boundary, and which have regard for conservation priorities suggested in TSSC (2015) include:
 - Further avoidance of Squatter Pigeon habitat through the detailed design stage, and micro-siting (Section 6.1.1).

- Nests identified through pre-clearance surveys (Section 6.4.2).
- Habitat enhanced and increased through the offset provided for Greater Glider (Lotus Creek Wind Farm Offset Area Management Plan).

References

- DCCEEW, SPRAT Profile: *Squatter Pigeon (Southern)*
http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440
- Marine and Freshwater Species Conservation (2015). Consultation Documentation on Listing Eligibility and Conservation Actions, *Geophaps scripta scripta* (squatter pigeon (southern)).
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B.2 Migratory birds

B2.1 White-throated Needletail

White-throated Needletail – *Hirundapus caudacutus*



Photograph by Roland Speck, distributed under a CC BY 2.0 license

Listing Status:

- **EPBC Act:** Vulnerable, Migratory and Marine
- **NC Act:** Vulnerable

Description

- The White-throated Needletail is a large (20 cm in length and approximately 115–120 g in weight) swift with a thickset, cigar-shaped body, stubby tail and long pointed wings.
 - Breeding does not occur in Australia
- In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1,000 m above the ground (Coventry 1989; Tarburton 1993). Because of this, conventional habitat descriptions are inapplicable (Cramp, 1985).
- It forages over a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats (Tarburton 1993; Templeton 1991),
- Migratory aerial species, found in Australian Eastern states and Territories.
 - Recorded at the Site in the northern and central areas.

Impacts

- Potential impacts include rotor strike and avoidance of the area.
- Less than 5% of the habitat within the study area will be removed with large tracts of habitat available in the surrounding area. No high use flight paths are known or were identified during the site survey. No breeding areas or ecologically significant areas were identified within the project footprint. Given the above, it is unlikely that the project will have a significant impact on this species.

Management Approach

- The project environmental objective is *to protect EPBC (and NC) Act threatened bird and bat species*.
- Management measures which will assist to protect White-throated Needletail include (management, including monitoring and mitigation measures are detailed in the separate Lotus Creek Wind Farm Bird and Bat Management Plan):
 - Operational monitoring and analysis, including carcass searches, to enable detection of any mortality (an impact trigger, which enacts a decision-making framework to determine appropriate mitigation).

References

- Coventry, P. (1989). *Comments on airborne sightings of White-throated Needletails Hirundapus caudacutus*. Australian Bird Watcher. 13:36-37.
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B2.2 Rufous Fantail

Rufous Fantail – *Rhipidura rufifrons*



Photograph by Greg B Miles, distributed under a CC BY-SA 2.0 license

Listing Status:

- **EPBC Act:** Migratory and Marine
- **NC Act:** Special Least Concern

Description

- Rufous Fantails are medium sized birds (15cm) with an orange-reddish-brown back, rump and base of tail. They have a black and white breast that grades into a white colour on the chin and throat (Higgins et al, 1999).
- The Rufous Fantail inhabits moist and moderately dense habitats. Within these areas, it has large variations in habitat requirements. They can be found in Eucalyptus forests, mangroves, rainforests and woodlands (usually near a river or a

swamp).

- Rufous Fantails will generally occupy the lower levels of their habitat, the understorey or the subcanopy, straying no further than 6m from the ground.
- Rufous fantails were recorded in the northern, central and southern portions of the site.

Impacts

- Potential impacts include rotor strike and avoidance of the area.
- Less than 5% of the habitat within the study area will be removed with large tracts of habitat available in the surrounding area. No high use flight paths are known or were identified during the site survey. No breeding areas or ecologically significant areas were identified within the project footprint. Given the above, it is unlikely that the project will have a significant impact on this species.

Management Approach

- The project's environmental objective is *to protect EPBC (and NC) Act threatened bird and bat species*.
- Management measures which will assist to protect Rufous Fantail include (management, including monitoring and mitigation measures are detailed in the separate Lotus Creek Wind Farm Bird and Bat Management Plan):
 - Project design has minimised clearing along waterways (suitable habitat for this species).
 - Operational monitoring and analysis, including carcass searches, to enable detection of any mortality (an impact trigger, which enacts a decision-making framework to determine appropriate mitigation).

References:

- Fry, C.H. (1984). The Bee-eaters. In: Book. Poyser, Calton, England.
- Higgins, P.J. (ed.) (1999). *Handbook of Australian, New Zealand and Antarctic Birds*. Volume Four – Parrots to Dollarbird. Melbourne: Oxford University Press.
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B2.3 Satin Flycatcher

Satin Flycatcher – *Myiagra cyanoleuca*



Photograph by Aviceda at English Wikipedia, distributed under a [CC BY 3.0](https://creativecommons.org/licenses/by/3.0/) license

Listing Status:

- **EPBC Act:** Migratory and Marine
- **NC Act:** Special Least Concern

Description

- The Satin Flycatcher is a small blue-black and white bird with a small crest. Male Satin Flycatchers have a glossy blue-black head, breast and upperparts that give the species its name. Females have prominent brownish orange feathers on the throat and chin.
- **Ecology:** The Satin Flycatcher is a very active, mobile bird that is almost never still. They dart from branch to branch or make ~~dashing flights to catch insects. Even when they land on a branch they are continually~~

on the move, wagging the tail from side to side or quivering it up and down (Birdlife Australia 2019).

- **Breeding:** Satin Flycatchers prefer to nest in a fork of outer branches of trees, such as paperbarks, eucalypts, and banksias. They nest in the same locality each year, and sometimes in the same tree (BA NRS 2002)
- **Habitat:** Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests (Emison *et al.* 1987).
- Satin flycatchers were recorded in the northern, central and southern portions of the site.

Impacts

- Potential impacts include rotor strike and avoidance of the area.
- Less than 5% of the habitat within the study area will be removed with large tracts of habitat available in the surrounding area.
- No high use flight paths are known or were identified during the site survey. No breeding areas or ecologically significant areas were identified within the project footprint.
- Given the above, it is unlikely that the project will have a significant impact on this species.

Management Approach

- The project's environmental objective is *to protect EPBC Act threatened bird and bat species*.
- Management measures which will assist to protect the Satin Flycatcher include (management, including monitoring and mitigation measures are detailed in the separate Lotus Creek Wind Farm Bird and Bat Management Plan):
 - Operational monitoring and analysis, including carcass searches, to enable detection of any mortality (an impact trigger, which enacts a decision-making framework to determine appropriate mitigation).

References

- NGH (2022), *Preliminary Documentation 2020/8867: Lotus Creek Wind Farm*, produced for Lotus Creek Wind Farm Pty. Ltd.
- Birdlife Australia, [Website, accessed 12/4/2019] Satin Flycatcher
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