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## Wambo Wind Farm

Offset Area Management Plan

04 April 2023

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## Signature Page

04 April 2023

# Wambo Wind Farm

## Offset Area Management Plan



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## Acronyms and Abbreviations

Name	Description
DAWE	Department of Water and Environment
DoE	Department of the Environment
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i>
ERM	Environmental Resources Management Australia Pty Ltd
MNES	Matter of National Environmental Significance
MHQA	Modified Habitat Quality Assessment
OAMP	Offset Area Management Plan
PD	Wambo Wind Farm EPBC Act Preliminary Documentation
PMAV	Property Map of Assessable Vegetation
Proponent	White Wind Project No.1 Pty Ltd
SAT	Spot Assessment Technique
SEVT	Semi-evergreen Vine Thicket
Project Area	The area defined as the Wambo Wind Farm project extent, as depicted in Figure 1-1
RE	Regional Ecosystems
REDD	Regional Ecosystem Description Database
TEC	Threatened Ecological Communities
VM Act	<i>Vegetation Management Act 1999</i>
WONS	Weeds of National Significance

# 1. INTRODUCTION AND OFFSET PRINCIPLES

## 1.1 Background

White Wind Project No.1 Pty Ltd (the Proponent) proposes to construct and operate a large-scale wind farm, located approximately 15 km north-east of Jandowae, in the Western Downs region of Queensland. The Wambo Wind Farm (the Project) will include up to 110 wind turbines, together with associated roads and electrical infrastructure to facilitate connection to the electricity grid. The Project Area, and the context of its locality, is shown in Figure 1-1. The Project has been designed to allow construction to be undertaken as a single project, in two discrete stages. It is anticipated that construction of Stage 1 will commence in Q4 2022, with Stage 2 to commence 12 months later in Q4 2023. Based on this indicative schedule, construction will be completed in Q1 2025.

Environmental Resources Management Australia Pty Ltd (ERM) was commissioned by the Proponent to undertake the environmental studies to inform the Project design and regulatory approval requirements, including seeking approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Detailed ecological field investigations were undertaken across four separate field campaigns in November 2019, December 2020, January 2021 and February 2021. Outcomes of the field investigations are documented in the Wambo Wind Farm Ecological Assessment Report (ERM, 2021a).

The proposed action was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) on 31<sup>st</sup> of July 2020 (EPBC Reference 2020/8727). Following requests for additional information on 26<sup>th</sup> of August 2020 and the 19<sup>th</sup> October 2020 and subsequent discussions with the Proponent, the Project was determined to be a 'Controlled Action' on 17<sup>th</sup> of January 2021 due to the Project's impacts on the koala and greater glider (both Matters of National Environmental Significance; MNES) to be assessed by submission of the Wambo Wind Farm EPBC Act Preliminary Documentation (PD) (ERM, 2021b).

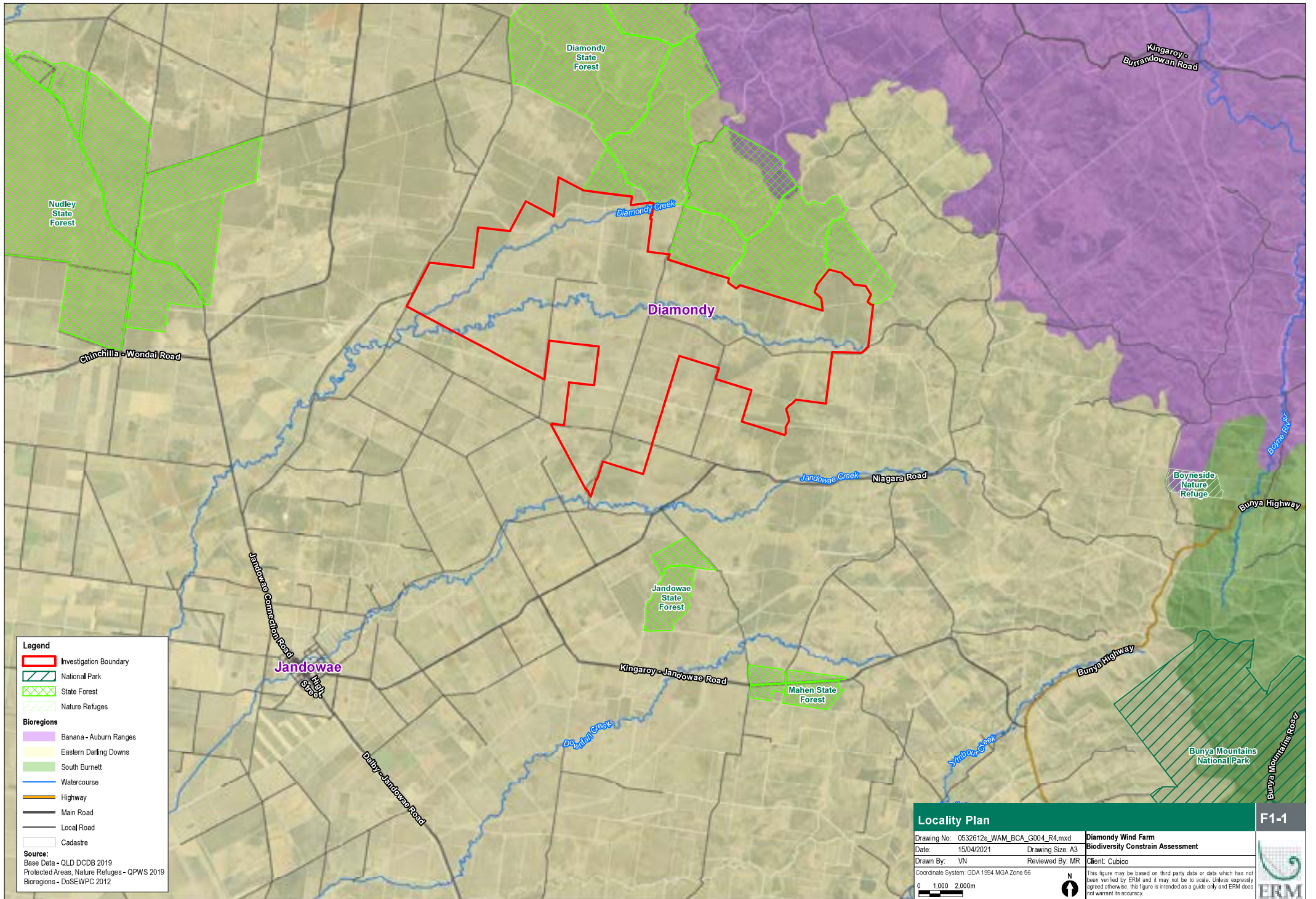
The detailed response to the PD (ERM, 2021b) request has been prepared by the Proponent and submitted to DAWE, with approval to publish the response for public comment received on 4 August 2021. Section 6 of the PD (ERM, 2021b) response outlines the strategy to deliver the required offsets for significant residual impacts to the koala and greater glider as a result of the Project.

Approval for the Project was received from DAWE on 21 December 2021, with Condition 5 of the decision notice requiring the following:

*To compensate for the clearing of up to 30 hectares of Koala habitat and/or Greater Glider habitat, the approval holder must submit an Offset Area Management Plan for approval by the Minister. The approval holder must not commence the action until the Offset Area Management Plan has been approved by the Minister in writing. The approval holder must implement the Offset Area Management Plan approved by the Minister.*

Condition 6 of the decision notice also provides additional detail on the contents and structure of the OAMP to be submitted to DAWE for approval. This OAMP addresses these requirements, with a summary of where each element is included provided in Section 1.2 and Table 1.1.

This Offset Area Management Plan (OAMP) has been prepared, in accordance with the EPBC Act Environmental Offsets Policy and Condition 5 and 6 of the decision notice, to set out the management actions to be implemented on the Offset Area, as well as establishing the environmental objectives, ecological outcomes, maintenance and monitoring requirements relevant to delivering the required offsets.



**Legend**

- Investigation Boundary
- National Park
- State Forest
- Nature Refuges

**Bioregions**

- Banana - Auburn Ranges
- Eastern Darling Downs
- South Burnett
- Watercourse
- Highway
- Main Road
- Local Road
- Cadastre

**Source:**  
 Base Data - QLD DCDB 2019  
 Protected Areas, Nature Refuges - QPWS 2019  
 Bioregions - DoSEWPC 2012

Locality Plan		F1-1
Drawing No: 0532612s_WAM_BCA_G004_R4.mxd	Date: 15/04/2021	<b>Diamondy Wind Farm          Biodiversity Constrain Assessment</b>  Drawn By: VN      Reviewed By: MR Client: Cubico  <small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>
Drawing Size: A3	Reviewed By: MR	
Coordinate System: GDA 1994 MGA Zone 56		
0 1,000 2,000m		

## 1.2 Purpose

Due to the residual impacts on MNES, specifically the removal of 30 ha habitat for koala and greater glider, the Proponent will be required to deliver an environmental offset in accordance with the EPBC Act decision notice This OAMP has been prepared to meet this requirement.

This OAMP demonstrates how the Proponent will meet the requirements of the approval conditions and provide an environmental offset consistent under the *EPBC Act Environmental Offsets Policy* (the EPBC Offsets Policy) (DSEWPC, 2012). This offset is relevant to the compensation of the proposed significant impact for the removal of up to 30 ha of koala and greater glider habitat.

The Proponent has committed to land-based offsets with legal security for the long-term protection of vegetation on the identified property.

The requirements of conditions 5 and 6 of the approved EPBC Referral are outlined in Table 1.1 with the relevant sections of this OAMP that address them.

**Table 1.1 EPBC Referral Conditions relevant to the OAMP**

Item	OAMP conditions of EPBC Referral 2020/8727	Relevant OAMP section
5	To compensate for the clearing of up to 30 hectares of Koala habitat and/or Greater Glider habitat, the approval holder must submit an Offset Area Management Plan for approval by the Minister. The approval holder must not commence the action until the Offset Area Management Plan has been approved by the Minister in writing. The approval holder must implement the Offset Area Management Plan approved by the Minister.	This OAMP is the relevant OAMP for EPBC Referral 2020/8727 submitted to the Minister for approval that is to be commenced and implemented once approved.
6	The Offset Area Management Plan/s must:	
6(a)	identify a suitable environmental offset(s) for the impacts on Koala habitat and Greater Glider habitat that satisfies the requirements of the Environmental Offsets Policy;	The Offset Area is described in <b>Section 4.1</b> Further detail is provided in <b>Section 4</b> and compliance with the EPBC Offsets Policy outlined in <b>Table 4-1</b>
6(b)	include summary information on the residual impacts to Koala habitat and Greater Glider habitat that will be compensated for by the offset(s). This summary must include the area(s) of habitat for the Koala and Greater Glider and its condition and quality at all impact sites which the particular offset(s) are to address;	Summary information on the residual impacts and the impact site is outlined in <b>Section 3</b> for both the target species.
6(c)	include detailed baseline habitat quality information on the proposed offset(s);	Baseline habitat quality information for the proposed Offset Area and the target species was undertaken through the Modified Habitat Quality Assessment (MHQA) method. These MHQAs have been provided to the department with the submission of this OAMP.
6(d)	commit to achievable ecological outcomes for the proposed offset(s) that meet the requirements of the Environmental Offsets Policy;	Ecological outcomes for the proposed offsets are provided in <b>Section 4.3</b> and compliance with the EPBC Offsets Policy outlined in <b>Table 4-1</b> Relevant to <b>Section 4.2</b> – the term management actions refers to the ecological outcomes the OAMP aims to achieve.
6(e)	detail how the offset(s) will be legally secured;	The Offset Area will be legally secured as outlined in <b>Section 7</b>



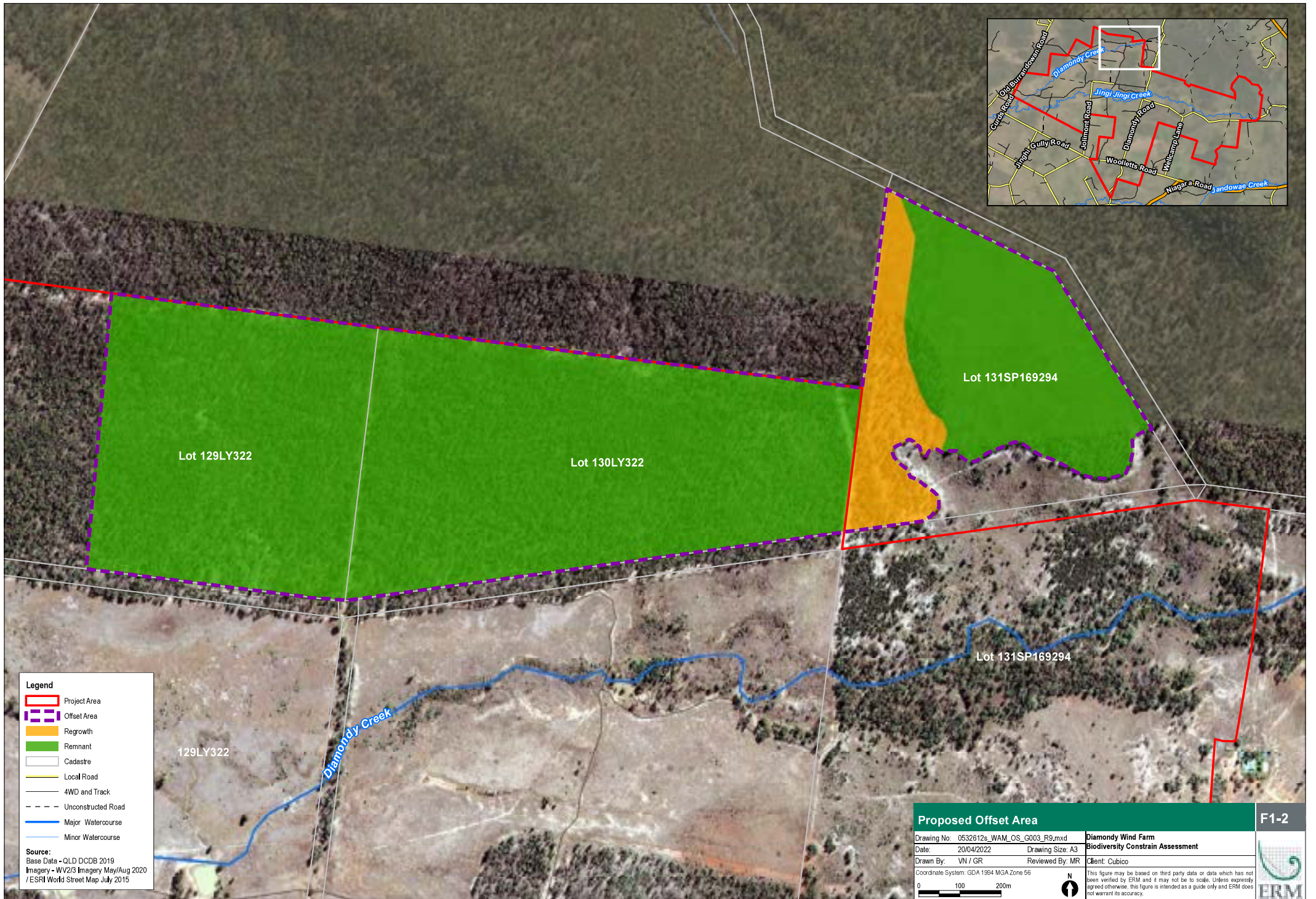
Item	OAMP conditions of EPBC Referral 2020/8727	Relevant OAMP section
6(f)	include a reference to the EPBC Act approval conditions to which the Offset Area Management Plan refers;	<b>Section 1.2</b> and <b>Table 1.1</b> outline the relevance to the EPBC Referral conditions (Conditions 5 & 6).
6(g)	include a table of commitments made in the Offset Area Management Plan to achieve the ecological outcomes, and a reference to where the commitments are detailed in the Offset Area Management Plan;	Management actions, environmental objectives, completion criteria, corrective actions and monitoring are outlined in <b>Section 4</b> Relevant to <b>Section 4.2</b> – the term management actions refers to the ecological outcomes the OAMP is outlining to achieve. A table of commitments is provided in <b>Appendix B</b> . The table of commitments reflects the environmental objectives, ecological outcomes, monitoring actions and surveys, corrective actions, reporting annual compliance and OAMP review, and legal requirements and duty of care.
6(h)	include reporting and review mechanisms, and documentation standards to demonstrate compliance with management and environmental commitments in the Offset Area Management Plan;	Reporting and review mechanisms are outlined in <b>Section 5.2</b>
6(i)	include an assessment of risks to achieving environmental objectives and risk management strategies that will be applied;	Management Actions are outlined in <b>Section 4.2</b> Environmental objectives and completion criteria are outlined in <b>Section 4.3</b> Risk analysis is provided in <b>Section 6</b>
6(j)	include impact avoidance, mitigation and/or repair measures, and their timing;	<b>Section 3</b> outlines the micro-siting processes that will occur in order to avoid and minimise impacts to the target species of the OAMP
6(k)	include a monitoring program, which must include: i. measurable performance indicators to monitor attainment of the ecological outcomes; ii. trigger values for corrective actions; and iii. the timing and frequency of monitoring to detect trigger values and changes in the performance indicators.	The proposed monitoring program is outlined in <b>Section 5.1</b> .
6(l)	include proposed corrective actions, if trigger values are reached or performance indicators not attained; and	Corrective actions are outlined in <b>Section 4.4</b> and are provided for in further detail in <b>Table 4-4</b> and <b>Section 6</b>

Item	OAMP conditions of EPBC Referral 2020/8727	Relevant OAMP section
6(m)	include links to referenced plans and applicable conditions of approval (including State approval conditions), if any.	<p>State approval received for the Project outlined the following condition for Environmental Offsets relevant to State legislation:</p> <p><i>Enter into an agreed delivery arrangement to deliver an environmental offset, in accordance with the <b>Environmental Offsets Act 2014</b>, to counterbalance the significant residual impacts on the matter/s of state environmental significance.</i></p> <p>The Queensland Government financial offset calculator indicates approximately \$200,000 will be required for the Matters of State Environmental Significance not covered under this OAMP.</p> <p>No plans for the Offset Area, that are not outlined as a management action under this OAMP, have been referred to in this document.</p>

### 1.3 Offset Area

The Offset Area proposed for the koala and greater glider are direct land based offsets within the Wambo Wind Farm Project Area. The Offset Area (northern portions of Lot 131 SP169294 &, Lot 129 LY322 and Lot 130 LY322) contains remnant and regrowth habitat suitable for the koala and greater glider, as outlined in Figure 1-2.

The Offset Area shares a boundary with Diamondy State Forest, and contains up to 137.9 ha of native vegetation that is proposed to be managed to improve its condition to deliver the required environmental offset for the Project. The vegetation within the Offset Area will provide habitat for the koala and greater glider.



**Legend**

- Project Area
- Offset Area
- Regrowth
- Remnant
- Cadastre
- Local Road
- 4WD and Track
- Unconstructed Road
- Major Watercourse
- Minor Watercourse

**Source:**  
 Base Data - QLD DCDB 2019  
 Imagery - WV2/3 Imagery May/Aug 2020  
 / ESRI World Street Map July 2015

Proposed Offset Area		F1-2
Drawing No: 0532612s_WAM_OS_G003_R9.mxd	Date: 20/04/2022	<b>Diamondy Wind Farm</b> Biodiversity Constrain Assessment
Drawn By: VN / GR	Reviewed By: MR	Client: Cubico
Coordinate System: GDA 1994 MGA Zone 55		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
 0 100 200m	 N	 <b>ERM</b>

## 2. STATUTORY CONTEXT

Offset requirements for the Project Area are governed under the following guidelines and principles:

- The *Environmental Protection and Biodiversity Conservation Act 1999*; and
- Offsets under the EPBC Offsets Policy (DSEWPC, 2012).

### 2.1 *Environmental Protection and Biodiversity Conservation Act 1999 (The EPBC Act)*

The EPBC Act is the Australian Government's foundational environmental legislation. It provides the legal framework to protect and manage nationally and internationally important flora and fauna species and ecological communities. The EPBC Act focuses on the protection of MNES, with the states and territories providing responsible for matters of state and local significance. MNES includes listed and threatened species and communities.

The EPBC Act provides the primary source of environmental offset obligations for the Project through the approval the Project will receive. This approval will require the Proponent to offset residual significant impacts. Specifically, the EPBC Act directs the Proponent to comply with the principles of the underlying EPBC Act Environmental Offsets Policy (DSEWPC, 2012).

### 2.2 *The EPBC Act Environmental Offsets Policy (the EPBC Offsets Policy)*

The EPBC Act Offsets Policy provides guidance on the role of offsets in environmental impact assessments of MNES and the suitability of any proposed offsets for those MNES. If significant impacts on MNES are considered likely and the proposed action is determined a 'controlled action' under the EPBC Act (such as this project has), the EPBC Act Offsets Policy will apply.

The EPBC Offsets Policy has five key aims. These are to:

1. Ensure the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act;
2. Provide proponents, the community and other stakeholders with greater certainty and guidance on how offsets are determined and when they may be considered under the EPBC Act;
3. Deliver improved environmental outcomes by consistently applying the policy;
4. Outline the appropriate nature and scale of offsets and how they are determined; and
5. Provide guidance on acceptable delivery mechanisms for offsets.

### 2.2.1 Policy Principles

The overarching principles that are applied in determining suitability of offsets are set out in this policy. Under the EPBC Offsets Policy, suitable offsets must:

1. Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the proposed action;
2. Be built around direct offsets (but may include other compensatory measures);
3. Be in proportion to the level of statutory protection that applies to the protected matter;
4. Be of a size and scale proportionate to the residual impacts on the protected matter;
5. Effectively account for and manage the risks of the offset not succeeding;
6. Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs;
7. Be efficient, effective, timely, transparent, scientifically robust and reasonable; and
8. Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

In assessing the suitability, government decision making will be:

1. Informed by scientifically robust information and incorporate the precautionary principle in the absence of scientific certainty; and
2. Conducted in a consistent and transparent manner.

### 3. IMPACT SITE

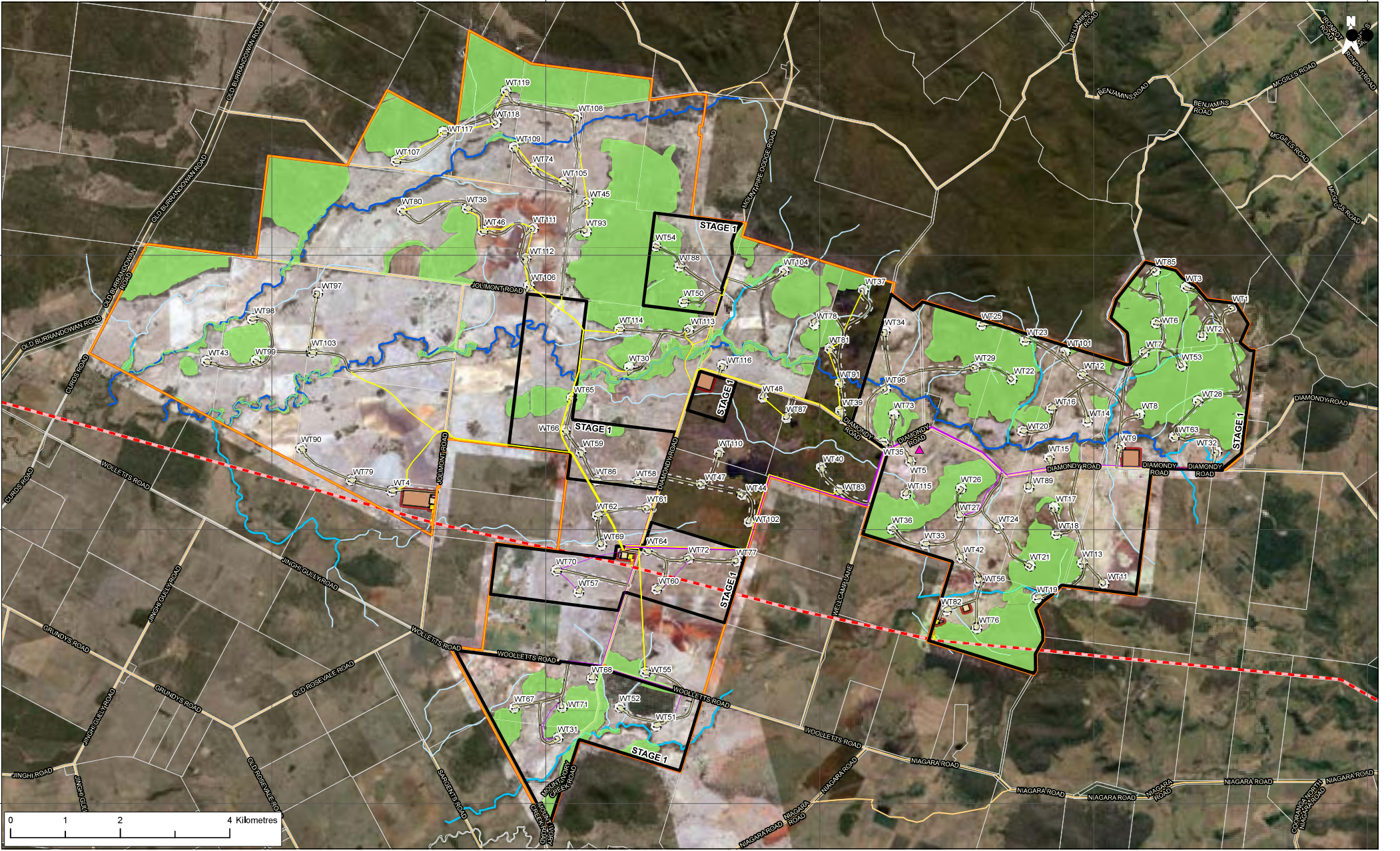
Data obtained from the Wambo Wind Farm Preliminary Documentation (PD) (ERM, 2021b) states that the proposed development will occur across a 498.4 ha development footprint, and based on a per turbine footprint of 0.95 ha, will lead to the clearing of the following areas of habitat for MNES (as shown in Figure 1-1):

- 27.1 ha (assessed as up to 30.0 ha) of habitat critical to the survival of the koala; and
- 25.3 ha (assessed as up to 30.0 ha) of habitat for an important population of the greater glider.

The area of greater glider habitat is wholly contained within the area of impact assessed for the koala. To allow some flexibility in final design, the impact assessment has adopted an approach of increasing the area of impact proposed to be offset for both species to 30ha, to provide a buffer to allow for some flexibility when micro-siting turbine locations during the detailed design stage of the Project.

At detailed design phase, and prior to construction, opportunities for micro-siting of infrastructure to further minimise impacts to important habitat features for MNES (e.g. koala food trees, hollow bearing trees) will be considered. The micro-siting will involve on-ground assessments immediately prior to clearing (pre-clearance surveys) at potential infrastructure locations to determine specific values to MNES and consider opportunities to refine the location of turbines up to 100m from current mapped locations. Through the detailed design and micro-siting process, habitat for koala and greater glider will be taken into account with the aim to minimise impacts as much as practicable, considering other design, engineering and layout constraints.

The impacted areas from the development footprint within the habitat for the recognised MNES requiring offsets is outlined in Figure 3-1 and Figure 3-2, with further detailed maps of the impacted areas shown in Appendix A.

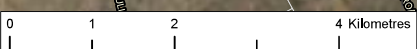
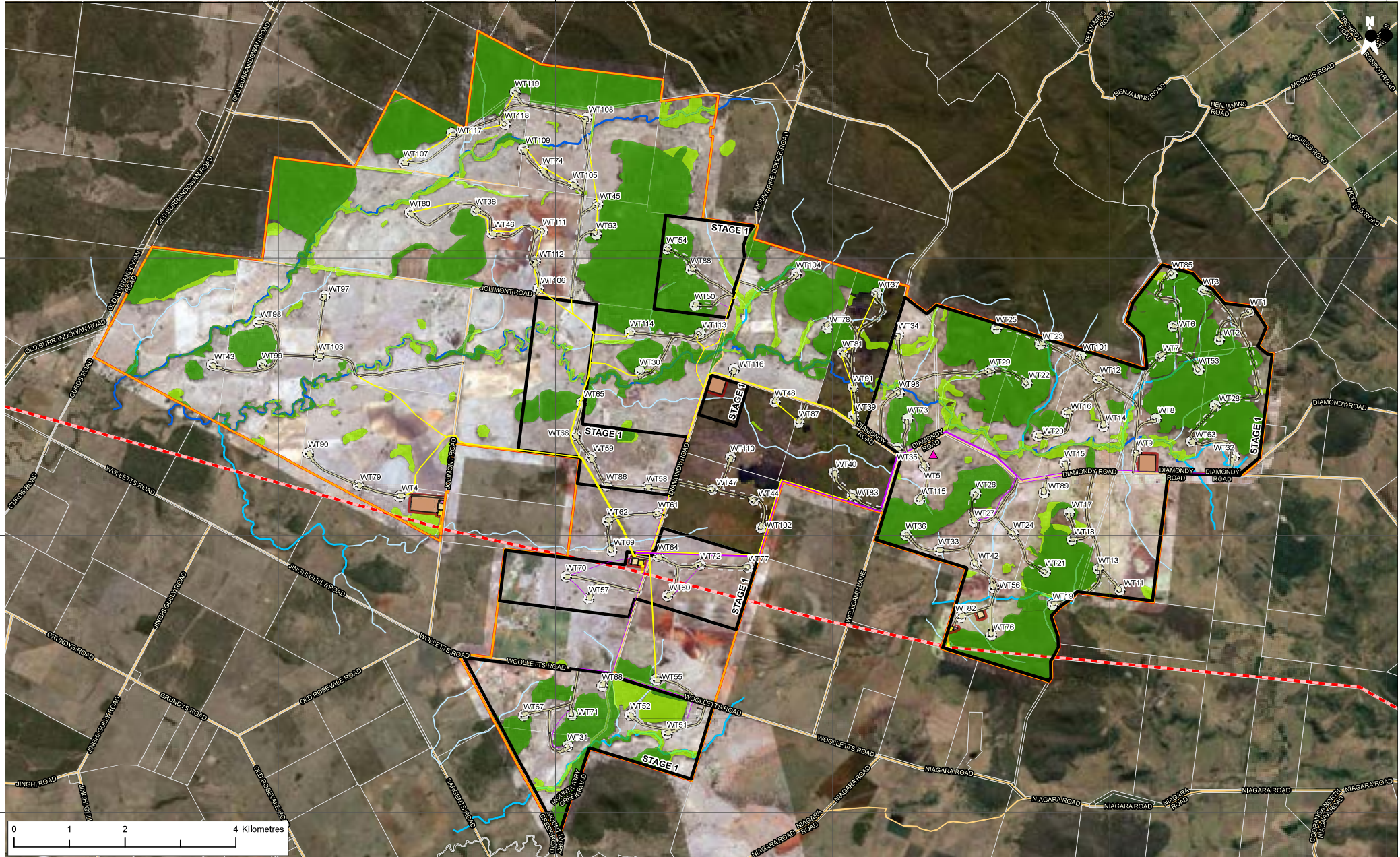


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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- WTG 100m buffer (micrositing and indirect impacts)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
- ▲ Met mast location
- Construction compound & laydown area (stage 1 & 2 shared area)
- O & M facility (stage 1 & 2 shared area)
- Substation (stage 1 & 2 shared area)
- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

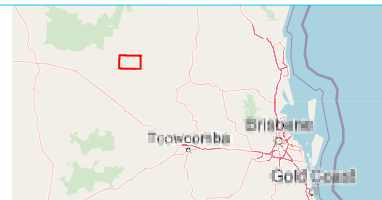


PROJECT			
<b>Wambo Wind Farm</b>			
<b>Figure 3-1: Development Footprint</b>			
<b>Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:65,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 Habitats Prelim	REV	02A
PRODUCED	I Mackey	APPROVED	M Rockwood



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completeness or suitability of the data and does not accept liability for  
any loss, damage or costs, including consequential damage, in relation  
to any use of the data in this map.

- Koala habitat (remnant)
- Koala habitat (koala regrowth)
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- WTG 100m buffer (micrositing and indirect impacts)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
- Met mast location
- Construction compound & laydown area (stage 1 & 2 shared area)
- O & M facility (stage 1 & 2 shared area)
- Substation (stage 1 & 2 shared area)
- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3



<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>Figure 3-2: Development Footprint Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:65,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 Habitats Prelim	REV	02A
PRODUCED	I Mackey	APPROVED	M Rockwood



### 3.1 Residual Impact Description

Data collected by ERM from the 2019, 2020 and 2021 field investigations (ERM, 2021a), and recent high resolution satellite imagery from March 2021, have assisted in identifying presence, providing accurate ground conditions and subsequent impact assessment related to the MNES species requiring offsets.

A summary of the survey effort completed to date is provided below:

- Two ERM ecologists undertook a four day field assessment of accessible sections of the Project Area from 26 November to 29 November 2019, with a total of 120 person hours of survey effort. The focus of this survey involved vegetation and habitat assessments, targeted threatened species surveys and bird and bat surveys;
- Four ERM ecologists undertook a five day field assessment of the Project Area from 7 December to 11 December 2020, with a focus on Threatened Ecological Communities (TEC) ground truthing and validation, habitat assessments, targeted threatened species surveys, bird and bat surveys. There was a total of 280 person hours of survey effort;
- Two ERM ecologists undertook a five day field assessment with a focus on bird surveys of the Project Area from 18 January to 22 January 2021, with a total of 120 person hours of survey effort; and
- Four ERM ecologists undertook a five day field assessment of the Project Area from 15 February to 19 February 2021, with a total of 260 person hours of survey effort. The focus of these surveys was targeted threatened species surveys, habitat assessments as well as bird and bat surveys.

The field surveys across the four survey periods included the following:

- 61 habitat and vegetation assessments;
- 153 bird utilisation surveys (repeated in locations);
- 33 opportunistic bird surveys;
- 15 anabat and five subsequent harp trap bat surveys;
- Four nights of spotlight surveys; and
- Nine camera traps.

The sections below provide a description of each of the threatened species, their habitat preferences and the determination of habitat quality valuations within the Project Area. For a detailed description of survey methodology, vegetation community ground truthing, habitat condition assessments, and koala, and greater glider habitat mapping refer to the PD (ERM, 2021b).

### 3.1.1 Koala

At the time of lodging the EPBC Act referral and completing the impact assessment, the koala was listed as Vulnerable under the EPBC Act and continues to be listed as vulnerable under the Queensland *Nature Conservation Act 1992* (the NC Act). This OAMP has been prepared with consideration of the *National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DAWE, 2022).

The koala has one of the broadest distributions of threatened terrestrial species under the EPBC Act with a range extending from north-eastern Queensland to the south-east corner of Southern Australia. The biological species distribution is widespread in coastal and inland areas that extends over approximately one million square kilometres (Martin & Handasyde, 1999). The occurrence throughout this range is dependent on environmental values.

The koala is generally found in a range of temperate to tropical forests as well as woodlands and semi-arid communities dominated by *Eucalyptus spp* (Martin & Handasyde, 1999). Koalas are also known to utilise regrowth vegetation for foraging and shelter requirements.

#### *Determination of koala habitat*

The vegetation across the Project Area includes eucalypt dominated vegetation and semi-evergreen vine thicket (SEVT) communities within in an agricultural environment, and in accordance with the koala guidelines, is located within the inland context.

The Queensland Wildlife Online database has a records of koala within the locality (the Project Area with a buffer of 10 km) from 2018 and koala faecal pellets were observed during field investigations. The species is considered to occur at very low densities (likely less than 0.05 koalas/ha) based on the frequency of pellet observation (<20% of habitat assessment sites contained koala faecal pellets).

The closest and most recent historical record (2011) of the koala, from the Queensland Wildlife Online database, is just south of the Project Area (within 2 km). Records of koala observations are also present in the nearby Nudley State Forest and Bunya Mountains National Park. Landowners have reported infrequent koala observations (particularly in the western and central parts of the Project Area), in the last 10 years. While no koalas were actually observed during the field investigations despite targeted surveys, koala scats were observed in eucalypt forests throughout the Project Area, particularly in open forests and woodlands associated with drainage lines (dominated by *Eucalyptus populnea*). Scats were found within the Project Area during field surveys.

Most scats found were relatively dry and of medium age (3-6 months). Two of the scats found in habitat assessment survey locations (T23 and T72) in 2019 were considered old (12 months plus) (represented by severe desiccation and no scent). No fresh scats were found during surveys. However it is acknowledged that scat decay rates for koala will vary greatly depending on climactic conditions and season (wet or dry). Based on the evidence, koalas are known to occur within the Project Area, but at very low densities.

Habitat for the species was identified and mapped in the Project Area based on ground truthed vegetation communities (remnant and regrowth forests and woodlands containing mixed eucalypt, corymbia and angophora species). Patches of vegetation that contain two or more koala food tree species, including Narrow-leaved Iron Bark *Eucalyptus crebra*, Poplar Box *Eucalyptus populnea*, Forest Red Gum *Eucalyptus tereticornis* and Spotted Gum *Corymbia citriodora* has been mapped for the Project Area and includes linear fragments associated with riparian areas.

Individual paddock trees are also regarded as koala habitat, and although not mapped (due to scale), paddock trees are included in the impact assessment (based on 40m<sup>2</sup> per tree) presented in the Preliminary Documentation (ERM, 2021b). It is noted, that as part of the contiguous landscape, koalas will tend/prefer to remain in open forest or woodland areas, but may from time to time disperse across open ground. Due to agricultural activities, frequent cool burning and selective logging, habitat quality is generally regarded as low to medium.

### *Significant impact*

As the proposed disturbance to habitat critical to the survival of the koala, as defined by the referral guidelines for koala, is assessed at 30 ha (0.8% of available koala habitat within the Project Area), the proposed development is likely to have an adverse effect on habitat critical to the survival of the koala, as it exceeds the 20 ha impact threshold.

Despite this, the avoidance measures included in the design, the additional micro-siting avoidance, the already highly disturbed nature of the Project Area and low density observed, the proposed development is unlikely to interfere with the recovery of the koala.

#### **3.1.2 Greater Glider**

The greater glider is listed as vulnerable under the EPBC Act and under the NC Act.

The EPBC SPRAT database refers to the EPBC Conservation Advice regarding ecological details of the species. The greater glider is restricted to the eastern portion of Australia, occurring from north Queensland south to central Victoria, dispersing inland to elevations from sea level to 1200 m above sea level. The Advice also notes an isolated inland subpopulation in the Gregory Range west of Townsville and Einasleigh Uplands. Across their broad distribution, the area of occupancy has decreased substantially as a result of land clearing.

The greater glider is largely found in eucalypt forests and woodlands. It is found in taller, montane, moist forests with older trees with abundant hollows (Kavanagh 2000; Eyre 2004). Habitat for the species was identified and mapped in the Project Area based on ground truthed vegetation communities and their extent. The greater glider requires mature eucalypt forests (with access to hollows) and so regrowth vegetation was excluded from the habitat mapping.

#### *Determination of greater glider habitat*

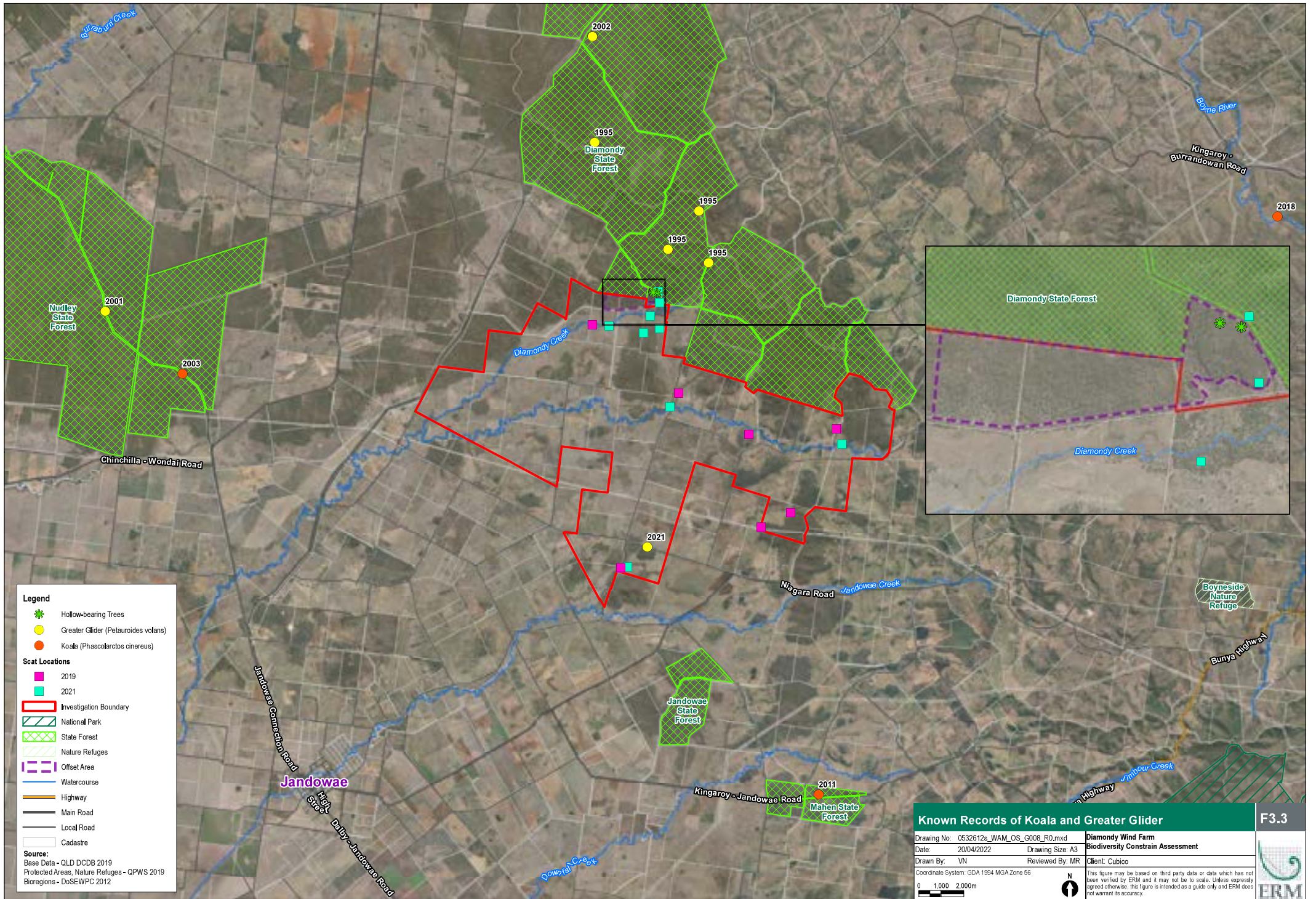
The Project Area contains some areas of habitat of tall, mature eucalypt forests and woodlands, with occasional and infrequent large hollows.

This species was recorded in the southern portion of the Project Area in the 2021 field investigations (spotlighting) near Woollets Road in the south of the Project Area. A single individual was sighted, in *Eucalyptus crebra* dominated vegetation with mature hollow bearing trees present.

### *Significant impact*

This species was observed to be present in the Project Area. The proposed disturbance is assessed at 30 ha (0.9% of available greater glider habitat) of greater glider habitat within the Project Area.

Mitigation aims to avoid and minimise impacts to potential greater glider habitat via micro siting, and moving turbine locations to avoid large hollow bearing trees. However, while the small proportion of clearing that will occur is within an already highly modified Project Area, a significant impact to an important population of the greater glider could not be discounted.



**Legend**

- Hollow-bearing Trees
- Greater Glider (*Petauroides volans*)
- Koala (*Phascolarctos cinereus*)

**Scat Locations**

- 2019
- 2021

**Investigation Boundary**

- Investigation Boundary
- National Park
- State Forest
- Nature Refuges
- Offset Area
- Watercourse
- Highway
- Main Road
- Local Road
- Cadastre

**Source:**  
 Base Data - QLD DCDB 2019  
 Protected Areas, Nature Refuges - QPWS 2019  
 Bioregions - DoSEWPC 2012

Known Records of Koala and Greater Glider		F3.3
Drawing No: 0532612s_WAM_OS_G008_R0.mxd	Diamondy Wind Farm	
Date: 20/04/2022	Biodiversity Constrain Assessment	
Drawn By: VN	Reviewed By: MR	Client: Cubico
Coordinate System: GDA 1994 MGA Zone 56		
0 1,000 2,000m		 This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

## 4. OFFSET DELIVERY

### 4.1 Offset Area

#### 4.1.1 Offset Context

The offsets proposed for the koala and greater glider are direct land based offsets within the Project Area, on three private properties, named Diamondy (within Lot 131 SP169294) and Wonga (Lot 129 and Lot130 LY322) (refer to

Figure 1-2). The Offset Area shares the southern boundary of Diamondy State Forest. The western boundary of the Offset Area is the boundary of the wild dog fence. The Offset Area contains 128 ha of mapped remnant vegetation that is subject to selective logging and 9.9 ha of regrowth open eucalypt forest. The vegetated areas provide known habitat resources for the koala and greater glider.

The Project Area is located in the Queensland Brigalow Belt bioregion and includes a range of landscape features typical of the region, from flat alluvial plains to undulating slopes of grassland with patches of eucalypt dominant and codominant open forest and woodland. There are a number of surface water sources throughout the Project Area, in the form of farm dams as well as drainage lines with associated riparian vegetation.

The dominant land use for the Project Area is agriculture, consisting of cattle grazing with some cultivation. Generally, the agricultural enterprises use a number of land management techniques that have shaped the vegetation communities that occur within the Project Area, with frequent cool burns used to encourage grassy understorey within eucalypt dominated forests and woodlands, selective logging in some areas to source materials for fencing and additional farm revenue and thinning of regrowth vegetation to maintain grasslands for grazing. Cultivated cropping and plantation land uses also occur throughout the Project Area.

Vegetation communities occur as remnant and regrowth vegetation across the Project Area, as defined by the Queensland *Vegetation Management Act 1999* (VM Act). Where remnant vegetation is mapped as Regional Ecosystems (RE), under the VM Act, it was noted that the mapped vegetation communities are generally consistent with on ground observations. However, the RE extents, and where appropriate floristic composition, have been updated where appropriate from ground surveys to appropriately inform habitat mapping for MNES. The majority of the Project Area (9,035 ha or 69.5% of the 12,995 ha Project Area) consists of non-remnant grasslands and cleared areas supporting small to medium agricultural enterprises, with cattle grazing being the dominant activity.

The condition of vegetation communities within the Project Area is modified as a result of current and previous land management practices (agriculture, cattle grazing and selective logging) with most woodlands and open forests dominated by a grassy understorey, including introduced grass species. Vegetation communities generally occur in small to medium sized patches throughout the landscape, with some areas in the north and eastern sections connected to larger patches, including Diamondy State Forest, adjacent to the Project Area. Two ephemeral watercourses and associated linear fragments of riparian vegetation, namely Diamondy Creek and Jingi Jingi Creek intersect the Project Area, while other linear fragments of vegetation occur infrequently along gully lines.

### 4.1.2 Offset Area Description

During the preparation of the Preliminary Documentation (ERM, 2021b), potential Offset Areas were identified throughout the Project Area, in locations that contained koala and greater glider habitat and can be subject to ecological improvements through removing existing pressures on ecological values and management actions to enhance these values.

An area in the northern portion of the Project Area, outside of the wind farm development footprint, has been identified as the Offset Area. Although within lots that contain proposed wind turbine generators, the Offset Area is located outside of the proposed development footprint and the operation of the wind farm will not result in any direct or indirect impacts to the proposed Offset Area. This area contains both regrowth and remnant eucalypt forest, that has been subject to historical and current impacts from grazing and selective logging (additional detail on these pressures detailed in Section 4.1.3 of this OAMP).

The total proposed Offset Area is 137.9 ha and contains both regrowth and remnant koala and greater glider habitat. This Offset Area has been chosen for the following reasons:

- The 9.9 ha of regrowth vegetation within the Offset Area consists of *Eucalyptus crebra* and *Corymbia citriodora* dominated open forest. The dominant species mentioned in these vegetation communities are known koala food trees; and
- The remnant vegetation is connected to the large patch of vegetation of a similar condition and age in the centre of the Project Area and Diamondy State Forest, and so will maintain the habitat connectivity and continuity of koala and greater glider habitat. The remnant vegetation within the proposed Offset Area is 128 ha.

Within the Offset Area, there is currently a low density of hollow-bearing trees due to the current and historical practice of selective logging to obtain timber for farming uses. This practice has resulted in a younger age cohort of eucalypt trees in the Offset Area. Evidence of this disturbance on the structure of the mapped remnant areas is shown from the measured number of large trees being an average of 54% of the benchmark value for the remnant vegetation assessment unit. Two hollow bearing trees, suitable for use by greater glider with an opening greater than (>20 cm dbh) were located in the Offset Area during field surveys completed by ERM for the preparation of this OAMP.

The regrowth vegetation is of good quality (10-15 years age) and supports additional connectivity from the Project Area to the State Forest, and between remnant patches within the Offset Area. This regrowth vegetation contains 9.9 ha of *Eucalyptus tereticornis* dominated open forest with *Eucalyptus populnea*, *Eucalyptus crebra* and *Corymbia citriodora*. The localised Offset Area within one northern section of the Project Area ensures that connectivity and continuity of the landscape is maintained for koalas and greater gliders. The Offset Area is not proposed to contain turbines or any infrastructure required for the construction and operation of the wind farm. The area of regrowth vegetation within the Offset Area has a lower structural integrity, with less large trees (39% of the benchmark) indicating fewer suitable hollows for greater glider.

#### 4.1.2.1 Koala habitat and presence

The Offset Area contains four known koala food tree species (*Eucalyptus tereticornis*, *Eucalyptus populnea*, *Eucalyptus crebra* and *Corymbia citriodora*).

Field surveys completed in 2021 across the Offset Areas confirmed evidence of koala presence, through location of scats in areas of remnant and regrowth that are estimated to be 6-12 months old (Figure 3-3). Records within the greater locality are sparsely distributed, providing evidence for a low-density population. The closest recent record occurs in Nudley State Forest, approximately 13 km west of the Project Area. Further records are 13 km, 14 km, and 15 km from the Project Area from 2011, 2018, and 2011, respectively. Records indicate single individuals observed, two of which were to the southwest, and one in Jandowae.

#### 4.1.2.2 Greater glider habitat and presence

Field investigations completed as part of the preparation of this OAMP in December 2021 recorded the location of two hollow-bearing trees, suitable for use by greater glider in the north-east corner of the Offset Area (Figure 3-3). During the field surveys for the impact assessment phase of the project, a greater glider was observed in 2020 in the Project Area (near Woolletts Road). Within the locality, the most recent greater glider records exist from 2002 from within Diamondy State Forest. There are also five records within 2km of the Offset Area from 1995 (ALA, 2002).

This species has also been recorded within the Diamondy State Forest (record from 2002). It is noted that this single record from the Queensland Wildnet database notes six individuals were recorded. This indicates that the greater glider observations at this point were recorded from a survey event, across the State Forest and not at a single location. There are also an additional five records from 1995 in Diamondy State Forest, the closest being within 2km of the offset area. This provides evidence that a population occurs within the State Forest and would likely utilise suitable habitat in the Project Area and the Offset Area as they are directly connected through a vegetated link and continuous canopy cover.

Greater glider has also been recorded extensively and frequently at other state forests in the locality (Nudley, Jarrah, Yarraman). Additional recent (with 20 years) records exist in Nudley State Forest to the west, approximately 13 km west, containing 6 records since 2001. Further northwest exists nine records in the large Barakula State Forest, of which the closest record is approximately 25 km. These records span a timeframe of 2000 to 2010.

The Offset Area, and the koala and greater glider habitat that it contains, is also directly connected to Diamondy State Forest by a large, contiguous patch of eucalypt forest with a connected canopy cover between the State Forest and the Offset Area. Note also, records of greater glider are common throughout State Forests in the locality, in Nudley State Forest and Barakula State Forest (Smith et al., 2006), clearly demonstrating a larger population in the locality.



**Figure 4-1 Mature Hollow Bearing Tree (left), and Regrowth (right), within the Offset Area**

The principles of the EPBC Act Offsets Policy (particularly Sections 6 and 7 of the Offsets Policy) and how the offset proposal will meet the principles, is outlined in Table 4-1. Importantly, the proposed Offset Area exceeds the requirements as demonstrated by the EPBC Act *Offsets Assessment Guide* (OAG) calculator and at the time when actual disturbance to koala and greater glider habitat is known, the final agreement with the landholder will define the Offset Area in line with the EPBC Act Offsets Policy.

Separate EPBC Act Offset Assessment Guide calculations have been completed for greater glider and koala, with habitat quality assessments completed using a modified template to score habitat quality, based on the Queensland *Guide for determining terrestrial habitat quality*. These assessments demonstrate that the proposed offset meets 103% of the required offset for koala and 104% of the required offset for greater glider.

**Table 4-1 EPBC Act Offset Policy Principles and Project Compliance**

EPBC Act Offset Principles (DSEWPC, 2012).	Project Offset Compliance
Must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	<p>The proposed action has been assessed to result in the loss of up to 30.0 ha of koala and greater glider habitat within the Project Area. The offset will deliver improved condition and quality of the vegetation within the proposed Offset Area by improving the measured habitat quality, removing existing logging activities, and implementing weed management procedures.</p> <p>The proposed offset will result in the protection of remnant and regrowth koala and greater glider habitat as well as a quantitative increase in this habitat quality through reduction in grazing pressure, removal of selective logging practices, weed management and improved fire regimes for the maintenance of biodiversity values. Management actions will be undertaken to ensure the Offset Area remains protected and habitat quality for the protected matters (koala and greater glider) is maintained and improved throughout the duration of the impact.</p> <p>Actions that would be implemented to protect the Offset Area including the prevention of vegetation clearing and selective logging, low intensity cattle grazing, promotion of regrowth and recruitment of eucalypts, protection of denning trees for greater glider and weed and pest fauna management. The Offset Area will ensure the maintenance and improvement of habitat connectivity within the Project Area. These environmental objectives are consistent with the principles outlined in the approved conservation advice for these species (TSSC, 2016) and the Conservation Advice for <i>Phascolarctos cinereus</i> (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (DAWE, 2022).</p>
Must be built around direct offsets but may include other compensatory measures	<p>The offsets proposed for the koala and greater glider are both delivered using direct, land-based offsets. The Offset Area shares a boundary with Diamondy State Forest (within Lots 131 SP169294, Lot 129 LY322 and Lot 130 LY322) (refer to Figure 1-2). The Offset Area contains 128 ha of remnant vegetation and 9.9 ha of regrowth vegetation. This exceeds the minimum of 90% direct offset requirements per the EPBC Offset Policy (DSEWPC, 2012a) and also demonstrates that over 100% of the offset can be met with direct measures.</p>
Must be in proportion to the level of statutory protection that applies to the protected matter	<p>The Offset Area has been considered relevant to the vulnerable threat status for both impacted species and is considered to meet the requirements for offsets for both species.</p>



EPBC Act Offset Principles (DSEWPC, 2012).	Project Offset Compliance
Must be of a size and scale proportionate to the residual impacts on the protected matter	<p>The size and scale of the offset has been assessed using the EPBC Act Offset Assessment Guide tool. This demonstrates that the 137.9 ha of habitat in the Offset Area will be sufficient to offset the removal of up to 30 ha of koala and greater glider habitat within the Project Area. Using the offset calculator it was determined that this offset was 103% of the offset requirement for koala and 106% of the offset requirement for greater glider. The final Offset Area subject to the landholder agreement will be based on the actual disturbance to koala and greater glider habitat (in accordance with approval condition 7, which allows for a reduced impact based on completed layout), with the Offset Area to be in line with the EPBC Act Offsets Policy.</p>
Must effectively account for and manage the risks of the offset not succeeding	<p>This OAMP details the risk mitigation, management and monitoring and reporting of the Offset Area. This will ensure that conservation objectives for the Offset Area are achieved. Key threats to the Offset Area will be actively managed, including removal of selective logging, promotion of eucalypt regrowth, vegetation protection and weed management. This will be completed in accordance with the OAMP. The risk of the offsets not succeeding has been factored into the EPBC Act Offset Assessment Guide calculator, with confidence in result of greater glider offset set at 65% and confidence in result for koala set at 75%.</p> <p>Adaptive management will be implemented as part of the OAMP, and will ensure that changes and updates can be made to management actions, if circumstances in the Offset Area changes.</p> <p>Additionally, alternative lots within the Project Area have been identified to contain potential suitable areas for offset, and can be further investigated should the preferred offset not achieve the completion criteria provided in Section 4.3 of this OAMP.</p>
Must be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see Section 7.6)	<p>The regrowth and remnant areas within the proposed Offset Area are not currently completely protected by law in Queensland, required to be managed for a conservation purpose or a part of a recovery plan/planning scheme for the koala or greater glider. By including the Offset Area as a Category A (offset area) under the VM Act, additional protection is placed over the vegetation so that existing pressures on the condition can be removed.</p> <p>This Offset Area has not previously been used as part of a recovery plan or conservation outcome. Thus, the proposed Offset Area is additional protection to what is already in place under planning regulations/schemes.</p>
Must be efficient, effective, timely, transparent, scientifically robust and reasonable	<p>The direct offset containing 137.9 ha of koala and greater glider habitat is the most efficient and effective way to counteract the impact to koala and greater glider habitat within the Project Area.</p> <p>The Offset Area contains vegetation communities that are both remnant and regrowth. The Offset Area contains assessment units that are in a remnant and regrowth condition, containing habitat for the species where hollow bearing trees and larger stemmed trees will be retained and managed. Based on the transect data collected using the Modified Habitat Quality Assessment (MHQA), the proposed Offset Areas have a low number of large trees and canopy cover when compared to the benchmark condition. Through implementation of this OAMP there are opportunities to improve these structural characteristics.</p> <p>Hollow-bearing tree management includes the exclusion of selective logging in the Offset Area (this practice being observed within the Project Area during the 2020 and 2021 surveys). The exclusion of selective logging in the Offset Area will encourage mature trees to develop, resulting in a higher density of hollow bearing trees.</p> <p>Measurable completion criteria have been proposed so that the Offset Area is planned to reach 75% of the specified RE benchmark using the BioCondition and MHQA method in the outlined timeframe (20 years). These objectives are proposed to be achieved within a 20 year time frame. Completion criteria are further detailed in <b>Section 4.3</b>.</p> <p>The OAMP contains reasonable and scientific mitigation and management measures that will be implemented for the duration of the offset.</p>

EPBC Act Offset Principles (DSEWPC, 2012).	Project Offset Compliance
Must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	<p>The OAMP includes clear and detailed objectives (refer to <b>Section 4</b>), as well as the specific timelines that will be in place to ensure management of the Offset Area are followed and implemented.</p> <p>The responsibilities of the Proponent and landholder, as well as monitoring and auditing measures, are detailed in <b>Section 5</b>.</p>

The offset will deliver improved condition and quality of the vegetation within the proposed Offset Area through management of regrowth and remnant vegetation (as measured against Queensland RE benchmark data in the MHQA), and improve quality of both remnant and regrowth habitats by removing logging activities and implementing weed management procedures. This will result in the increased ecological condition of the habitat within the Offset Area for both koala and greater glider.

This will increase its value to both the koala and greater glider, as well as other threatened and non-threatened species within the Project Area and broader locality (e.g. grey-headed flying-fox). The improvement in the measured habitat quality will allow for the establishment of mature, hollow-bearing trees, which will ensure nesting and sheltering opportunities for the greater glider and other species dependent upon such resources. The primary objective is promoting regrowth and remnant areas to an appropriate condition to improve habitat value for koala and greater glider.

The Offset Area contains four known koala food tree species (*Eucalyptus tereticornis*, *Eucalyptus populnea*, *Eucalyptus crebra*, *Corymbia citriodora*). Improving the Offset Area in condition and quality will ensure the ongoing viability of the koala population. The Offset Area is directly connected, with canopy cover to the Diamondy State Forest and will maintain population viability through ensuring habitat connectivity across the landscape.

Without the offsets area, the condition of the offset would likely have declined due to continued selective logging and potential clearance of regrowth vegetation for which no existing protection is provided. Remnant vegetation on both lots is designated as a Category B Area, and can still be impacted under development codes, including timber harvesting and necessary infrastructure such as boundary fences. This OAMP affords the Offset Area protections under which development codes cannot be applied to and is additional protection above what is currently applied.

It should be noted that, within the Offset Area there is an easement, for which there is no intention to be used. This easement is a DTMR parcel and from a regulatory perspective cannot be protected under the legally protected Offset Area mechanism (VDEC). However, management of the easement is currently the responsibility of the landholder and a commitment will be made under this OAMP that the vegetation that is within the easement will remain and managed in the same way as regrowth and remnant vegetation with in the offset. Ultimately, this will maintain connectivity across the offset.

### 4.1.3 Offset Area Assessments

The Offset Area is currently used for agricultural purposes and selective logging. Currently cattle are stocked in the Offset Area at a rate of 1 per 5ha.

Selective logging is currently carried out as an activity undertaken in the Offset Area. The landowner is currently able to selectively remove timber from these areas for the purpose of harvesting trees for to support farming practices under the *Managing a native forest practice self-assessable vegetation clearing code*, which permits removal of trees for marketable timber products under the Queensland *Vegetation Management Act 1999*. This practice of selective logging has resulted in the thinning of younger eucalypt trees with straight trunks, suitable for fencing and other agricultural uses. Selective logging occurs every 5-10 years, and targets trees with a diameter-at-breast height (dbh) of 30-60cm. The clearing code does require retention of a mix of age classes, however the code allows selective logging so that up to 10 large trees (defined as dbh > 30cm) per hectare are retained in the logged area.

Evidence of selective logging was obtained during field surveys in December 2021. Three transects were taken at each MHQA transect location and a tree standing count and tree logged count were undertaken. Standing trees were qualified as trees that were 10cm dbh or above. At Wonga, the data shows that in the last 10 years (the last logging occurred 10 years ago as indicated by the landholder), approximately 8-10 logs per hectare were taken, while at Diamondy, approximately 1-2 log per hectare taken. This is outlined below in Table 4-2 and in Figure 4-2.

**Table 4-2 Logged Tree Count – December 2021**

Location	Standing tree count	Logged trees count
<b>Lot 103 LY322 – Wonga</b>		
<i>Site 1 (as per Figure 5-1)</i>		
Transect 1 (50mx10m)	30	1
Transect 2 (50mx10m)	25	1
Transect 3 (50mx10m)	28	4
<i>Site 2 (as per Figure 5-1)</i>		
Transect 1 (50mx10m)	22	2
Transect 2 (50mx10m)	25	8
Transect 3 (50mx10m)	38	0
<b>Lot 131 SP169294 – Diamondy</b>		
<i>Site 3 (as per Figure 5-1)</i>		
Transect 1 (50mx10m)	13	0
Transect 2 (50mx10m)	16	0
Transect 3 (50mx10m)	21	0
<i>Site 6 (as per Figure 5-1)</i>		
Transect 1 (50mx10m)	36	1
Transect 2 (50mx10m)	24	0
Transect 3 (50mx10m)	8	0



**Figure 4-2 Photos of Logged Tree Stump (Site 1) with dbh 43 cm (top) and Transect (Site 1) Example for Tree Count Survey (Bottom)**

This selective logging has reduced the density of large trees in the Offset Area, that have the capacity to develop hollows and contribute to a benchmark quality patch of open eucalypt forest that will benefit both koala and greater glider.

Under the RE benchmark used for the offset assessment units, large eucalypt trees are those defined as having a diameter-at-breast height (dbh) of 46cm. There were no trees of this size recorded within any of the transects sampled to support the habitat assessment of the Offset Areas. Notwithstanding this result, some trees of this size and larger were observed within the areas of eucalypt open forest in the Offset Area. For the remnant assessment unit (AU1), an average of 55% of the benchmark number of large trees was included in the calculations and for the regrowth assessment unit (AU2) 39% of the benchmark was recorded.

The current agricultural management of the Offset Areas also includes frequent burns, every 2-3 years to maintain an open grassy structure to benefit grazing, reduce weed cover and to reduce *Acacia spp.* regrowth. Whilst beneficial for the grazing land use, this fire return interval is too frequent for the maintenance of a good quality, open eucalypt forest and can result in further thinning of eucalypt cover and the development of larger, mature trees.

The presence of koalas has been confirmed at the Offset Area, with pellets found in April 2021. The offset is located in the Project Area approximately 8 km north of where the greater glider was observed in 2021 and a greater glider record is also known from 1995 from within Diamondy State Forest approximately 2 km from the proposed Offset Area, as has been provided earlier in this section.

The quality of the Offset Area for koala and greater glider has been assessed following field investigations, including collection of plot based information in areas of remnant and regrowth habitat for koala and greater glider in both impact and offset areas. The assessment of quality through habitat and vegetation assessments, where 61 assessments were undertaken in the four field investigations from 2019-2021. The overall quality of the habitat in the impacted areas was assessed as a score of 7 for koala and 6 for greater glider (using the Modified Habitat Quality Assessment [MHQA] according to the BioCondition Assessment Manual (Eyre et al. 2015)).

The starting quality of the proposed offset (regrowth and remnant) has a score of 7 for koala and a score of 6 for greater glider. This is documented in the MHQA assessment, provided to DAWE. When the Offset Area is assessed using the EPBC Act Offset Assessment Guide, it is demonstrated that the proposed Offset Area meets over 100% of the required offset.

The details on the parameters entered into the calculator tool are summarised in Table 4-3.

**Table 4-3 Offset Assessment Guide Inputs**

Offset Calculator Factor	Project Relevance and Explanation
Quality of critical habitat being impacted	<p>The MHQA methodology has been used to derive a habitat quality score for the impacted area of koala and greater glider habitat, using metrics to assess site condition, site context and species stocking rate.</p> <p><b>Koala</b></p> <p>The MHQA tool has been used for the impacted areas and calculated to be a score of <b>7</b>, with site data collected from areas of remnant vegetation using the MHQA plot attributes. This is largely due to evidence of koalas in the Project Area, low-key threatening processes, as well as good connectivity as the Project Area adjoins the Diamondy State Forest. There is however, a number of historical and current land use practices within the impact areas that have affected the habitat quality of the impacted vegetation, including grazing, selective logging and management of ground layers for agricultural purposes.</p> <p><b>Greater Glider</b></p> <p>The quality of greater glider habitat in the eucalypt open forest impact area was measured to be a <b>6</b> using the MHQA method. The lower quality score is caused by reduced connectedness and species mobility scores for this species and a lower species stocking rate due to limited breeding habitat on the impact site.</p>
Start quality of Offset Area	<p>To support the preparation of this OAMP, MHQA transect data was collected at three plots within the area of remnant open eucalypt forest and two plots in the regrowth open eucalypt forest within the Offset Area by ERM ecologists in December 2021.</p> <p><i>Koala – eucalypt open forest offset area</i> <b>Score = 7</b></p> <p><i>Greater Glider – eucalypt open forest offset area</i> <b>Score = 6</b></p> <p>Connected to Diamondy State forest; good species mobility and adjacent records.</p>
Future quality of Offset Area without offset	<p>It is anticipated that the Offset Area will not increase in quality over time due to grazing pressures and selected logging activities and thinning permitted under the current land use and legislation in Queensland.</p> <p>The quality of the proposed Offset Area without the protection provided in perpetuity and the management actions outlined in this OAMP will likely deteriorate over time due to pressures associated with continued selective logging, potential for weed encroachment</p>
Future quality of Offset Area with offset	<p>The management of the offset for koala and greater glider will include the provision of weed management, low intensity grazing and exclusion of selective-logging. The future quality of the eucalypt open forest Offset Areas for koala is assessed to reach a score of <b>8</b> and greater glider assessed to reach a score of <b>7</b>. This represents an achievable habitat quality score increase of one point from the current measured habitat quality score, as a result of the proposed protection and management actions committed to in this OAMP.</p> <p>This area of eucalypt forest regrowth which will continue to develop into mature eucalypt open forest as the Offset Area is protected from permitted selective logging and grazing pressures in perpetuity. This will allow the development of a connected canopy of eucalypt open forest, with hollow-bearing trees providing denning and breeding resources for greater glider.</p>
Time over which loss if averted	<p>The time over which loss is averted in the foreseeable timeframe over which changes in the level of risk to a proposed offset can be considered and quantified (Section F of the Offset calculation guidelines). The loss must be averted for the duration of the impacts, i.e. in perpetuity; however, offset predictions and calculations are made over a 20 year time period due to this being an appropriate length of time to assess risk and completion criteria.</p> <p>It is noted that the longer the time frame, the more value this provides in terms of achieving conservation outcomes (DSEWPC, 2012). The proposed offset has been chosen as it provides both remnant and regrowth habitat for koala and greater glider and connects the Project Area to the broader landscape. The offset is proposed to be secured via an on-title agreement in perpetuity.</p>
Time until ecological benefit	<p>The time until ecological benefit is the estimated time that it will take for the habitat quality improvement of the proposed offset to be achieved. The proposed protection of vegetation from grazing pressures, as well as the continuation of effective weed</p>

Offset Calculator Factor	Project Relevance and Explanation
	<p>management measures and protection of natural regeneration of vegetation, will likely result in an ecological benefit being realised in a 20 year period.</p> <p>This time period would be sufficient to provide a cover of eucalypt regrowth suitable as movement and foraging habitat for koala, and foraging habitat for greater glider. Ongoing protection of the offset area in perpetuity will remove the current pressures associated with selective logging and grazing, allowing the continued improvement of habitat quality, particularly for greater gliders as they require old growth trees for hollows.</p>
Risk of loss (%) without offset	<p>The proposed offset must be strategically designated to enhance linkages between areas of remnant vegetation within the broader landscape. In its current status and under the <i>Vegetation Management Act 1999</i> (Qld), the remnant and regrowth vegetation can be selectively logged for rural purposes by the landholder. As the site is currently grazed and selectively logged, and currently has no formal weed management, the risk of loss without an offset is estimated to be 4.81%, for this area in Queensland. This value is in accordance with the risk of loss estimate over 20 years for the Western Downs Local Government Area, as provided in Maseyk, Evans &amp; Maron (2017). To account for the fact that the site has not been cleared to date, indicating lower confidence in this background rate of loss, a score of 60% has been used for confidence in this risk of loss estimate.</p>
Risk of loss (%) with offset	<p>The proposed offset will ensure that the vegetation is enhanced and protected through means such as a Voluntary Declaration attached to the land title. This will allow for environmental objectives to be implemented through an OAMP which will include protection of natural regeneration of vegetation, weed management as well as consideration of additional fencing to manage grazing activities. The Voluntary Declaration is legally binding and will provide for a lower risk of loss. Risk of loss with offset has been set at 0% as the proposed securement mechanism will be established so that the offset area is protected in perpetuity.</p>
Confidence in result (%)	<p>For the delivery of the offsets in the areas of remnant and regrowth eucalypt forest, the confidence level in the two unit gain in the offset quality is 75% for the koala offset in eucalypt open forest.</p> <p>Confidence in result for greater glider offsets in eucalypt open forest reduced to <b>65%</b> to account for uncertainty in hollow development required for den trees.</p> <p>It is noted that there is a low risk that unforeseen events may occur that may result in the impacts to vegetation.</p>
Percentage of impact offset	<p><b>Koala eucalypt open forest offset area</b> 105.05%</p> <p><b>Greater Glider eucalypt open forest offset area</b> 106.37%</p>

## 4.2 Offset Area Management Actions

The management actions have been designed to address the EPBC Act Approval Conditions relevant to the OAMP, in particular condition 6(d) and 6(g) that require achievable ecological outcomes. The management actions outlined in Table 4-4 are the OAMPs ecological outcomes and these terms throughout are interchangeable, and relate to those environmental objectives set out in Table 4-5.

Management actions have been designed to achieve the predicted gains in vegetation integrity to deliver the required offset of koala and greater glider. The focus of the management actions will be to increase the MHQA metrics most associated with improving habitat quality for koala and greater glider, being number of large eucalypt trees and tree canopy cover. Large trees are particularly relevant for greater glider, as it will be used as an indicator for the development of hollows. Increased canopy cover is an indicator of the development of an intact eucalypt forest, providing improved habitat conditions for both koala and greater glider.

Management actions have been divided into two categories, required management actions and restorative management actions. Restorative management actions are for zones that require higher levels of restoration from plantings, habitat enhancements and vegetation establishment. The required restorative management actions are detailed in Table 4-4 below.

**Table 4-4 Required Management Actions**

Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
<p>Failure of regrowth vegetation improvement and eucalypt recruitment and/or completion criteria are unlikely to be met</p>	<p>Implementation of the management actions and adaptive management framework as outlined in this OAMP.</p>	<p>MHQA assessments and monitoring indicate that habitat quality scores for interim performance targets will not be achieved for one or more offset values by:</p> <ul style="list-style-type: none"> <li>■ Year 5</li> <li>■ Year 10</li> <li>■ Year 15; and</li> <li>■ Year 20</li> </ul>	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> <li>■ Within one month after detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes.</li> <li>■ Within two months after detection of the trigger, complete a re-evaluation of the suitability of the relevant management measures in the OAMP. The re-evaluation must identify appropriate corrective actions.</li> </ul> <p>Step 2: Implementation of corrective action/s within eight months of detection of trigger, including, as appropriate:</p> <ul style="list-style-type: none"> <li>■ Approval holder and the landholder review the OAMP with assistance from offset coordinator and relevant Senior Land Management and/or Senior Ecologists, if required, to provide input on the effectiveness of the management actions.</li> <li>■ Commitments made to maintain frequency and intensity of pest animal and weed control measures and/or revise the type of measures to be implemented.</li> <li>■ Where interim habitat quality criteria are not likely to be met in the required timeframe, the approval holder will notify the Commonwealth within one week and implement additional management measures.</li> <li>■ New or additional management measures to be undertaken will require the OAMP to be revised and submitted for approval by the Commonwealth Minister for the Environment; and</li> <li>■ Where final habitat quality scores are not likely to be met by year 20, the approval holder will notify the Commonwealth within one week and will obtain advice from Senior Ecologists and land managers with the aim of identifying appropriate additional management interventions, such as extending the timeframes and intensifying management measures, including plantings, to enhance habitat. This may include provision of an additional offset, if required.</li> </ul>



Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
<p>Supplementary plantings not establishing</p>	<ul style="list-style-type: none"> <li>■ For the first three months of planting, weekly maintenance will occur. This will include mulching, watering, pest and weed management to support establishment</li> <li>■ Maintaining and promoting eucalypt growth to support natural recruitment and regeneration (pest and weed management as per the routine outlined in the OAMP, cool-burn programs, and removal of thinning practices).</li> </ul>	<p>MHQA assessments and monitoring indicate that habitat quality scores for interim performance targets will not be achieved for one or more offset values by:</p> <ul style="list-style-type: none"> <li>■ Year 5</li> <li>■ Year 10</li> <li>■ Year 15</li> <li>■ Year 20</li> </ul> <p>Not attaining, or predicted to not attain, an 80% survival rate of planted stock at each annual monitoring</p>	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> <li>■ Within one month after detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes; and</li> <li>■ Within two months after detection of the trigger, complete a re-evaluation of the suitability of the relevant management measures in the OAMP. The re-evaluation must identify appropriate corrective actions.</li> </ul> <p>Step 2: Implementation of corrective action/s within six months of detection of trigger, including, as appropriate:</p> <ul style="list-style-type: none"> <li>■ Approval holder and the landholder review the OAMP with assistance from offset coordinator and relevant Senior Land Management and/or Senior Ecologists, if required, to provide input on the effectiveness of the management actions.</li> <li>■ Commitments made to maintain frequency and intensity of pest animal and weed control measures and/or revise the type of measures to be implemented.</li> <li>■ Increase or implement maintenance measures for the planted stock (increased watering, additional plantings, additional mulch, etc.); and</li> <li>■ New or additional management measures to be undertaken will require the OAMP to be revised and submitted for approval by the Commonwealth Minister for the Environment.</li> </ul>

Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
<p>Introduction, establishment and spread of non-native weeds</p>	<ul style="list-style-type: none"> <li>■ Baseline weed data for the Offset Area will be conducted within the first 12 months of implementation.</li> <li>■ A primary management action for weed control will be low intensity grazing by cattle (stock management).</li> <li>■ Herbicide, mechanical and Biological control will be put into action to reduce the spread of mother of millions, parthenium and lantana.</li> <li>■ Fire will be used every 6-10 years to assist with weed management and non-eucalypt woody undergrowth. This schedule is in line with the RE fire management regime recommended for the maintenance of biodiversity for RE 11.10.1.</li> </ul> <p>These weed control actions should be undertaken in the first year throughout the Offset Area and then at the optimum time in the weeds life cycle control will periodically take place to minimise the spread of existing weeds.</p>	<p>A declared new invasive species of weed is identified, or a new occurrence of an invasive species is observed, at one or more sites, during any site inspection or other monitoring.</p>	<p>Step 1: Investigate the cause of the trigger. Step 2: Implement. corrective actions</p> <p>When becoming aware of invasive weed species being present in greater than 5% of the Offset Area the Landholder has to implement extra weed control measures and it has to occur within one month.</p> <p>All new weed species and required intensification of weed management need to be reported in the offset monitoring reports.</p>

Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
Fire	<p>Implement fire management in accordance with the following requirements:</p> <ul style="list-style-type: none"> <li>■ If there are one or more bushfires that are current in the region and they are considered threatening to the Offset Area, then coordinate with all relevant fire authorities to determine an appropriate method to protect the Offset Area.</li> <li>■ The approval holder will maintain firebreaks along boundaries of the Lots within which the Offset Area is defined. These breaks must be inspected periodically and have maintenance occur once every three years at a minimum.</li> <li>■ Low intensity grazing by livestock, and cool controlled burns in winter months on a 6-10 year return interval (or more frequently to manage weeds, non-eucalypt woody vegetation or fuel load), to maintain the required structure and condition of the Offset Area to improve habitat value.</li> <li>■ Controlled burns must follow the fire management guidelines specific for the RE within the Offset Area (11.10.1). <ul style="list-style-type: none"> <li>○ Burns are to be undertaken late wet to early dry season when there is good soil moisture, or early storm season or after good spring rains</li> <li>○ Burns are to be a low intensity with intervals from 6-10 years (or more frequently to manage weeds, non-eucalypt woody vegetation or fuel load)</li> </ul> </li> </ul> <p><i>Important note: if there is fire damage to the Offset Areas then it must be reported by the landholder. The approval holder is required to report any damage to the Offset Areas to the Commonwealth.</i></p>	<p>If unplanned fires occur.</p> <p>The destruction of or significant damage to part or all of the Offset Area and fire breaks.</p>	<p>Step 1: Investigate the cause of the trigger</p> <ul style="list-style-type: none"> <li>■ Within a month of detection of the trigger an investigation has to be completed in the source of the fire and the score of habitat quality (this includes what koala and greater glider habitat has been impacted)</li> </ul> <p>Step 2: Implementation of corrective actions</p> <ul style="list-style-type: none"> <li>■ After an unplanned fire has occurred in the Offset Area, the landholder must notify the approval holder immediately and the approval holder has to reassess and implement new access protocol for any lessees’.</li> <li>■ After an unplanned fire has occurred in the Offset Area, within two months the approval holder will: <ul style="list-style-type: none"> <li>■ Inspect, repair and widen all firebreaks if necessary (must do this without reducing the vegetation of the Offset Area).</li> <li>■ Reassess fuel load reduction practices; and</li> <li>■ Where there is a large amount of damage to the Offset Area, within two months the approval holder must arrange for a MHQA assessment that determines habitat quality loss and report it to the Commonwealth on how the loss will be addressed to meet the requirement of the final completion criteria.</li> </ul> </li> </ul>

Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
Impacts from Feral/Pest Animals	<p>Continue to engage in local control program for foxes and feral dogs as the Offset Area is adjacent to, and east of the dog control fence.</p> <p>Feral animal control will be coordinated with regional eradication programs (e.g. baiting and trapping events) in consultation with Western Downs Regional Council.</p> <p>Noting that fox and wild dog management currently occur by landholder and this OAMP commitment formalises that ongoing control will remain.</p>	Any observation evidence of the presence of feral animals.	<ul style="list-style-type: none"> <li>■ Monthly inspections to record the presence of wallow holes, tracks and visual incidents, e.g. any injury to or predation of koalas, in the offset area will be undertaken.</li> <li>■ On being notified or becoming aware of the presence of large numbers, for example, approximately 10 feral animals or multiple tracks in the offset area at any one time, or any predation of koalas, the Landholder is to implement feral animal control measures within one month.</li> <li>■ Landholder may approach neighbouring landowners to discuss the increase in presence of pest animals and integrate a control program that is appropriate; and</li> <li>■ If impacts from pest animals have not naturally remediated within 6 months of implementing and completion of appropriate control measures the landholder as to complete works to remediate the impacts.</li> </ul>
Removal of mature trees by selective logging	<p>Selective logging practices excluded from Offset Area.</p> <p>Maintain the extent of mature trees within the Offset Area</p>	Unauthorised clearing	<p>Step 1: Investigate cause of trigger (e.g. unauthorised access)</p> <ul style="list-style-type: none"> <li>■ As soon as unauthorised clearing is detected, review existing access restrictions, and inspect signage and property fencing; and</li> <li>■ Within two weeks of detection of the clearing, identify how unauthorised persons accessed the site and identify appropriate corrective actions.</li> </ul> <p>Step 2: Implementation of corrective action/s</p> <ul style="list-style-type: none"> <li>■ All identified actions required to prevent recurrence of the prohibited clearing will be completed within one month of detection of the clearing. These may include (though are not limited to) additional fencing and/or signage and security for the Offset Area;</li> <li>■ MHQA assessments to record extent of damage and progress of management measures, to assess progress toward recovery and towards meeting next interim or final completion criteria; and</li> <li>■ Where unauthorised clearing has been extensive and habitat quality scores are reduced (based on results of MHQA assessments), additional plantings will be undertaken within 6 months of the most recent MHQA assessment, particularly Koala food trees, as needed, and Commonwealth be notified.</li> </ul>

Risk	Management Action	Triggers for Corrective Actions and Adaptive Management	Corrective Actions
Grazing pressures	<ul style="list-style-type: none"> <li>■ Reduce current stocking rates (1 in 5 ha) by 40-60%; and</li> <li>■ Monitor stocking rates of the area throughout the Offset Area.</li> </ul>	<p>Observed/evidence of decline of understory quality and regrowth</p> <p>Reduced density of juvenile eucalypt/acacia species</p>	<p>Step 1: investigate cause of the trigger</p> <ul style="list-style-type: none"> <li>■ As soon as eucalypt establishment and regeneration decline is detected within the Offset Area, review grazing practices and stocking rates.</li> </ul> <p>Step 2:</p> <ul style="list-style-type: none"> <li>■ MHQA assessments to record extent of damage and progress of management measures, to assess progress toward recovery and towards meeting next interim or final completion criteria; and</li> <li>■ Revise grazing practices and stocking rates, which may include lowering stock rates within the Offset Area or exclusion of grazing for a period of time to allow for recovery, as well as higher rotation of stock in most affected areas, with longer spelling periods (may require additional fencing to allow landholder to manage stocking rates).</li> </ul>

#### 4.2.1 Offset Area Management and Protection Additional to those that Currently Exist

While the existing management actions associated with weed and pest management are standard farm practices they maintain a specific focus on benefit to the grazing practice. Management actions specified in this OAMP focus on delivering ecological benefit to the protected matters.

Where grazing, fire, weed and pest management actions are combined, the outcomes gained for the protected matters are as follows:

- Management actions (through the various management actions outlined in Table 4-3) aim to deliver an ecological benefit by:
  - Assisting in the regeneration of eucalypt species in regrowth areas. This focus aims to increase eucalypt density and management to maturity. This will aid in habitat condition enhancement through the achievement of regrowth moving towards successful completion criteria.
  - Reducing the current stocking rates in the Offset Area by 40-60%, down from 1 per 5 ha. As well as the additional monitoring of potential grazing pressures in the Offset Area, this will deliver an ecological benefit by assisting regrowth areas and regeneration to achieve increased species maturity and density otherwise removed for grazing practices. This will also aid in habitat enhancement through the achievement of regrowth moving towards successful completion criteria; and
  - Excluding selective logging practices (conducted under permit for the collection of mature trees) within the Offset Area will retain existing hollows and also promote mature tree development, thus increasing the quantity of hollow bearing trees within the Offset Area. Selective logging in the Offset Area would continue without this intervention reducing the amount of mature trees suitable for the protected matters and the reduction of available hollows throughout the Offset Area. This is a key management action for the greater glider as trees with a dbh of 30-60cm are selectively logged and denning/foraging trees for the greater glider within this habitat type are typically >50cm in dbh (Smith et al., 2006).
- The Offset Area contains three known koala food tree species (*Eucalyptus tereticornis*, *Eucalyptus populnea*, *Eucalyptus crebra* and *Corymbia citriodora*). Improving the Offset Area in condition and quality will ensure the ongoing viability of koala population. The Offset Area also contains the preferred tree species for the greater glider, with those species utilised heavily by the species. These tree species include the spotted gum *Corymbia citriodora* and forest red gum *Eucalyptus tereticornis*, which have been noted as being species whose retention is specified as important to greater glider habitat in southern Queensland (Eyre, 2006). This is due to the propensity of these two species to form hollows quickly. A study of greater glider habitat utilisation in Barakula State Forest, approximately 30 km west of the Offset Area, indicated that spotted gum (*Corymbia citriodora*) and ironbark (*Eucalyptus fibrosa*) gum species were utilised for foraging significantly more frequently than its availability in the forest would suggest (Smith et al., 2006). Both remnant and regrowth vegetation in the Offset Area contain these gums as a dominant species; and
- Implementing the OAMP will maintain the frequency of biosecurity management for matters such as feral dog protection and weed management, as a result of increased site inspection and monitoring, and additional feral animal and weed control, where required.

### 4.3 Environmental Objectives & Completion Criteria

The environmental objectives and completion criteria represent the environmental objectives the OAMP aims to achieve the ecological outcomes in Table 4-4.

The overall objective of managing the offset is to improve the quality of vegetation so that it reaches a higher habitat quality score, than as has been measured for the existing baseline condition to be achieved over a 20 year period.

A demonstrated increase in habitat quality, represented as a number of measurable criteria, as defined in the MHQA and Offset Assessment Guide (the calculator – see Table 4-3), will be provided against the baseline condition assessment.

Monitoring results will be analysed to determine if environmental objectives have been met, prior to the completion criteria being achieved. Monitoring against the criteria will demonstrate the success of the management actions being implemented to improve the quality of koala and greater glider habitat. They will also serve to trigger implementation of corrective actions where criteria are not being met. Environmental objectives are provided for the management actions in Table 4-5 and the completion criteria in Table 4-6.

The completion criteria for the Offset Area are as follows:

- WONS managed and no longer in the Offset Area;
- In order to facilitate regrowth to transition to remnant vegetation the following parameters will be assessed against benchmark conditions using the BioCondition assessment method outlined by the Queensland Herbarium in the BioCondition Assessment Manual (Eyre et al., 2015). The method includes collection of data on the following parameters, which will all contribute to an increase in ecological condition and function for koala and greater glider:
  - Native plant species richness – trees;
  - Native plant species richness – shrubs;
  - Native plant species richness – grasses;
  - Native plant species richness – forbs;
  - Tree canopy height (average of emergent, canopy, sub-canopy);
  - Tree canopy cover (average of emergent, canopy, sub-canopy);
  - Number of large eucalypt trees;
  - Shrub canopy cover; and
  - Native grass cover.
- Completion criteria specific to meeting required habitat improvements for koala and greater glider will include meeting 75% of the benchmark value for:
  - Large eucalypt trees, as an indicator of potential hollow-bearing trees, and presence of hollow bearing trees; and
  - Tree canopy cover, as an indicator of mature open eucalypt forest.
- No increase in dogs, foxes and pigs on baseline observances in the Offset Area.

**Table 4-5 Environmental Objectives**

Management Action	Environmental objectives
Fire management	<ul style="list-style-type: none"> <li>■ Fuel levels and burning regime maintained in accordance with ecological outcomes as set out in Table 4-4</li> <li>■ No loss of habitat quality throughout the duration of the impact from wildfires.</li> <li>■ Fire management as per the fire management requirements for RE 11.10.1 (burning frequency 6-10 years or as appropriate to manage fuel loads)</li> <li>■ No unplanned fire in the Offset Area.</li> </ul>
Grazing management	<ul style="list-style-type: none"> <li>■ Evidence of low intensity grazing leading to reduce fuel loads and minimal damage to eucalypt regrowth vegetation</li> <li>■ No loss of habitat quality throughout the duration of the impact from stock permitted to graze within the Offset Area.</li> </ul>
Native vegetation management	<ul style="list-style-type: none"> <li>■ &gt;65% of benchmark RE criteria for regrowth areas in year 10 for number of large eucalypt trees and tree canopy cover</li> <li>■ 75% of benchmark RE criteria for regrowth areas in year 20 for number of large trees and tree canopy cover</li> <li>■ &gt;80% of benchmark RE criteria for Remnant areas in year 10</li> <li>■ &gt;90% of benchmark RE criteria for Remnant areas in year 20</li> <li>■ Maintain the extent of habitat within the Offset Area by prohibiting selective logging practices.</li> </ul>
Integrated pest animal control	<ul style="list-style-type: none"> <li>■ No more than 10 or more feral pigs or two feral dogs during any inspection.</li> </ul>
Integrated weed management and control of high threat weeds	<ul style="list-style-type: none"> <li>■ Baseline weed mapping is completed for the Offset Area and a weed management strategy developed and implemented within 12 months of the commencement of the action and a management strategy developed.</li> <li>■ All Weeds of National Significance (WONS) identified in the Offset Area to be treated within 12 months of the commencement of the action</li> <li>■ Weed cover must not exceed 5% cover in the Offset Area for the duration of the offset.</li> <li>■ No new prohibited or restricted matters listed under the Biosecurity Act are identified at BioCondition assessments or monitoring sites (based on subsequent monitoring events), or opportunistically, i.e. if noted outside of BioCondition assessments or monitoring surveys.</li> </ul>
Monitoring	<ul style="list-style-type: none"> <li>■ Ecological monitoring (BioCondition assessments and species surveys) will be undertaken every five years until the completion criteria have been met. The completion criteria required are a habitat quality score of 8 for koala and 7 for greater glider in the Offset Area. Using the BioCondition benchmark, the target for completion is &gt;80% of the benchmark for regrowth areas and &gt;90% for current remnant areas in year 20.</li> <li>■ Reports will be submitted annually following photo monitoring events and after all other times that monitoring events occur (for example, species surveys), as required by the Annual Compliance Reporting under the EPBC Act approval.</li> <li>■ Management of the Offset Area must continue at least until all completion criteria have been met. If completion criteria are met, then monitoring frequency can be decreased, but not ceased. Monitoring must continue in order to detect if completion criteria are no longer being met, in which case, management actions and increased monitoring must resume.</li> </ul>
Reduction in current grazing density	<ul style="list-style-type: none"> <li>■ Increase the richness and average % cover from the baseline measured, of native perennial grasses, as measured at each habitat quality assessment site based on the results of baseline and subsequent BioCondition assessments and monitoring events.</li> </ul>



**Table 4-6 Interim Targets and Completion Criteria**

Protected matter	Eucalypt open forest (Koala)	Eucalypt open forest (Greater Glider)
<b>Offset Area details</b>		
<b>Impact area (IM)</b>	Up to 30 ha	
<b>Transect Site Reference</b>	Site 1, 2 & 6 (remnant) Site 5 and 3 (regrowth)	Site 1, 2 & 6 (remnant) Site 5 and 3 (regrowth)
<b>Offset Area (ha)</b>	137.9	137.9
<b>Habitat quality overall scoring</b>		
<b>Offset Area start quality</b>	7	6
<b>Offset Area habitat quality score Year 5</b>	7.0 – 7.25	6.0 – 6.25
<b>Offset Area habitat quality score Year 10</b>	7.25 – 7.5	6.25 – 6.5
<b>Offset Area habitat quality score Year 15</b>	7.5 – 8.0	6.5 – 7.0
<b>Offset Area habitat quality score Year 20</b>	8.0	7.0
<b>Large trees criteria (benchmark = 14 trees/ha)</b>		
<b>Start condition</b>	45% of benchmark (6 trees)	
<b>Year 5</b>	50% of benchmark (7 trees)	
<b>Year 10</b>	60% of benchmark (9 trees)	
<b>Year 15</b>	70% of benchmark (10 trees)	
<b>Year 20</b>	75% of benchmark (11 trees)	
<b>Tree canopy cover criteria (benchmark = 22% foliage projective cover)</b>		
<b>Start condition</b>	57% of benchmark (12% cover)	
<b>Year 5</b>	65% of benchmark (14% cover)	
<b>Year 10</b>	70% of benchmark (15% cover)	
<b>Year 15</b>	75% of benchmark (17% cover)	
<b>Year 20</b>	75% of benchmark (17% cover)	

## 4.4 Corrective Actions

This section outlines a general summary of the corrective actions proposed for each management action in Table 4-4. These are general corrective action triggers that where identified, will trigger the specific corrective actions.

Corrective actions will be implemented if certain criteria are not being achieved following the annual compliance monitoring periods and/or throughout the habitat quality inspections in the first three years (and every three years after that). These criteria will trigger corrective actions:

- Where WONS and pests are detected within the Offset Area, control procedures and the timing of monitoring and management measures will be increased and held at the increased rates until the completion criteria can be achieved;
- Where koala and greater glider habitat rehabilitation achieves a success rate below 90% in its 20 year period, regeneration and vegetation protection measures will be implemented until completion criteria can be met. Where there are any unplanned weather events (flooding, drought) or unplanned fires, any damage that is done to the Offset Area will be recorded in the habitat quality score. This habitat quality score will be compared to unaffected areas of the Offset Area (of the same previous quality), and then the area will be managed, particularly with respect to weed management, to ensure the completion criteria can be met for the affected area; and
- Post monitoring, where regrowth vegetation, survival of planting stock and recruitment of eucalypts does not meet the outlined completion criteria, supplementary planting will occur and will be monitored to ensure completion criteria can be met.

It is noted that these corrective actions are listed in Table 4-4 and also listed and elaborated on as part of the preventative measures in the risk analysis of Section 6.

## 5. MONITORING AND REPORTING

### 5.1 Monitoring Plan

The following monitoring program describes the monitoring activities that will occur within the Offset Area. The monitoring approach has been developed to assess success of the management actions to improve the overall biodiversity and habitat values for koala and greater glider in the Offset Area.

The following monitoring methodologies have been designed to measure the effectiveness of the management actions in improving and maintaining koala and greater glider habitat quality and to measure the progress towards the completion criteria.

The monitoring objectives directly relate to determining whether the environmental objectives are being achieved where there has been:

- Ecological gain and/or maintenance within the Offset Area, i.e. what are the habitat quality scores and is a gain being realised or is habitat quality deteriorating;
- WONS and pest animal activity reduction, successful management actions and subsequent benefit to koala and greater glider habitat; and
- Improvement in koala and greater glider habitat quality and if it has been maintained.

Further to this, management of the Offset Area must continue until completion criteria have been met. If completion criteria are met prior to the end of the 20 year period, then monitoring frequency can be decreased, but not ceased. Monitoring must continue in order to detect if completion criteria are no longer being met, in which case, management actions and increased monitoring must resume.

Monitoring will be undertaken by a suitably qualified person, depending on the methodology to be applied as part of the monitoring. The ecological monitoring described in Table 5-1 must be completed by a suitably qualified ecologist or vegetation management specialist, i.e. BioCondition assessments. The placement of permanent MHQA transects and photo monitoring locations will correspond to the same locations used for the calculation of the start habitat quality scoring used in the assessment of the Offset Area suitability. The quarterly monitoring associated with fire, grazing and pest species management can be completed by a suitability qualified and experienced land management specialist or representative of the approval holder.

In summary, monitoring actions are proposed at various frequencies, depending on the actions and metrics being measured. They are detailed in Table 5-1, with a summary of the actions and frequency including:

- 5 yearly MHQA transect sampling, i.e. BioCondition assessments;
- 5 yearly koala and greater glider targeted surveys;
- Annual photopoint monitoring; and
- Quarterly inspections for fire management, cattle grazing impacts and pest species management.

**Table 5-1 Monitoring Actions**

Management Action	Monitoring Actions
<b>Ecological monitoring</b>	
Threatened species habitat management	<p>Every five years a MHQA and Biocondition assessment, modified to include koala and greater glider specific habitat attributes, will be conducted in accordance with the <i>Biocondition Assessment Manual</i> (Eyre et al., 2015).</p> <p>14 field-based ecological condition indicators used in the MHQA will be monitored to track the effectiveness and success of the management plan for the koala and greater glider offset:</p> <ol style="list-style-type: none"> <li>1. Recruitment of woody perennial species – includes koala and greater glider canopy feed and shelter tree species.</li> <li>2. Native plant species richness (trees, shrubs and grasses) – as an indicator of ecological succession and regeneration progress after mitigating ecosystem threats.</li> <li>3. Tree canopy height – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>4. Tree canopy cover – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>5. Shrub canopy cover – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>6. Native perennial grass cover – which suppresses weeds and thereby encourages recruitment of juvenile eucalypt feed and shelter trees.</li> <li>7. Organic litter cover – important for surface soil moisture retention, cycling of nutrients and providing interstitial spaces to enhance tree seed germination and growth and recruitment of canopy species including actively-growing koala feed and shelter species.</li> <li>8. Large trees per hectare – as a measure of important as shelter trees for Koalas and the production of seeds for recruitment.</li> <li>9. Coarse woody debris per hectare – an increase relative to the benchmark could indicate a decline in canopy tree health / increase in senescence.</li> <li>10. Invasive plant cover – which can compete with native plants for light, moisture and nutrients, especially recruiting koala and greater glider food and shelter tree canopy species. Invasive plants can increase fuel load and change fire regimes and susceptibility to unplanned fires.</li> <li>11. Quality and availability of food and foraging – e.g. number, size and health of feed trees.</li> <li>12. Quality and availability of shelter – e.g. density and health of shelter trees.</li> <li>13. Threats to species – e.g. feral dog/fox/pig activity and the documented number of culled dogs.</li> <li>14. Hollow trees size and number per hectare – as a measure important as shelter trees for greater glider.</li> </ol> <p>These attributes will be input into the MHQA to assess the progress of the Offset Area towards the completion criteria. The location of the monitoring transects are shown in Figure 5-1 and correspond with the same location where MHQA transects were positioned to measure the start habitat quality score of the offset area.</p> <p>In addition to collection of BioCondition plot data, searches for hollow-bearing trees, koala scats, and scratch marks on trees will be conducted to assess for evidence of usage of the site by greater glider and koala.</p>
Targeted surveys for Koala and Greater Glider	<p>Every five years targeted surveys for the koala and greater glider will be undertaken in accordance with the relevant survey guidelines (Survey guidelines for Australia's threatened mammals (DSEWPC 2011), EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DoE 2014)). This will outline information relating to:</p> <ul style="list-style-type: none"> <li>■ Presence of koalas in Offset Area, including estimated numbers and location of sightings, scratch marks or scats,</li> <li>■ Presence of greater glider in Offset Area, including estimated numbers and location of sightings.</li> </ul>

Management Action	Monitoring Actions
<b>Quarterly landholder/approval holder records and monitoring (report to approval holder end of each quarter, documented in an annual report)</b>	
Fire management	Monitoring requirements will include monitoring and annual reporting of access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of reduced intensity of livestock.
Grazing management	Where areas within the Offset Area are allowed to be grazed, this should be monitored monthly during grazing times to ensure there is no grazing pressure or disturbance affecting areas offset for koala and greater glider habitat. Stocking rates are also to be recorded in the months where the Offset Area is to be used for grazing. Inspections of the property boundary fence will be conducted quarterly by the landowner. Any damage to the fence that may allow vehicles or stock to enter outside of the parameters outlined in this OAMP will be repaired as soon as practical.
Native vegetation management	Permanent survey transects will be established at the baseline survey points as per the ecology report (ERM, 2021a) this is denoted in Figure 5-1. Photo point monitoring is to be undertaken annually at the same time of the year. The photos provide the baseline imagery to compare future photo point monitoring . A record of the photos will be maintained which includes: <ul style="list-style-type: none"> <li>■ GPS co-ordinates of the photo point.</li> <li>■ Date, time and number of each photo.</li> <li>■ Direction in which the photo was taken (north, south, east and west).</li> <li>■ After each monitoring event, a GPS waypoint of the location of the habitat and a polyline extent will be recorded. The following elements will be noted on a field datasheet: <ul style="list-style-type: none"> <li>■ The presence of weeds within the Offset Area.</li> <li>■ Natural regeneration of native species; and</li> <li>■ Establishment of planting stock</li> </ul> </li> </ul>
Integrated pest animal control	Animal management and monitoring will be undertaken in accordance with the <i>Biosecurity Act 2014</i> (Qld). This requires that reasonable and practical steps be taken to prevent or minimise biosecurity risks; minimise the likelihood of causing a 'biosecurity event'; and the limitation of consequences if such an event is caused. The control of pest animals will be undertaken using legal methods, and consistent with existing control campaigns (adjacent to wild dog fence). Quarterly monitoring and annual reporting will be undertaken in accordance with the existing control programs.
Integrated weed management and control of WONS	The presence of WONS and other invasive weeds will be monitored quarterly and reported annually, commencing within the first 12 months of the OAMP being approved. The monitoring will be undertaken during the same time of year, each year, to ensure that the timing is consistent and aligns with the baseline assessment. The following procedures will be implemented to ensure that the annual monitoring event aligns with the baseline monitoring methodology: <ul style="list-style-type: none"> <li>■ GPS locate the presence of weeds either via a GPS waypoint, or where large infestation is present, create a GPS polyline and walk the extent of the infestation.</li> <li>■ On a field datasheet, detailing the time of year of the monitoring event, list of observed WONS, photo location and direction and notes of any notable positive and/or negative changes in weed density and coverage.</li> <li>■ Weed monitoring should also be informed by the previous year's weed survey mapping, field datasheet and photos for noting changes in weed infestations and densities.</li> <li>■ Transfer GPS data to the necessary programs to generate weed survey mapping extent and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring purposes.</li> </ul>

### 5.1.1 Population Surveys

Koala Spot Assessment Technique (SAT) surveys will be carried out as part of the 5-yearly monitoring events to determine population numbers within the Offset Area. SAT surveys will be undertaken as per the *EPBC Act referral guidelines for the vulnerable koala* (DoE, 2014).

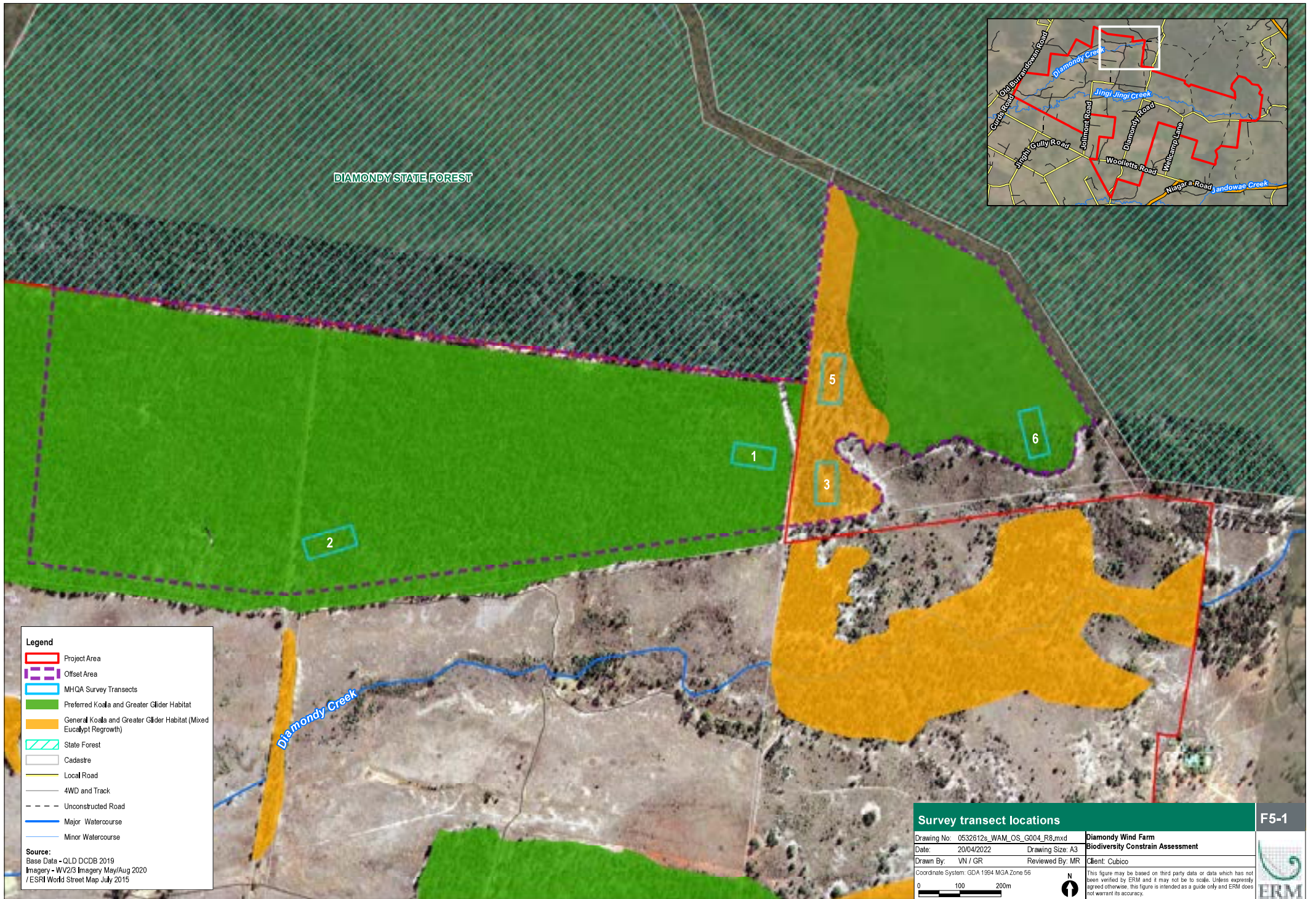
Greater glider surveys will be carried out as part of the 5-yearly monitoring events to determine population numbers within the Offset Area. Surveys for this species has no specific survey guidelines, however the following survey methodologies will be referred to for detection of this species:

- *Survey guidelines for Australia's threatened mammals* (DSEWPC, 2012b); and
- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (DES, 2018).

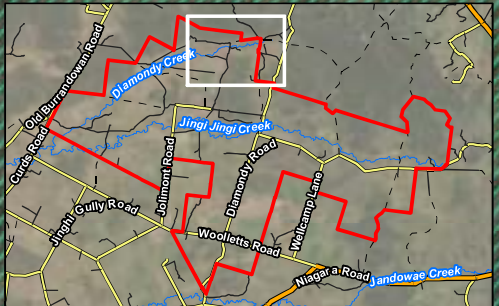
Monitoring surveys for greater glider will include a targeted search for all potential den trees, containing suitable size hollows. This will include collection of the data on the location, tree species, tree trunk diameter (DBH) and hollow opening size. The total number of suitable den trees within the offset area will be recorded at each of the 5-yearly monitoring events by completing walked transects across the Offset Area and mapping the location of each tree.

### 5.1.2 Habitat Transect Survey (BioCondition Assessment Methodology)

BioCondition assessments, in accordance with the methodology in the Biocondition Assessment Manual (Eyre et al., 2015), will be conducted to ascertain the baseline data for the Offset Area. BioCondition assessments will also be modified to include surveys for suitable hollows (in trees >20cm DBH) included for greater gliders. BioCondition assessments will be undertaken in chosen locations in the Offset Areas as denoted in Figure 5-1 below, to be determined within the first 12 months of the OAMP's approval.



DIAMONDY STATE FOREST



**Legend**

- Project Area
- Offset Area
- MHQA Survey Transects
- Preferred Koala and Greater Glider Habitat
- General Koala and Greater Glider Habitat (Mixed Eucalypt Regrowth)
- State Forest
- Cadastre
- Local Road
- 4WD and Track
- Unconstructed Road
- Major Watercourse
- Minor Watercourse

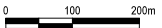
Source:  
 Base Data - QLD DCDB 2019  
 Imagery - WV2/3 Imagery May/Aug 2020  
 / ESRI World Street Map July 2015

**Survey transect locations**

Drawing No: 0532612s\_WAM\_OS\_G004\_R8.mxd  
 Date: 20/04/2022  
 Drawing Size: A3  
 Drawn By: VN / GR  
 Reviewed By: MR

**Diamondy Wind Farm**  
**Biodiversity Constraint Assessment**  
 Client: Cubico

Coordinate System: GDA 1994 MGA Zone 56



This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

F5-1



## 5.2 Reporting and OAMP Review

An annual compliance report will be prepared and submitted to DAWE by the approval holder, reporting on compliance with all approval conditions under the EPBC Act. The report will document any incident reports of undesirable impacts on koalas and greater gliders, and any monitoring and management milestones, including tracking of progress towards the required performance and completion criteria (Table 4-6), achieved that occurred during the previous 12 months, including progress on key management and implementation of management actions. The annual report will provide an update on activities and monitoring of fire, grazing, native vegetation, weeds and pests.

Suitably qualified ecologists/appropriate experts will be engaged to conduct ecological monitoring (including targeted surveys and BioCondition assessments). Reports will be submitted to the approval holder every 5 years, and the approval holder will include a summary of findings as part of the required Annual Compliance Report.

This plan will be implemented until the impacts for the duration of the impact have been averted, which has been calculated as 20 years. Management actions will be reported on in the annual reporting, and adapted where required, if triggers are reached and corrective actions are required to be implemented. If management actions need substantial adjustment, this OAMP may be reviewed in consultation with the landholder, a senior ecologist and/or a senior land management specialist (with over 10 years relevant expertise and knowledge) and submitted as per the conditions that relate to variations of the OAMP.

Reports will be coordinated and reviewed by a suitably qualified ecologist, with technical review and quality assurance processes followed so that robust reporting on the offset progress is documented. The reports will be prepared to follow appropriate documentation standards for the communication of monitoring data, with the following applied to each monitoring report:

- Include EPBC Act approval number and project name;
- Include CVs and experience of all personnel involved in monitoring and preparation of report;
- Revision history and signature page of all reviewers;
- Scale in figures and maps– an appropriate standard metric scale should be chosen to best represent the information required for the location of monitoring plots and any spatial information;
- Datum – plans and cross sections should refer to Australian Height Datum; and
- All relevant figures and maps will include a title block – plans should have a title block in the lower right hand corner of the sheet with the following information:
  - EPBC number and project name;
  - title and number of the plan;
  - author;
  - scale;
  - date; and
  - source and date of data.



## 6. RISK ANALYSIS

A risk analysis (qualitative) has been carried out for the proposed Offset Area for the Project. The risk assessment assesses the risk of failure for the Offset Area to reach its environmental objectives and completion criteria. The risk analysis has been undertaken in accordance with the Commonwealths Environmental Management Plan Guidelines (DoE, 2014) and has characterised the risks as minor, moderate, high, major and critical. This is a result of assessing the likelihood of and consequence of each of the events that present a risk to the Offset Area. The tables for the likelihood and consequence criteria, as well as the risk rating outcome table, are presented below.

The risk assessment is presented in Table 6-4.

**Table 6-1 Risk Likelihood**

Likelihood	Description
<b>Highly Likely</b>	It is expected to occur in most circumstances
<b>Likely</b>	Will probably occur during the life of the Project
<b>Possible</b>	Might occur during the life of the Project
<b>Unlikely</b>	Could occur but considered unlikely or doubtful
<b>Rare</b>	May occur in exceptional circumstances

**Table 6-2 Risk Consequence**

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

**Table 6-3 Risk Matrix**

Likelihood	Consequence				
	Minor	Moderate	High	Major	Critical
<b>Highly Likely</b>	Medium	High	High	Severe	Severe
<b>Likely</b>	Low	Medium	High	High	Severe
<b>Possible</b>	Low	Medium	Medium	High	Severe
<b>Unlikely</b>	Low	Low	Medium	High	High
<b>Rare</b>	Low	Low	Low	Medium	High

**Table 6-4 Risk Analysis**

Risk Event	Likelihood	Consequence	Risk Level	Event Trigger	Preventative measures	Related Monitoring Activity
Regrowth, survival of seedlings and recruitment of trees not occurring or occurring to a lesser extent than anticipated/required	Possible	High	Medium	Unsuccessful regrowth vegetation improvement and development of hollows. Denoted by failing to achieve RE benchmarks, or progress towards benchmarks, or interim or final completion criteria, upon 5-yearly monitoring events.	Determine cause of recruitment and survival of regrowth areas not occurring or occurring to a lesser extent than anticipated. Stocking rates to be reduced by 40-60% on current rates (1/5ha). Stocking rates to be reduced further for short-term time periods (6 months-1 year). Potential increases in monitoring to control invasive flora/fauna.	5 yearly monitoring through the BioCondition assessment methodology
Increases in the presence of invasive flora species and/or WONS within the Offset Area (infestations)	Unlikely	Minor	Low	Vegetation condition and habitat quality within the Offset Area declines from the presence of invasive plant species and/or WONS. Habitat quality score is not increasing after 5 years as a result of invasive flora species.	Determine cause of infestation and prevent further outbreaks if possible. Removal of weed species per the management program where possible. Updates to management actions where appropriate to decrease weed outbreaks.	Annual invasive flora monitoring events
Increases in the presence of invasive fauna species within the Offset Area	Unlikely	Minor	Low	Predation of threatened and native species, and declines of habitat quality within the Offset Area from the presence of invasive fauna species. Habitat quality score is not increasing after 5 years as a result of invasive fauna species.	Determine the cause of pest increases and prevent further increases if possible. Review and update management measures to ensure their effectiveness in management invasive fauna. Potential increases in monitoring to control invasive fauna.	Annual/event based invasive fauna monitoring events

Risk Event	Likelihood	Consequence	Risk Level	Event Trigger	Preventative measures	Related Monitoring Activity
Wildfires, inappropriate burning regimes, and weed accumulation leading to risk of wildfire.	Possible	High	Medium	Unplanned fires resulting in damage to vegetation condition and habitat quality.	Fire environmental objectives such as the removal of high fuel loads as well as the management of invasive plant species will work to ensure that any unplanned burns have minimal to low impacts on the Offset Area, should an unplanned fire occur.  If a fire is to occur, when safe to do so, the Offset Area will be visited and environmental objectives and monitoring plans updated where appropriate.	Three yearly cool burns/management events (reduction in fuel loads)
Decline of vegetation condition and habitat quality within the Offset Area (as a result of human activities such as logging, high density grazing, unauthorised access).	Possible	Minor	Low	Unauthorised selective logging of mature trees or unauthorised clearing of regrowth vegetation within the Offset Area.  Evidence of degradation to native vegetation with the Offset Area.  Unsuccessful regrowth vegetation improvement and development of hollows.  Denoted by failing to achieve benchmarks, or progress towards benchmarks, or interim or final completion criteria, upon 5-yearly monitoring events.	Logging is excluded from within the Offset Area.  If logging is noted during monitoring activities, landholder consultations will be undertaken.  Potential increases in monitoring events to occur to control potential unauthorised access issues.  Stocking rates to be reduced by 40-60% on current rates (1/5ha).	5 yearly monitoring through the BioCondition assessment methodology.  Inspections of access gates to the property

Risk Event	Likelihood	Consequence	Risk Level	Event Trigger	Preventative measures	Related Monitoring Activity
Interim targets not able to be met and/or final completion criteria not met in 20 years	Unlikely	High	Medium	Interim targets not met in specified timeframes and/or final completion criteria not met at 20 years (see Table 4-6)	<p>Intensification of management actions, such as weed reduction, number of new plantings, and extension of timeframes to meet final completion criteria.</p> <p>Source additional offset to make up any shortfall in full conservation benefit to koala and greater glider.</p> <p>Revise Offset Area Management Plan and submit to the Commonwealth Minister for the Environment for approval.</p>	<p>Annual monitoring of vegetation condition and habitat quality within the Offset Area.</p> <p>Annual surveys for koalas and greater gliders, including required habitat features, e.g. food trees, hollows, etc.</p> <p>Monitoring of new plantings once every 6 months to ensure establishment and record survival for first 12 months-2 years.</p>

## 7. LEGALLY SECURED OFFSET AREA DETAILS

Under Queensland legislation, the following legal security mechanisms exist for offsetting impacts to the terrestrial environments:

- An environmental offset protection area under section 30 of the *Environmental Offsets Act 2014*;
- An area declared as an area of high nature conservation value under Section 19F of the *Vegetation Management Act 1999*, where it is secured for the purposes of an environmental offset;
- An area declared as a nature refuge under section 46 of the *Nature Conservation Act 1992*, where it is secured for the purposes of an environmental offset;
- An area declared as a protected area under section 29(1) of the *Nature Conservation Act 1992*, where it is secured for the purposes of an environmental offset; or
- An area secured as a statutory covenant for environmental purposes under the *Land Act 1994* or *Land Title Act 1994*.

Legal securement of the Offset Area for this Project will be obtained via a voluntary declaration per Section 19F of the VM Act. The Offset Area will be secured upon the approval of this OAMP and within 9 months of commencement of the action. A Voluntary Declaration will be registered on the property title and the Offset Area will be mapped as a Category A area on the Property Map of Assessable Vegetation (PMAV). A Category A area on a PMAV is described as an “Area subject to compliance notices, offsets and voluntary declarations”. The Voluntary Declaration will provide enduring protection against development incompatible with conservation.

It should be noted that, within the Offset Area there is an easement utilised for vehicle movements. This easement is a DTMR parcel and from a regulatory perspective cannot be protected under the legally protected Offset Area mechanism (VDEC). However, management of the easement is the responsibility of the landholder and a commitment will be made under this OAMP that the vegetation that is within the easement will remain.

### 7.1 Duty of Care Requirements

The approval holder is accountable for the financial investment in the offset and the implementation of the OAMP. Completion of the actions will be recorded through the Annual Compliance Reporting requirements as a condition of the EPBC Act approval. This annual reporting will reference the completion criteria (Table 4-6) to ensure that the Offset Area is producing the required progress towards the interim targets and completion criteria. The approval holder will coordinate reporting, reviewing, inspections, auditing and any adaptive management changes to the OAMP, including any revision and submission for approval of the OAMP. A nominated person will be assigned the responsibilities of managing offset requirements for the approval holder.

The approval holder will enter into an arrangement with the landowner to undertake the management actions and day to day management of the site, including fencing, managing firebreaks, weed and feral animal management and grazing management.

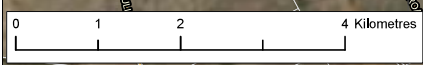
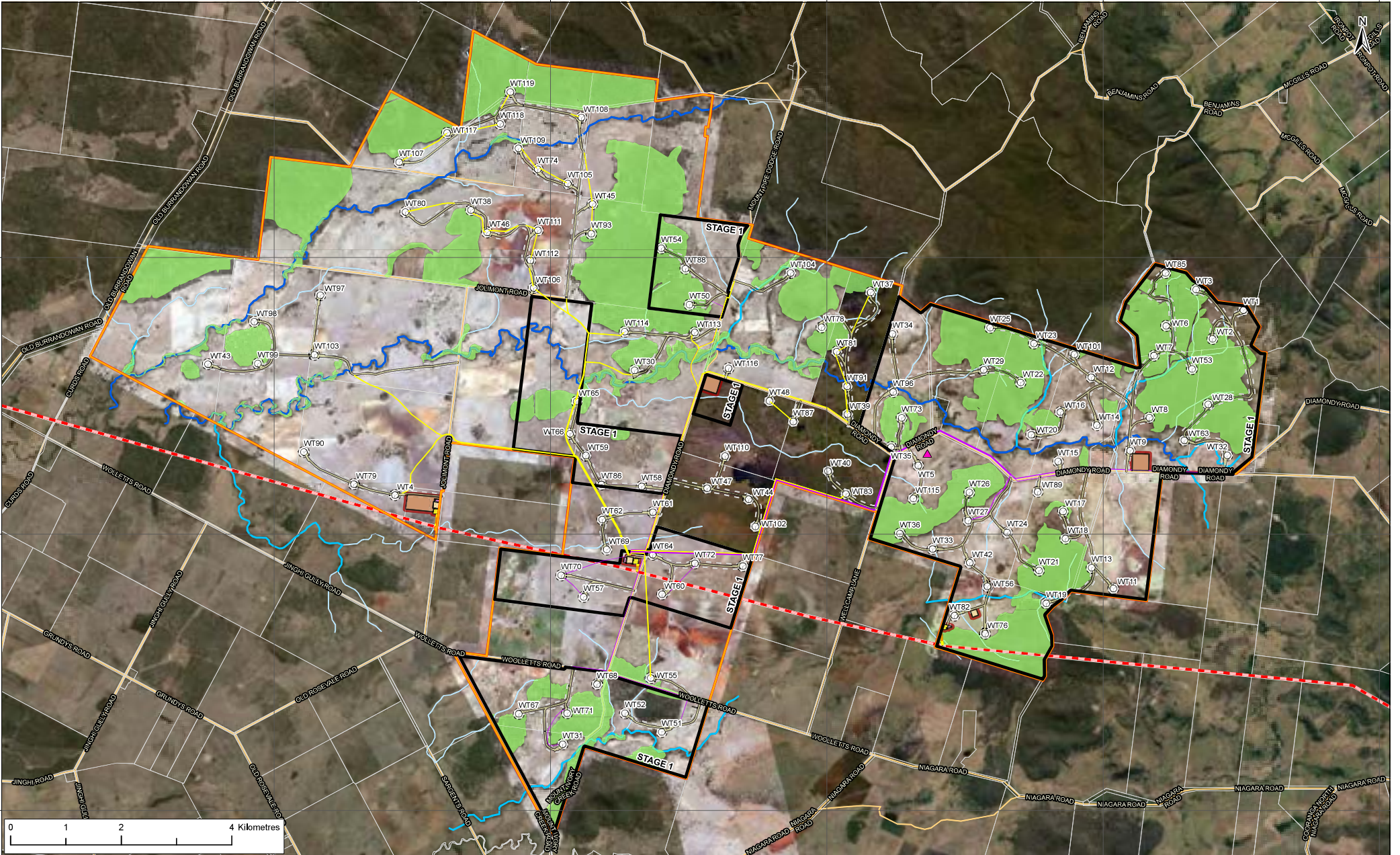
The approval holder will engage suitably qualified persons to undertake the MHQA assessments (BioCondition assessments), ecological studies, koala and greater glider surveys, prepare reports and undertake inspections, as required.

Incidents identified on site will be reported to the approval holder. The level of severity will dictate the necessary actions and responses through the approval holder’s formal incident management system. General incidents, for example, feral dog incursion, will be managed by the landowner. Responses to incidents adversely impacting habitat quality within the Offset Area, or koalas and greater gliders directly, will be coordinated by the approval holder, to ensure remediation or enhanced management measures are implemented to address the incident as soon as reasonably possible.

## 8. REFERENCES

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## **APPENDIX A      DETAILED HABITAT MAPS**



Disclaimer:  
While Wind Project No 1 Pty Ltd and Ouburn Sustainable Investments, Australia Pty Ltd make no warranty in relation to the accuracy, reliability, completeness or suitability of the data and does not accept liability for any loss, damage or costs, including consequential damage, in relation to any use of the data in this map.

- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- WTG 100m buffer (micrositing and indirect impacts)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
- ▲ Met mast location
- Construction compound & laydown area (stage 1 & 2 shared area)
- O & M facility (stage 1 & 2 shared area)
- Substation (stage 1 & 2 shared area)
- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3



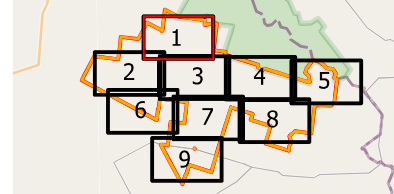
<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>Figure C1: Detailed Habitat Maps</b>			
<b>Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:65,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 Habitats Detailed	REV	02A
PRODUCED	I.Mackey		APPROVED
		M.Rockwood	





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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- Turbine hardstand (0,945ha)
- Turbine hardstand (1,6ha)
- WTG 100m buffer (micrositing and indirect impacts)
- Met mast location
- Construction compound & laydown area (stage 1 & 2 shared area)
- O & M facility (stage 1 & 2 shared area)
- Substation (stage 1 & 2 shared area)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

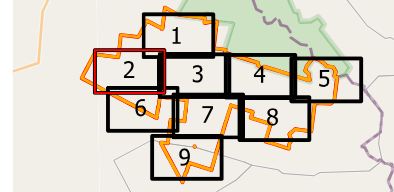


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.1: Greater Glider Habitat</b>			
PROJECT	DATE	STATUS	PRODUCED
	14/07/2021	IFU	I.Mackey
SCALE	DATUM	APPROVED	
1:15,000 @ A3	GDA 1994 MGA Zone 56	M.Rookwood	
FILE	REV		
WMWF_0035_02A 110 DDPages Glider	02A		

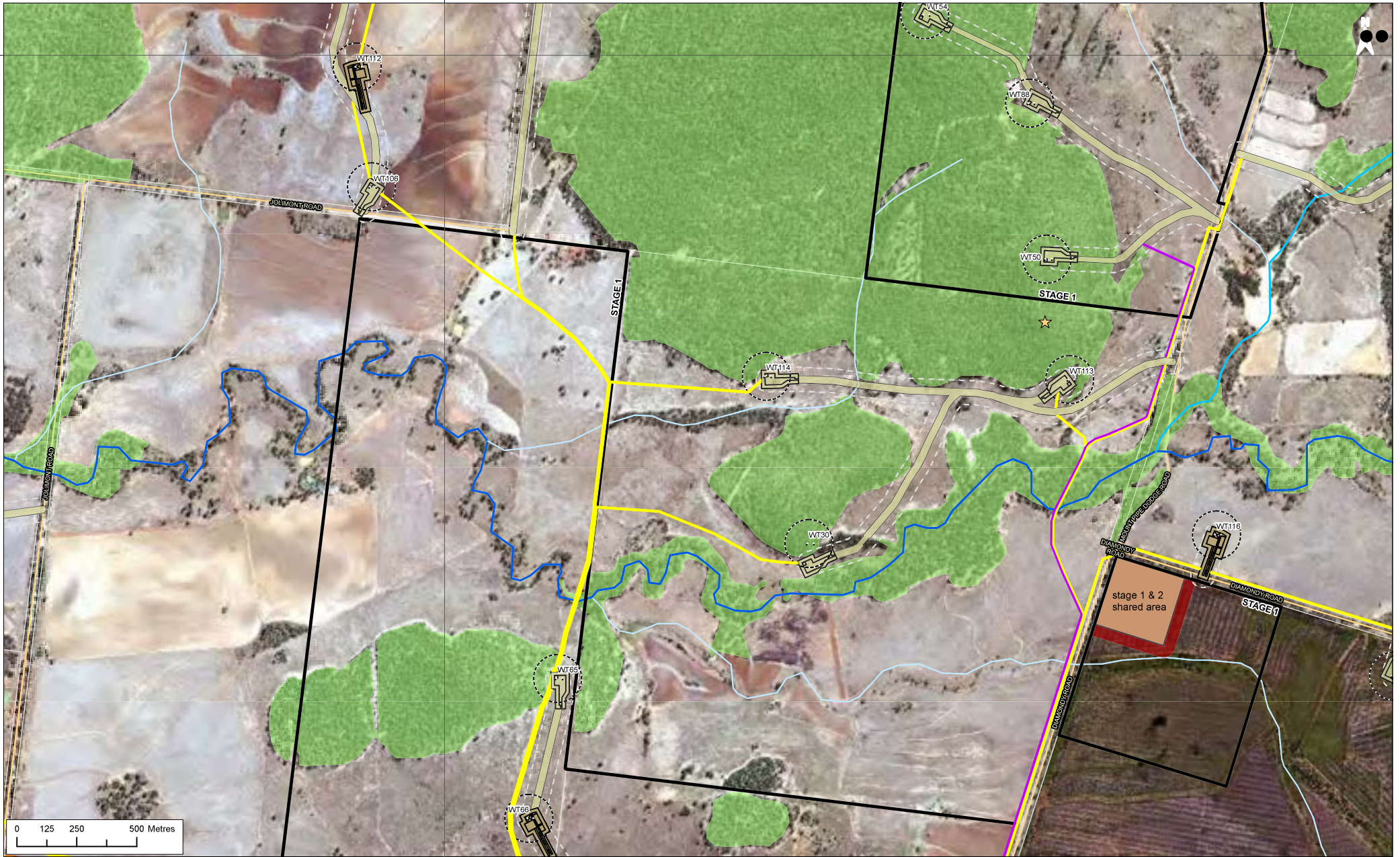


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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- Turbine hardstand (0,945ha)
- Turbine hardstand (1,6ha)
- WTG 100m buffer (micrositing and indirect impacts)
- Met mast location
- Construction compound & laydown area (stage 1 & 2 shared area)
- O & M facility (stage 1 & 2 shared area)
- Substation (stage 1 & 2 shared area)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3



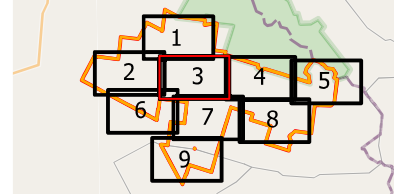
<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.2: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GD A 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	APPROVED	M,Rookwood
		REV	02A
		PRODUCED	I.Mackey



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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
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- WTG 100m buffer (micrositing and indirect impacts)
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- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary

- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

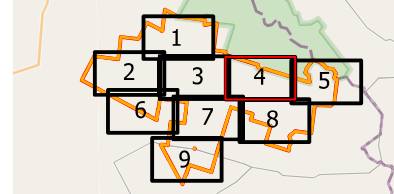


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.3: Greater Glider Habitat</b>			
PROJECT	DATE	STATUS	PRODUCED
	14/07/2021	IFU	I.Mackey
SCALE	DATUM	APPROVED	
1:15,000 @ A3	GDA 1994 MGA Zone 56	M.Rookwood	
FILE	REV		
WMWF_0035_02A 110 DDPages Glider	02A		



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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- Turbine hardstand (0,945ha)
- Turbine hardstand (1,6ha)
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- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

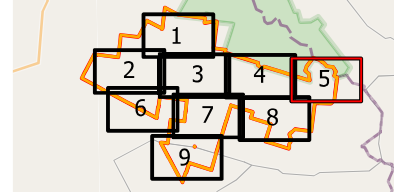


<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.4: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GD A 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	PRODUCED	I Mackey
		APPROVED	M Rookwood
		REV	02A



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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- Turbine hardstand (0,945ha)
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- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

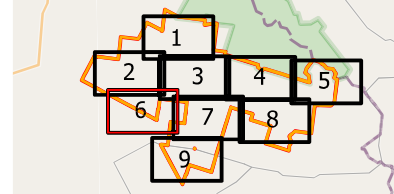


<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.5: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	APPROVED	M,Rookwood
		PRODUCED	I,Mackey
		REV	02A

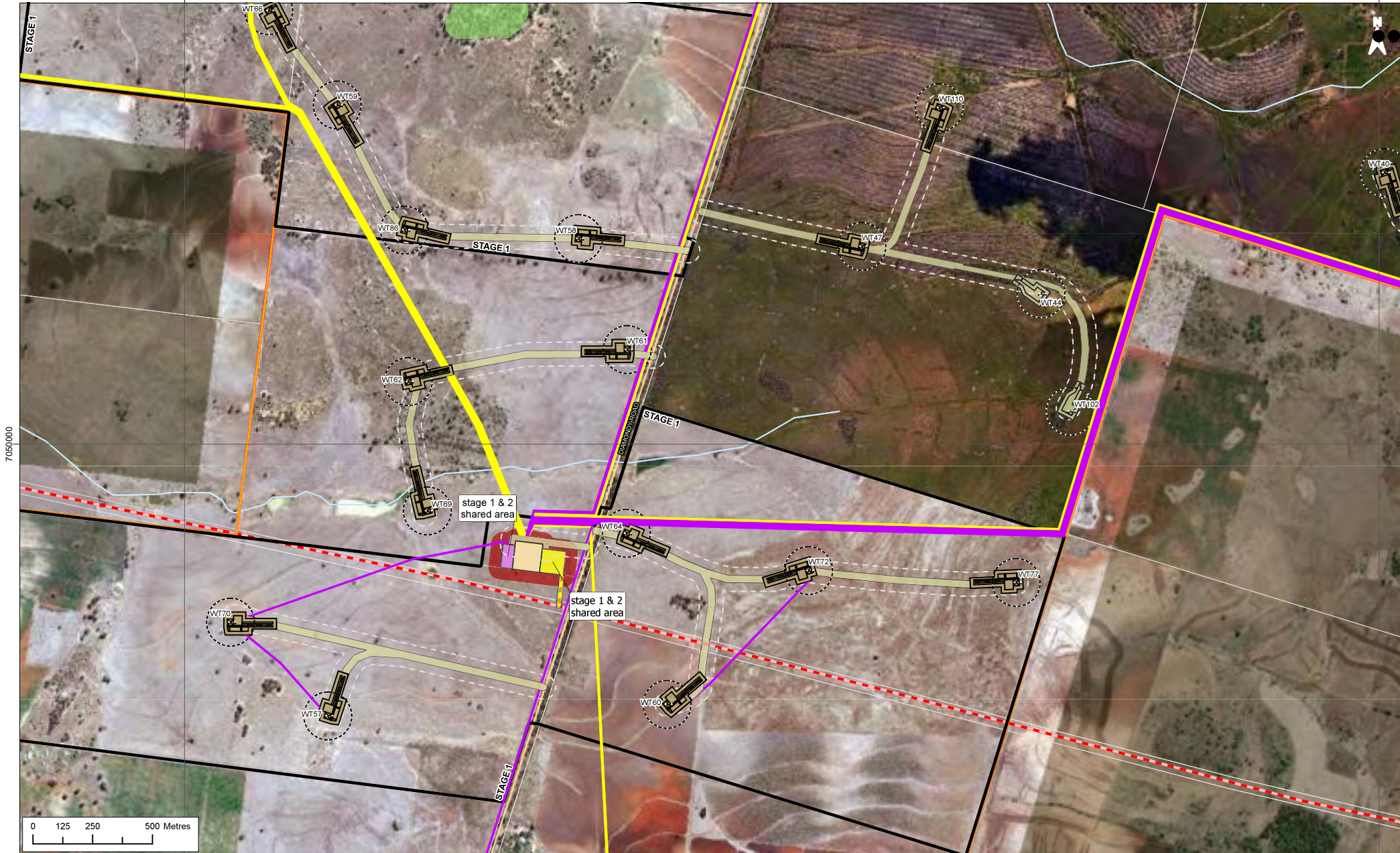


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- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- ★ Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

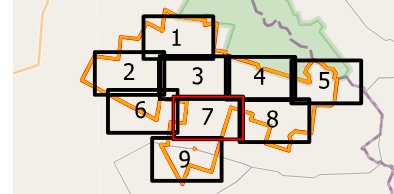


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.6: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	APPROVED	M,Rookwood
		REV	02A
		PRODUCED	I.Mackey

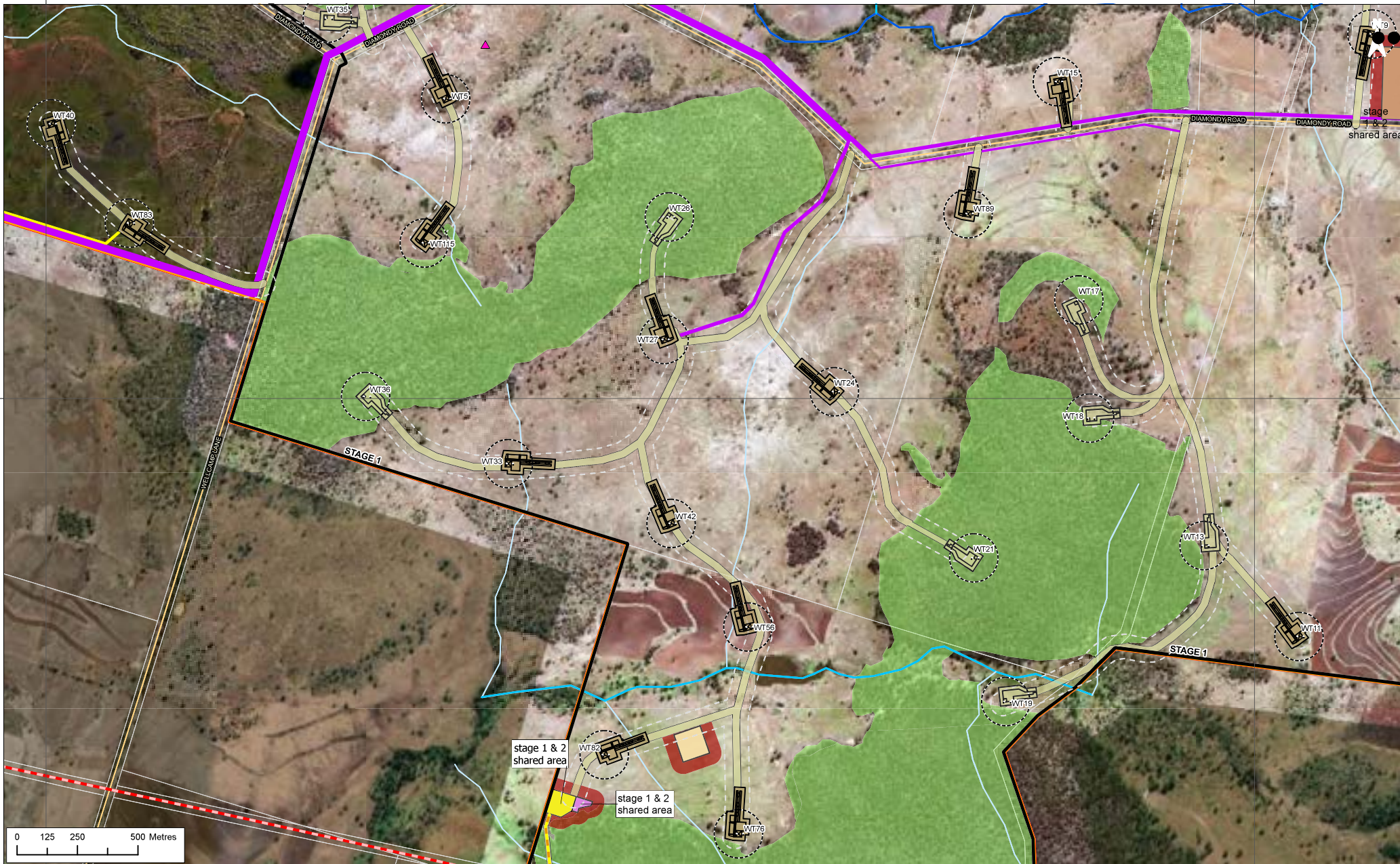


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- Grid connection line
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- Existing 132kV powerline
- ★ Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

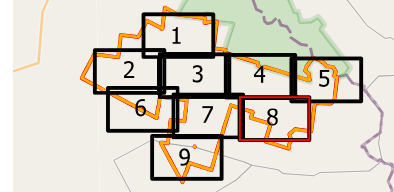


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.7: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	APPROVED	M,Rookwood
		PRODUCED	I,Mackey
		REV	02A



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- Existing 132kV powerline
- ★ Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3



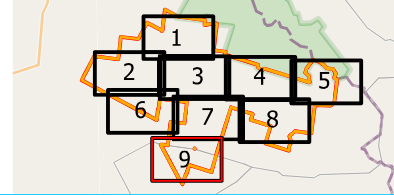
<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1.8: Greater Glider Habitat</b>			
PROJECT	DATE	STATUS	PRODUCED
	14/07/2021	IFU	I.Mackey
SCALE	DATUM	APPROVED	
1:15,000 @ A3	GDA 1994 MGA Zone 56	M.Rookwood	
FILE	REV		
WMWF_0035_02A 110 DDPages Glider	02A		



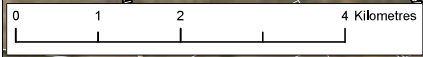
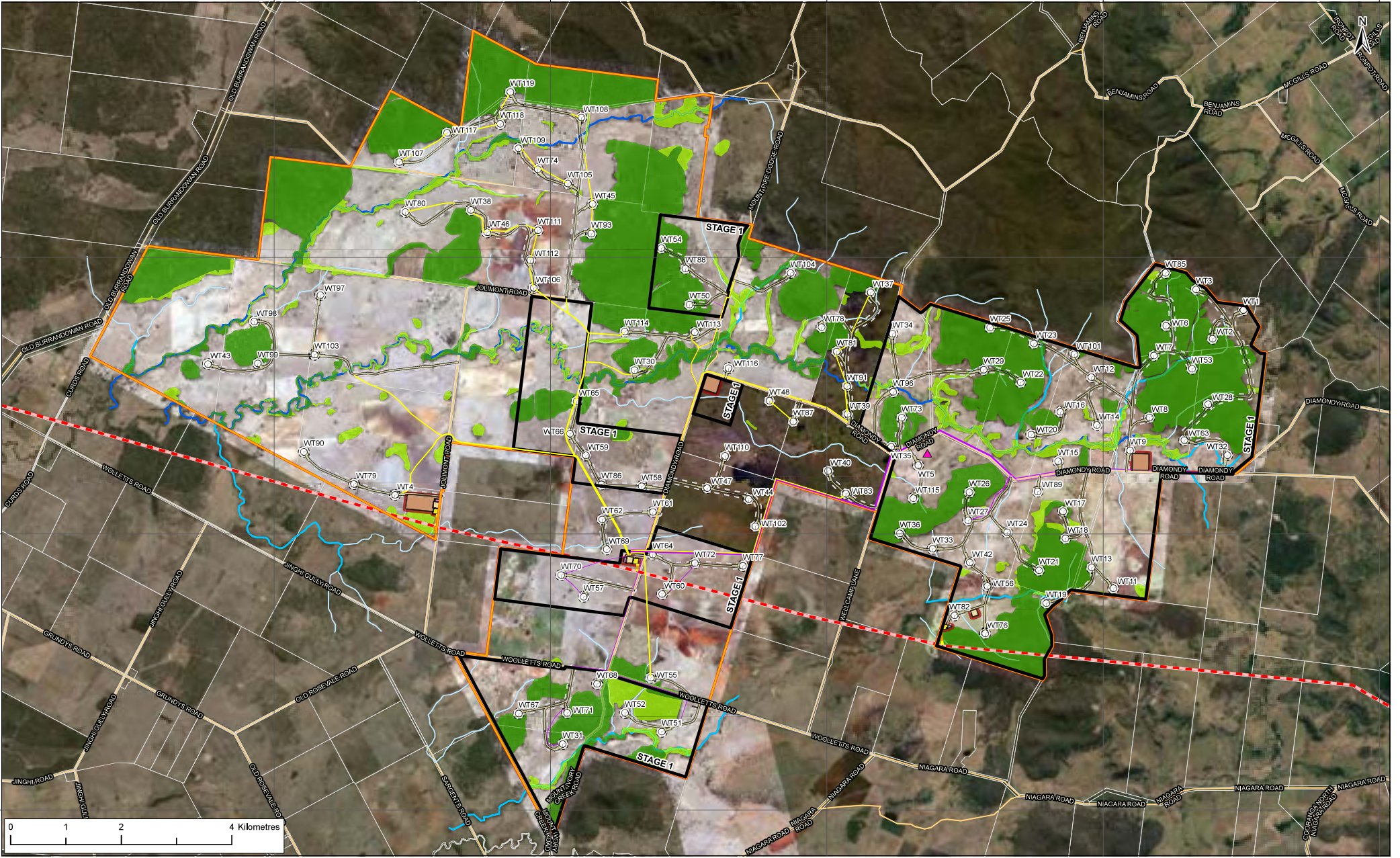


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- Greater glider
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- Turbine hardstand (0,945ha)
- Turbine hardstand (1,6ha)
- WTG 100m buffer (micrositing and indirect impacts)
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- Grid connection line
- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

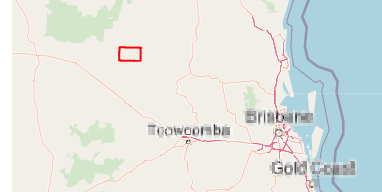


<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C1.1-1-9: Greater Glider Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Glider	APPROVED	M,Rookwood
		PRODUCED	I,Mackey
		REV	02A



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- Koala habitat (remnant)
- Koala habitat (koala regrowth)
- Project boundary
- Stage 1 area
- Wind turbine (x110)
- WTG 100m buffer (micrositing and indirect impacts)
- Access track and turbine hardstand (direct impact)
- Access track 100m corridor (indirect impact)
- Stage 1 Cable Corridors
- Stage 2 Cable Corridors
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- Existing 132kV powerline
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

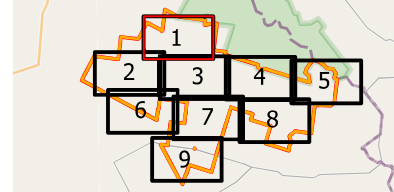


<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>Figure C2: Detailed Habitat Maps</b>			
<b>Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:65,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 Habitats Detailed	REV	02A
PRODUCED	I Mackey	APPROVED	M Rockwood



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- Cultural heritage site
- Cadastral boundary
- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3



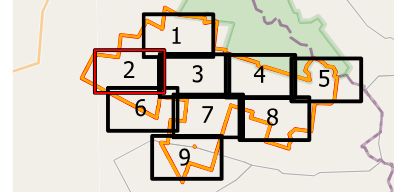
<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.1: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koala	PRODUCED	I.Mackey
		APPROVED	M.Rookwood
		REV	02A



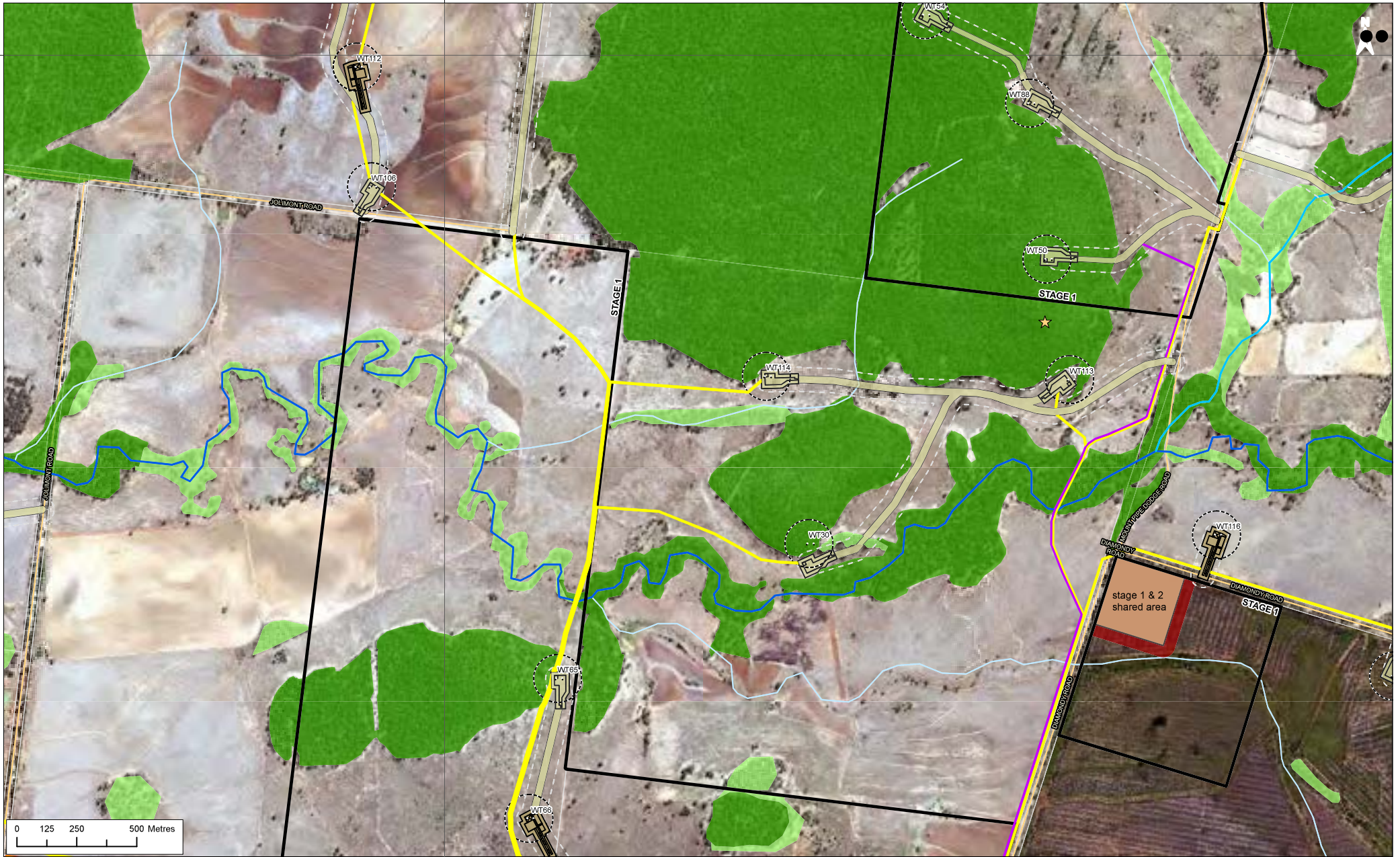
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- Cadastral boundary

- Waterways**
- Stream order 1
- Stream order 2
- Stream order 3

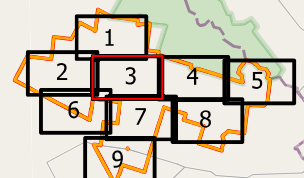


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.2: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GD A 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koals	REV	02A
PRODUCED	I.Mackey		APPROVED
		M.Rookwood	



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- Waterways**
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  - Stream order 3

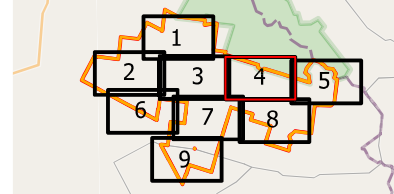


<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.3: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koala	REV	02A
PRODUCED	I.Mackey		APPROVED
		M.Rookwood	



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<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.4: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
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PRODUCED	I.Mackey		APPROVED
		M.Rookwood	

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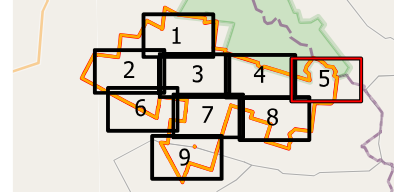
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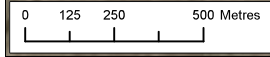
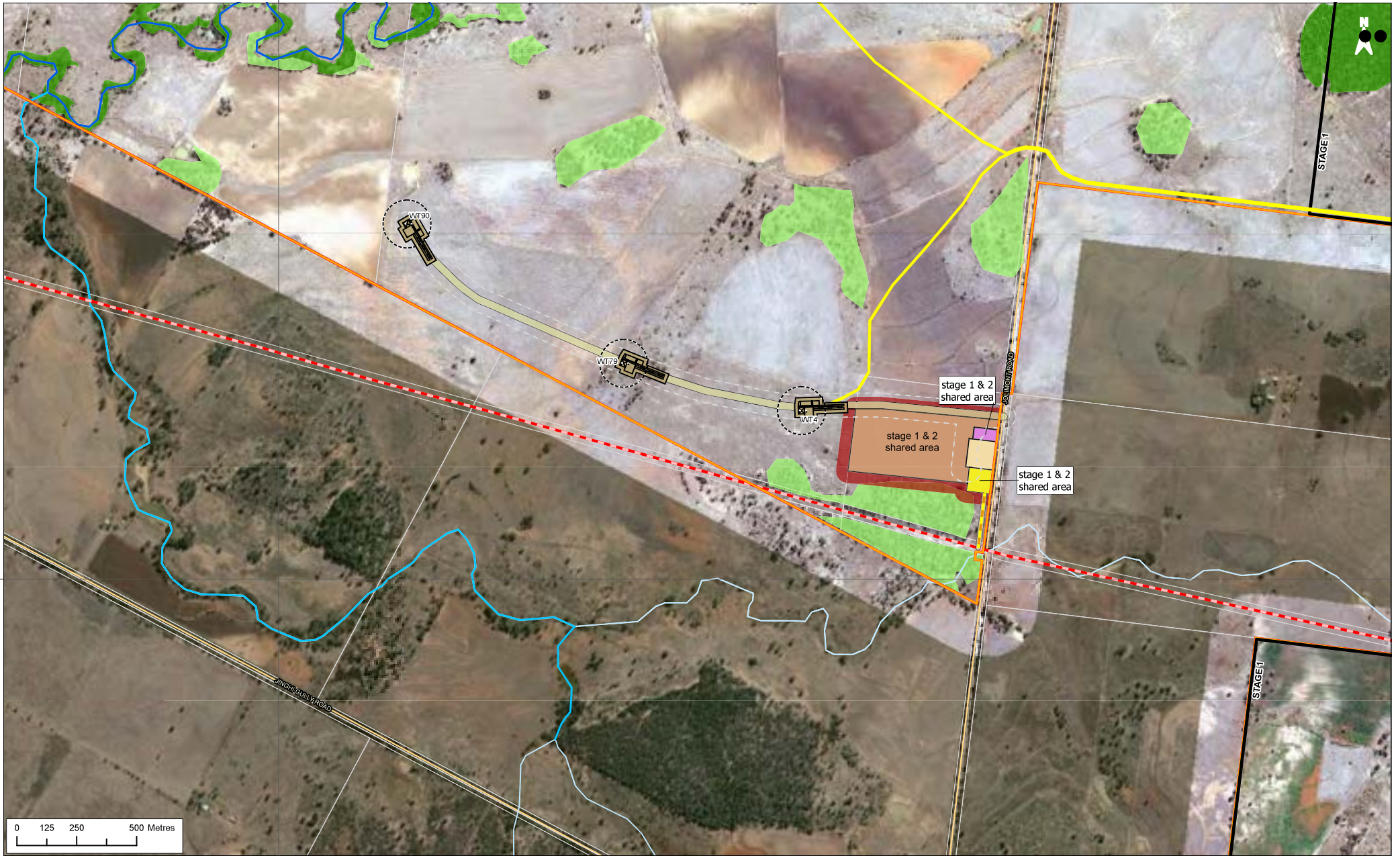


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- Battery storage (BESS)
- Facility 50m buffer (micrositing and indirect impacts)
- Existing 132kV powerline
- Cultural heritage site
- Cadastral boundary

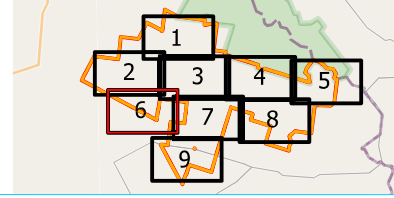


<b>PROJECT</b>			
<b>Wambo Wind Farm</b>			
<b>TITLE</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.5: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koala	REV	02A
PRODUCED	I.Mackey		APPROVED
		M.Rookwood	



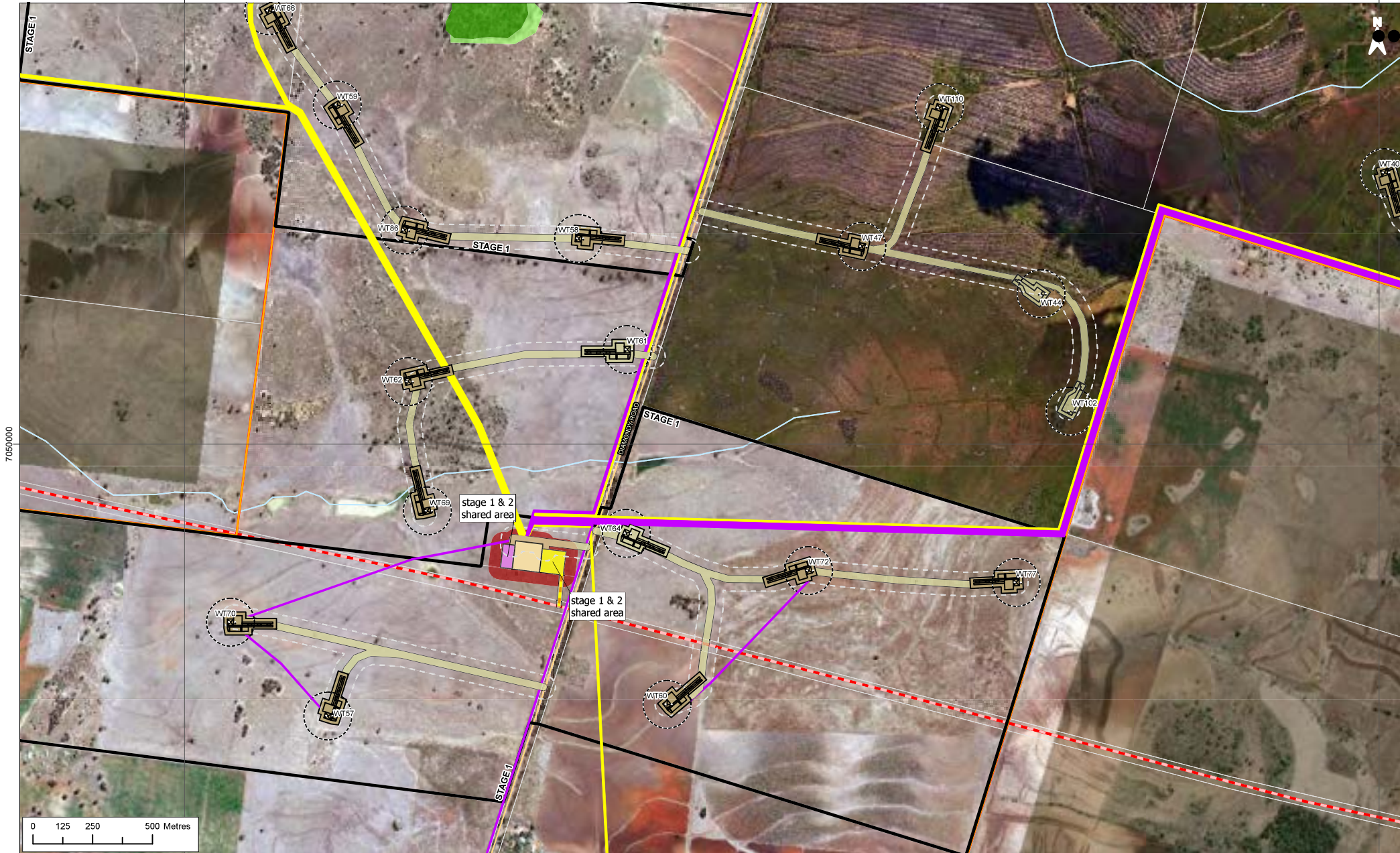
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- Waterways**
- Stream order 1
  - Stream order 2
  - Stream order 3



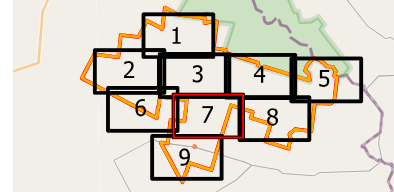
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<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.6: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koals	APPROVED	M.Rookwood
		REV	02A
		PRODUCED	I.Mackey





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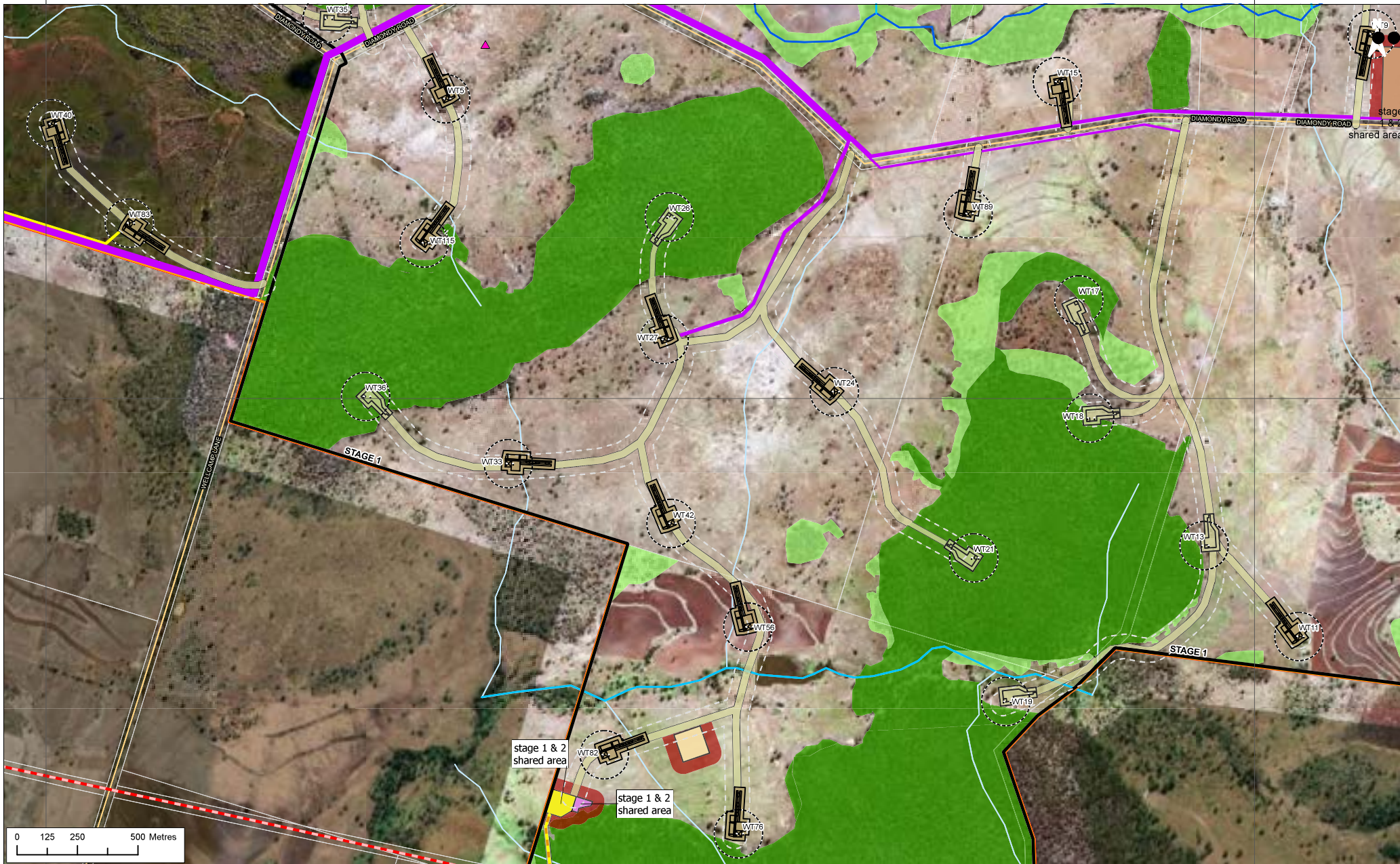
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<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.7: Koala Habitat</b>			
DATE	14/07/2021	STATUS	IFU
SCALE	1:15,000 @ A3	DATUM	GDA 1994 MGA Zone 56
FILE	WMWF_0035_02A 110 DDPages Koala	PRODUCED	I.Mackey
		APPROVED	M.Rookwood
		REV	02A

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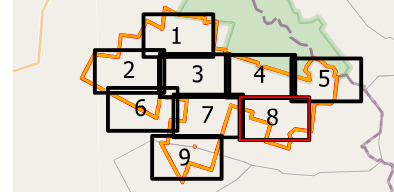
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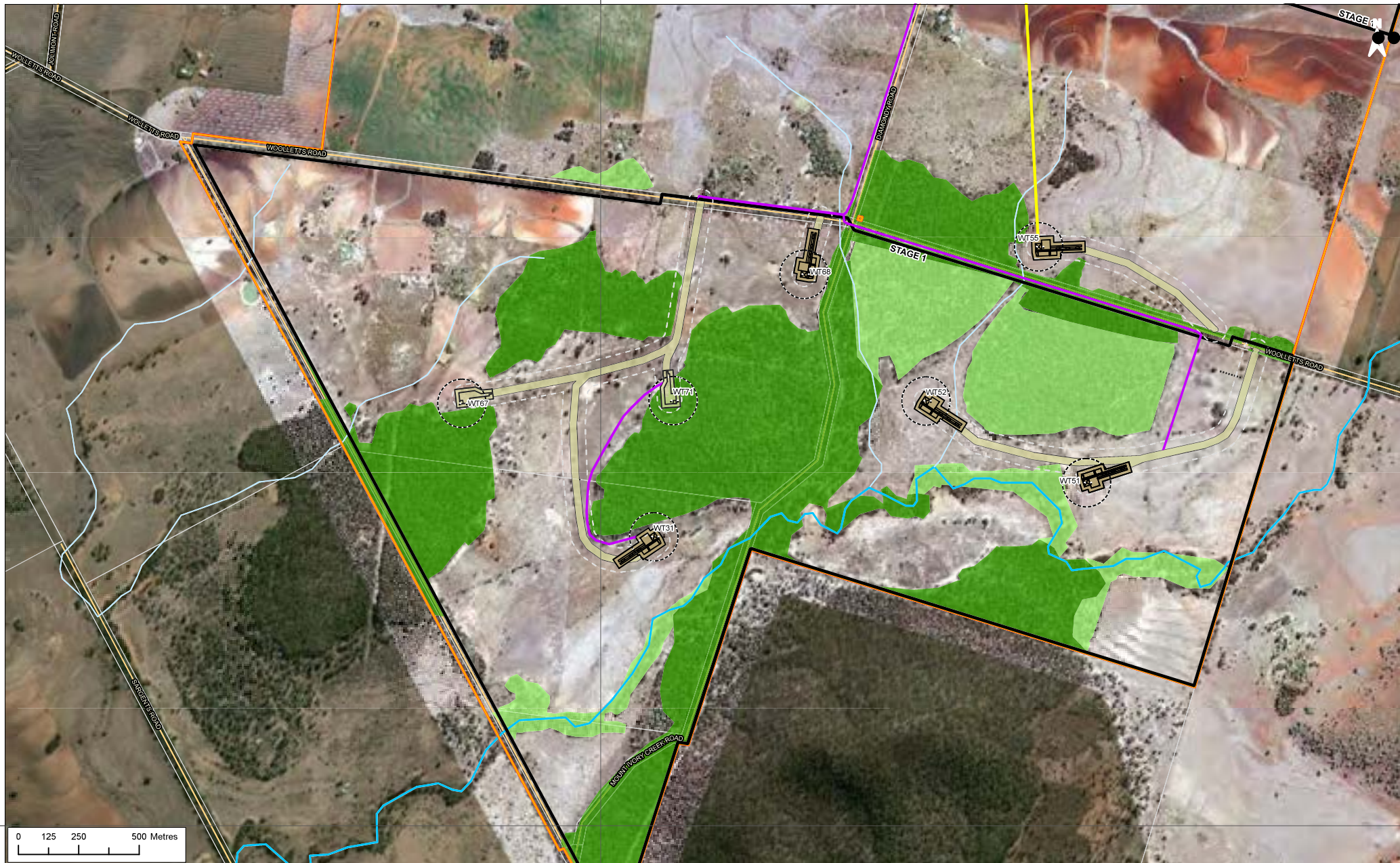


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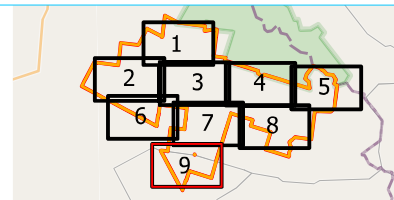
<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.8: Koala Habitat</b>			
PROJECT	DATE	STATUS	PRODUCED
	14/07/2021	IFU	I.Mackey
SCALE	1:15,000 @ A3	DATUM	APPROVED
		GDA 1994 MGA Zone 56	M.Rookwood
FILE	WMWF_0035_02A 110 DDPages Koals	REV	02A



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<b>Wambo Wind Farm</b>			
<b>Detailed Habitat Plans</b>			
<b>Figure C2.1-2.9: Koala Habitat</b>			
PROJECT	DATE	STATUS	PRODUCED
	14/07/2021	IFU	I.Mackey
SCALE	DATUM	APPROVED	
1:15,000 @ A3	GDA 1994 MGA Zone 56	M.Rookwood	
FILE	REV		
WMWF_0035_02A 110 DDPages Koals	02A		

## **APPENDIX B      TABLE OF COMMITMENTS**

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Addressing risks of Offset Area: Failure of regrowth vegetation improvement and eucalypt recruitment and/or completion criteria are unlikely to be met</p> <p><b>Section 4.2 – Table 4-4</b></p>	<p>Ecological outcome</p>	<p>Implementation of the management actions and adaptive management framework as outlined in this OAMP.</p> <p>Includes related triggers for corrective actions and corrective actions</p>
<p>Addressing risks of Offset Area: Introduction, establishment and spread of non-native weeds</p> <p><b>Section 4.2 – Table 4-4</b></p>	<p>Ecological outcome</p>	<p>Baseline weed data for the Offset Area will be conducted within the first 12 months of implementation.</p> <p>A primary management action for weed control will be low intensity grazing by cattle (stock management).</p> <p>Herbicide, mechanical and Biological control will be put into action to reduce the spread of mother of millions, parthenium and lantana.</p> <p>Fire will be used every 6-10 years to assist with weed management and non-eucalypt woody undergrowth. This schedule is in line with the RE fire management regime recommended for the maintenance of biodiversity for RE 11.10.1.</p> <p>These weed control actions should be undertaken in the first year throughout the Offset Area and then at the optimum time in the weeds life cycle control will periodically take place to minimise the spread of existing weeds.</p> <p>Includes related triggers for corrective actions and corrective actions</p>
<p>Addressing risks of Offset Area: Fire</p> <p><b>Section 4.2 – Table 4-4</b></p>	<p>Ecological outcome</p>	<p>Implement fire management in accordance with the following requirements:</p> <p>If there are one or more bushfires that are current in the region and they are considered current in the region and threatening to the site, then coordinate with all relevant fire authorities to determine an appropriate method to protect the site.</p> <p>The approval holder will maintain firebreaks along boundaries of the property. These breaks must be inspected periodically and have maintenance occur once every three years.</p> <p>Low intensity grazing by livestock, and cool controlled burns in winter months on a 6-10 year return interval, to maintain the required structure and condition of the Offset Area to improve habitat value.</p> <p>Controlled burns must follow the fire management guidelines specific for the RE within the Offset Area (11.10.1).</p> <p>Burns are to be undertaken late wet to early dry season when there is good soil moisture, or early storm season or after good spring rains</p> <p>Burns are to be a low intensity with intervals from 6-10 years</p> <p>Important note: if there is fire damage to the Offset Areas then it must be reported by the landholder. The approval holder is required to report any damage to the Offset Areas to the Commonwealth.</p> <p>Includes related triggers for corrective actions and corrective actions</p>

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Addressing risks of Offset Area: Impacts from Feral/Pest Animals <b>Section 4.2 – Table 4-4</b></p>	<p>Ecological outcome</p>	<p>Continue to engage in local control program for foxes and feral dogs as the Offset Area is adjacent to, and east of the dog control fence. Feral animal control will be coordinated with regional eradication programs (e.g. baiting and trapping events) in consultation with Western Downs Regional Council. Noting that fox and wild dog management currently occur by landholder and this OAMP commitment formalises that ongoing control will remain. Includes related triggers for corrective actions and corrective actions</p>
<p>Addressing risks of Offset Area: grazing pressures <b>Section 4.2 – Table 4-4</b></p>	<p>Ecological outcome</p>	<p>Reduce current stocking rates (1 in 5 ha) by 40-60%. Monitor stocking rates of the area throughout the duration of the Offset Area. Includes related triggers for corrective actions and corrective actions</p>
<p>Environmental objective and completion criteria for: Fire management <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>Fuel levels and burning regime maintained in accordance with ecological outcomes as set out in Table 4-4. No loss of habitat quality throughout the duration of the impact from wildfires. Fire management as per the fire management requirements for RE 11.10.1 (burning frequency 6-10 years). No unplanned fire in the Offset Area.</p>
<p>Environmental objective and completion criteria for: Grazing management <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>Evidence of low intensity grazing leading to reduce fuel loads and minimal damage to eucalypt regrowth vegetation No loss of habitat quality throughout the duration of the impact from stock permitted to graze within the Offset Area.</p>
<p>Environmental objective and completion criteria for: Native vegetation management <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>&gt;65% of benchmark RE criteria for regrowth areas in year 10 for number of large eucalypt trees and tree canopy cover 75% of benchmark RE criteria for regrowth areas in year 20 for number of large trees and tree canopy cover &gt;80% of benchmark RE criteria for Remnant areas in year 10 &gt;90% of benchmark RE criteria for Remnant areas in year 20 Maintain the extent of habitat within the Offset Area by prohibiting selective logging practices.</p>
<p>Environmental objective and completion criteria for: Integrated pest animal control <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>No more than 10 or more feral pigs or two feral dogs during any inspection.</p>

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Environmental objective and completion criteria for: Integrated weed management and control of high threat weeds <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>Baseline weed mapping is completed for the Offset Area and a weed management strategy developed and implemented within 12 months of the commencement of the action and a management strategy developed.</p> <p>All Weeds of National Significance (WONS) identified in the Offset Area to be treated within 12 months of the commencement of the action</p> <p>Weed cover must not exceed 5% cover in the Offset Area for the duration of the offset.</p> <p>No new prohibited or restricted matters listed under the Biosecurity Act are identified at BioCondition assessments or monitoring sites (based on subsequent monitoring events), or opportunistically, i.e. if noted outside of BioCondition assessments or monitoring surveys.</p>
<p>Environmental objective and completion criteria for: Monitoring <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>Ecological monitoring (BioCondition assessments and species surveys) will be undertaken every five years until the completion criteria have been met. The completion criteria required are a habitat quality score of 8 for koala and 7 for greater glider.</p> <p>The benchmark score is denoted above as &gt;80% for regrowth areas and &gt;90% for current remnant areas</p> <p>Reports will be submitted annually following photo monitoring events and after all other times that monitoring events occur (for example, species surveys), as required by the Annual Compliance Reporting under the EPBC Act approval.</p> <p>Management of the Offset Area must continue at least until all completion criteria have been met. If completion criteria are met, then monitoring frequency can be decreased, but not ceased. Monitoring must continue in order to detect if completion criteria are no longer being met, in which case, management actions and increased monitoring must resume.</p>
<p>Environmental objective and completion criteria for: Reduction in current grazing activity <b>Section 4.3 – Table 4-5</b></p>	<p>Environmental objective</p>	<p>Increase the richness and average % cover from the baseline measured, of native perennial grasses, as measured at each habitat quality assessment site based on the results of baseline and subsequent BioCondition assessments and monitoring events.</p>
<p>Interim targets of the completion criteria. <b>Section 4.3 – Table 4-6</b></p>	<p>Environmental objective</p>	<p>Refer Table 4-6 for the interim targets of the completion criteria commitments made in Table 4-5 and above.</p>
<p>Corrective actions <b>Section 4.2 – Table 4-4; and Section 4.4</b></p>	<p>Environmental objective</p>	<p>Specific corrective actions for each management action are outlined in Table 4-4 in Section 4.2</p>
<p>Monitoring actions <b>Section 5.1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Summary of commitments for monitoring actions</p> <p>5 yearly MHQA transect sampling, i.e. BioCondition assessments;</p> <p>5 yearly koala and greater glider targeted surveys;</p> <p>Annual photopoint monitoring; and</p> <p>Quarterly inspections for fire management, cattle grazing impacts and pest species management</p>

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Ecological monitoring: Threatened species habitat management <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives Environmental objectives and completion criteria)</p>	<p>Every five years a MHQA and BioCondition assessment, including koala and greater glider specific habitat attributes, will be conducted in accordance with the Biocondition Assessment Manual (Neldner et al., 2015).</p> <p>14 field-based ecological condition indicators used in the MHQA will be monitored to track the effectiveness and success of the management plan for the koala and greater glider offset:</p> <ol style="list-style-type: none"> <li>1. Recruitment of woody perennial species – includes koala and greater glider canopy feed and shelter tree species.</li> <li>2. Native plant species richness (trees, shrubs and grasses) – as an indicator of ecological succession and regeneration progress after mitigating ecosystem threats.</li> <li>3. Tree canopy height – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>4. Tree canopy cover – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>5. Shrub canopy cover – indicates progress towards ecological maturity and increases in koala and greater glider habitat availability.</li> <li>6. Native perennial grass cover – which suppresses weeds and thereby encourages recruitment of juvenile eucalypt feed and shelter trees.</li> <li>7. Organic litter cover – important for surface soil moisture retention, cycling of nutrients and providing interstitial spaces to enhance tree seed germination and growth and recruitment of canopy species including actively-growing koala feed and shelter species.</li> <li>8. Large trees per hectare – as a measure of important as shelter trees for Koalas and the production of seeds for recruitment.</li> <li>9. Coarse woody debris per hectare – an increase relative to the benchmark could indicate a decline in canopy tree health / increase in senescence.</li> <li>10. Invasive plant cover – which can compete with native plants for light, moisture and nutrients, especially recruiting koala and greater glider food and shelter tree canopy species. Invasive plants can increase fuel load and change fire regimes and susceptibility to unplanned fires.</li> <li>11. Quality and availability of food and foraging – e.g. number, size and health of feed trees.</li> <li>12. Quality and availability of shelter – e.g. density and health of shelter trees.</li> <li>13. Threats to species – e.g. feral dog/fox/pig activity and the documented number of culled dogs.</li> <li>14. Hollow trees size and number per hectare – as a measure important as shelter trees for greater glider.</li> </ol> <p>These attributes will be input into the MHQA to assess the progress of the Offset Area towards the completion criteria. The location of the monitoring transects are shown in Figure 5-1 and correspond with the same location where MHQA transects were positioned to measure the start habitat quality score of the offset area.</p>



Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Ecological monitoring: Targeted surveys for koala and greater glider <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Every five years targeted surveys for the koala and greater glider will be undertaken in accordance with the relevant survey guidelines (Survey guidelines for Australia’s threatened mammals (DSEWPC 2011), EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DoE 2014)). This will outline information relating to: Presence of koalas in Offset Area, including estimated numbers and location of sightings, scratch marks or scats, Presence of greater glider in Offset Area, including estimated numbers and location of sightings, as well as identification and mapping of all den trees with suitable hollow dimensions for greater glider.</p>
<p>Quarterly monitoring: Fire management <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Monitoring requirements will include quarterly monitoring and annual reporting of access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of reduced intensity of livestock.</p>
<p>Quarterly monitoring: Grazing management <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Where areas within the Offset Area are allowed to be grazed, this should be monitored monthly during grazing times to ensure there is no grazing pressure or disturbance affecting areas offset for koala and greater glider habitat. Stocking rates are also to be recorded in the months where the Offset Area is to be used for grazing. Inspections of the property boundary fence will be conducted quarterly by the landowner. Any damage to the fence that may allow vehicles or stock to enter outside of the parameters outlined in this OAMP will be repaired as soon as practical.</p>
<p>Quarterly monitoring: Native vegetation management <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Permanent survey transects will be established at the baseline survey points as per the ecology report (ERM, 2021a) this is denoted in Figure 5-1. Photo point monitoring is to be undertaken annually at the same time of the year. The photos provide the baseline imagery to compare future photo point monitoring and to ensure the Integrity of the fence. A record of the photos will be maintained which includes: GPS co-ordinates of the photo point. Date, time and number of each photo. Direction in which the photo was taken (north, south, east and west). After each monitoring event, a GPS waypoint of the location of the habitat and a polyline extent will be recorded. The following elements will be noted on a field datasheet: The presence of weeds within the rehabilitation extent. MHQA survey transects Natural regeneration of native species. Establishment of planting stock</p>
<p>Quarterly monitoring: Integrated pest animal control <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>Animal management and monitoring will be undertaken in accordance with the Biosecurity Act 2014 (Qld). This requires that reasonable and practical steps be taken to prevent or minimise biosecurity risks; minimise the likelihood of causing a ‘biosecurity event’; and the limitation of consequences if such an event is caused. The control of pest animals will be undertaken using legal methods, and consistent with existing control campaigns (adjacent to wild dog fence). Quarterly monitoring and annual reporting will be undertaken in accordance with the existing control programs.</p>

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Quarterly monitoring: Integrated weed management and control of WONS <b>Section 5 – Table 5-1</b></p>	<p>To assist in the tracking of environmental objectives (Environmental objectives and completion criteria)</p>	<p>The presence of WONS and other invasive weeds will be monitored quarterly and reported annually, commencing within the first 12 months of the OAMP being approved. The monitoring will be undertaken during the same time of year, each year, to ensure that the timing is consistent and aligns with the baseline assessment. The following procedures will be implemented to ensure that the annual monitoring event aligns with the baseline monitoring methodology:</p> <p>GPS locate the presence of weeds either via a GPS waypoint, or where large infestation is present, create a GPS polyline and walk the extent of the infestation.</p> <p>On a field datasheet, detailing the time of year of the monitoring event, list of observed WONS, photo location and direction and notes of any notable positive and/or negative changes in weed density and coverage.</p> <p>Weed monitoring should also be informed by the previous year's weed survey mapping, field datasheet and photos for noting changes in weed infestations and densities.</p> <p>Transfer GPS data to the necessary programs to generate weed survey mapping extent and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring purposes.</p>
<p>Reporting frequency and OAMP review <b>Section 5.2</b></p>	<p>Environmental objective and ecological outcome (by way or reporting annual compliance and adaptive management)</p>	<p>An annual compliance report will be prepared and submitted to DAWE by the approval holder, reporting on compliance with all approval conditions under the EPBC Act. The report will document any incident reports of undesirable impacts on koalas and greater gliders, and any monitoring and management milestones, including tracking of progress towards the required performance and completion criteria (Table 4-6), achieved that occurred during the previous 12 months, including progress on key management and implementation of management actions. The annual report will provide an update on activities and monitoring of fire, grazing, native vegetation, weeds and pests.</p> <p>Suitably qualified ecologists/appropriate experts will be engaged to conduct ecological monitoring (including targeted surveys and MQHA BioCondition assessments). Reports will be submitted to the approval holder every 5 years, and the approval holder will include a summary of findings as part of the required Annual Compliance Report (year 5, 10, 15, 20).</p> <p>This plan has been prepared and implemented until the impacts for the duration of the impact have been averted. Management actions will be reported on in the annual reporting, and adapted where required, if triggers are reached and corrective actions are required to be implemented. If management actions need substantial adjustment, this OAMP may be reviewed in consultation with the landholder, a senior ecologist and/or a senior land management (with over 5 years relevant expertise and knowledge) and submit as per the conditions that relate to variations of the OAMP.</p>

Aspect/Section of OAMP	Environmental objective/Ecological outcome	Commitment
<p>Legally securing the offset area <b>Section 7</b></p>	<p>Ecological outcomes</p>	<p>Legal securement of the Offset Area for this Project will be obtained via a voluntary declaration per Section 19F of the VM Act. The Offset Area will be secured upon the approval submission of this OAMP and within 9 months of commencement of the action. A Voluntary Declaration will be registered on the property title and the Offset Area will be mapped as a Category A area on the Property Map of Assessable Vegetation (PMAV). A Category A area on a PMAV is described as an "Area subject to compliance notices, offsets and voluntary declarations". The Voluntary Declaration will provide enduring protection against development incompatible with conservation.</p>
<p>Duty of care requirements <b>Section 7.1</b></p>	<p>Ecological outcomes</p>	<p>The approval holder is accountable for the financial investment in of the offset and the implementation of the OAMP. Completion of the actions will be recorded through the Annual Compliance Reporting requirements as a condition of the EPBC Act approval permit. This annual reporting will reference the completion benchmark criteria (Table 4-6) to ensure that the Offset Area is producing the required progress towards the interim targets and outlined completion criteria. The approval holder will coordinate reporting, reviewing, inspections, auditing and any adaptive management changes to the OAMP, including any revision and submission for approval of the OAMP. A nominated person will be assigned the responsibilities of managing offset requirements for the approval holder.</p> <p>The approval holder will enter into an arrangement with the landowner to undertake the management actions and day to day management of the site, including fencing, managing firebreaks, weed and feral animal management and grazing management.</p> <p>The approval holder will engage suitably qualified persons to undertake the MHQA assessments (BioCondition assessments), ecological studies, koala and greater glider surveys, prepare reports and undertake inspections, as required.</p> <p>Incidents identified on site will be reported to the approval holder. The level of severity will dictate the necessary actions and responses through the approval holder's formal incident management system.</p> <p>General incidents, for example, feral dog incursion, will be managed by the landowner. Responses to incidents adversely impacting habitat quality within the Offset Area, or koalas and greater gliders directly, will be coordinated by the approval holder, to ensure remediation or enhanced management measures are implemented to address the incident as soon as reasonably possible</p>

## **APPENDIX C      OFFSET CALCULATORS**

OFFSET - Fauna Species

Assessment Unit - Regional Ecosystem Site Reference	AU 1 RE 11.10.1 remnant (Impact site 1)				AU 1 RE 11.10.1 remnant (Impact site 2)				Average Score	Site score
	Benchmark 11.10.1	Site 3			Benchmark 11.10.1	Site 6				
		Raw Data	% Benchmark	Score		Raw Data	% Benchmark	Score		
<b>Site Condition</b>										
Recruitment of woody perennial species in EDL	100	100	100	5	100	100	100	5		
Native plant species richness - trees	4	4	100	5	4	3	75	2.5		
Native plant species richness - shrubs	4	4	100	5	4	3	75	2.5		
Native plant species richness - grasses	9	7	78	2.5	9	5	56	2.5		
Native plant species richness - forbes	17	10	59	2.5	17	6	35	2.5		
Tree canopy height (average of emergent, canopy, sub-canopy)	19	18	95	5	19	17	89	5		
Tree canopy cover (average of emergent, canopy, sub-canopy)	22	19	86	5	22	18	82	5		
Shrub canopy cover	13	12	92	5	13	6	46	3		
Native grass cover	16	14	88	5	16	10	63	3		
Organic litter	50	40	80	5	50	45	90	5		
Large trees (euc plus non-euc)	14	10	71	10	14	7	50	5		
Coarse woody debris	388	200	52	5	388	220	57	5		
Non-native plant cover	0	3	0	10	0	0	0	10		
Quality and availability of food and foraging habitat	25	20	80	8	25	20	80	8		
Quality and availability of shelter	25	20	80	8	25	15	60	6		
Scores for sampling sites				0.86				0.7		
Scores for assessment units								0.78		
Area-weighted scores for each assessment unit								0.78		
MAX Site Condition Score				100				100		
<b>Site Condition Score - out of 3</b>										<b>0.78</b>
<b>Site Context</b>										
Size of patch				5				5		
Connectedness				2				2		
Context				4				4		
Ecological Corridors				6				6		
Role of site location to species overall population in the state				1				1		
Threats to the species				7				7		
Species mobility capacity				7				7		
Scores for sampling sites				0.57				0.57		
Scores for assessment units								0.57		
Area-weighted scores for each assessment unit								0.57		
MAX Site Context Score				56				56		
<b>Site Context Score - out of 3</b>										<b>0.57</b>
<b>Overall Site Score</b>										<b>1.71</b>

Species Stocking Rate (SSR)			
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5
	No	Yes - adjacent	Yes - on site
Species usage of the site (habitat type & evidenced usage)	Score	0	5
	Not habitat	Dispersal	Foraging
			Breeding
Approximate density (per ha)	Score	0	10
	0%		20
Role/importance of species population on site*	Score (Total from supplementary table below)	0	5
		0 5 - 15	20 - 35
			40 - 45
Total SRR score (out of 70)	30		
<b>SRR Score (out of 4)</b>	<b>1.71</b>		

*SSR Supplementary Table			
*Key source population for breeding	Score	0	10
	No	Yes/ Possibly	
*Key source population for dispersal	Score	0	5
	No	Yes/ Possibly	
*Necessary for maintaining genetic diversity	Score	0	15
	No	Yes/ Possibly	
*Near the limit of the species range	Score	0	15
	No	Yes	

Final habitat quality score (weighted)	Greater Glider impact site
Site Condition score (out of 3)	2.3
Site Context Score (out of 3)	1.7
Species Stocking Rate Score (out of 4)	1.7
Habitat Quality score (out of 10)	5.8
Assessment Unit area (ha)	30
Total offset area (ha) for this MNES	30
Size Weighting	1.00
<b>Weighted Habitat Quality Score</b>	<b>5.8</b>

OFFSET - Fauna Species

Assessment Unit - Regional Ecosystem	AU 1 - RE 11.10.1 remnant (128ha)											AU 2 - RE 11.10.1 regrowth (9.9ha)							Offset Area Score		
	Site Reference	Benchmark	Site 1			Site 2			Site 6			Average Score	Benchmark	Site 5			Site 3			Average Score	
			11.10.1	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark			Score	11.10.1	Raw Data	% Benchmark	Score			Raw Data
<b>Site Condition</b>																					
Recruitment of woody perennial species in EDL	100	100	100	5	100	100	5	100	100	5		100	60	60	3	60	60	3			
Native plant species richness - trees	4	4	100	5	4	100	5	4	100	5		4	3	75	2.5	3	75	2.5			
Native plant species richness - shrubs	4	4	100	5	3	75	2.5	2	50	2.5		4	2	50	2.5	1	25	0			
Native plant species richness - grasses	9	5	56	2.5	5	56	2.5	4	44	2.5		9	4	44	2.5	3	33	2.5			
Native plant species richness - forbes	17	8	47	2.5	7	41	2.5	6	35	2.5		17	6	35	2.5	4	24	0			
Tree canopy height (average of emergent, canopy, sub-canopy)	19	18	95	5	17	89	5	16	84	5		19	16	84	5	15	79	5			
Tree canopy cover (average of emergent, canopy, sub-canopy)	22	18	82	5	14	64	5	17	77	5		22	15	68	5	12	55	5			
Shrub canopy cover	13	10	77	5	9	69	5	9	69	5		13	7	54	5	8	62	5			
Native grass cover	16	30	188	5	25	156	5	12	75	3		16	9	56	3	4	25	1			
Organic litter	50	35	70	5	35	70	5	30	60	5		50	30	60	5	20	40	3			
Large trees (euc plus non-euc)	14	8	57	10	6	43	5	9	64	10		14	6	43	5	5	36	5			
Coarse woody debris	388	200	52	5	180	46	2	300	77	5		388	100	26	2	180	46	2			
Non-native plant cover	0	3	0	10	3	0	10	0	0	10		0	0	0	10	20	20	5			
Quality and availability of food and foraging habitat	25	20	80	8	18	72	7	20	80	8		25	15	60	6	20	80	8			
Quality and availability of shelter	25	18	72	7	15	60	6	15	60	6		25	10	40	4	15	60	6			
Scores for sampling sites				0.85			0.73			0.80				0.63				0.53			
Scores for assessment units											0.79										0.58
Area-weighted scores for each assessment unit											0.73										0.04
MAX Site Condition Score				100			100			100.00				100							100
<b>Site Condition Score - out of 3</b>																					0.77
<b>Site Context</b>																					
Size of patch				10			10			10					10			10			
Connectedness				2			2			2					2			2			
Context				5			5			5					5			5			
Ecological Corridors				6			6			6					6			6			
Role of site location to species overall population in the state				1			1			1					1			1			
Threats to the species				7			7			7					7			7			
Species mobility capacity				7			7			7					7			7			
Scores for sampling sites				0.68			0.68			0.68				0.68				0.68			
Scores for assessment units											0.68										0.68
Area-weighted scores for each assessment unit											0.63										0.05
MAX Site Context Score				56			56			56				56				56			56
<b>Site Context Score - out of 3</b>																					0.68
<b>Site Context Score - out of 3</b>																					2.04

Species Stocking Rate (SSR)			
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	10
	No	Yes - adjacent	Yes - on site
Species usage of the site (habitat type & evidenced usage)	Score	0	15
	Not habitat	Dispersal	Foraging
Approximate density (per ha)	Score	0	30
	0%	10	20
Role/importance of species population on site*	Score (Total from supplementary table below)	0	15
	0 - 15	20 - 35	40 - 45
Total SRR score (out of 70)		30	
SRR Score (out of 4)		1.71	

*SSR Supplementary Table		
*Key source population for breeding	Score	0
	No	Yes/ Possibly
*Key source population for dispersal	Score	0
	No	Yes/ Possibly
*Necessary for maintaining genetic diversity	Score	0
	No	Yes/ Possibly
*Near the limit of the species range	Score	0
	No	Yes

	Greater Glider Woodland Offset site
Final habitat quality score (weighted)	2.3
Site Condition score (out of 3)	2.0
Site Context Score (out of 3)	1.7
Species Stocking Rate Score (out of 4)	6.1
Habitat Quality score (out of 10)	134.5
Assessment Unit area (ha)	134.5
Total offset area (ha) for this MNES	1.0
Size Weighting	6.1
<b>Weighted Habitat Quality Score</b>	

OFFSET - Fauna Species

Assessment Unit - Regional Ecosystem Site Reference	AU 1 RE 11.10.1 remnant (Impact site 1)				AU 1 RE 11.10.1 remnant (Impact site 2)				Average Score	Site score
	Benchmark 11.10.1	Site 3			Benchmark 11.10.1	Site 6				
		Raw Data	% Benchmark	Score		Raw Data	% Benchmark	Score		
<b>Site Condition</b>										
Recruitment of woody perennial species in EDL	100	100	100	5	100	100	100	5		
Native plant species richness - trees	4	4	100	5	4	3	75	2.5		
Native plant species richness - shrubs	4	4	100	5	4	3	75	2.5		
Native plant species richness - grasses	9	7	78	2.5	9	5	56	2.5		
Native plant species richness - forbes	17	10	59	2.5	17	6	35	2.5		
Tree canopy height (average of emergent, canopy, sub-canopy)	19	18	95	5	19	17	89	5		
Tree canopy cover (average of emergent, canopy, sub-canopy)	22	19	86	5	22	18	82	5		
Shrub canopy cover	13	12	92	5	13	6	46	3		
Native grass cover	16	14	88	5	16	10	63	3		
Organic litter	50	40	80	5	50	45	90	5		
Large trees (euc plus non-euc)	14	10	71	10	14	7	50	5		
Coarse woody debris	388	200	52	5	388	220	57	5		
Non-native plant cover	0	3	0	10	0	0	0	10		
Quality and availability of food and foraging habitat	25	20	80	8	25	20	80	8		
Quality and availability of shelter	25	20	80	8	25	15	60	6		
Scores for sampling sites				0.86				0.7		
Scores for assessment units								0.78		
Area-weighted scores for each assessment unit								0.78		
MAX Site Condition Score				100				100		0.78
<b>Site Condition Score - out of 3</b>										<b>2.34</b>
<b>Site Context</b>										
Size of patch				5				5		
Connectedness				5				5		
Context				4				4		
Ecological Corridors				4				4		
Role of site location to species overall population in the state				4				4		
Threats to the species				7				7		
Species mobility capacity				10				10		
Scores for sampling sites				0.70				0.70		
Scores for assessment units								0.70		
Area-weighted scores for each assessment unit								0.70		
MAX Site Context Score				56				56		0.70
<b>Site Context Score - out of 3</b>										<b>2.09</b>

Species Stocking Rate (SSR)			
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5
	No	Yes - adjacent	Yes - on site
Species usage of the site (habitat type & evidenced usage)	Score	0	15
	Not habitat	Dispersal	Foraging
Approximate density (per ha)	Score	0	30
	0%		
Role/importance of species population on site*	Score (Total from supplementary table below)	0	15
	0	5 - 15	20 - 35
Total SSR score (out of 70)		40	
<b>SRR Score (out of 4)</b>		<b>2.29</b>	

*SSR Supplementary Table		
*Key source population for breeding	Score	0
	No	Yes/ Possibly
*Key source population for dispersal	Score	0
	No	Yes/ Possibly
*Necessary for maintaining genetic diversity	Score	0
	No	Yes/ Possibly
*Near the limit of the species range	Score	0
	No	Yes

Final habitat quality score (weighted)	Koala impact site
Site Condition score (out of 3)	2.34
Site Context Score (out of 3)	2.09
Species Stocking Rate Score (out of 4)	2.3
Habitat Quality score (out of 10)	6.7
Assessment Unit area (ha)	30
Total offset area (ha) for this MNES	30
Size Weighting	1.00
<b>Weighted Habitat Quality Score</b>	<b>7</b>

OFFSET - Fauna Species

Assessment Unit - Regional Ecosystem	AU 1 - RE 11.10.1 remnant (128ha)											AU 2 - RE 11.10.1 regrowth (9.9ha)											Offset Area Score
Site Reference	Benchmark	Site 1			Site 2			Site 6			Average Score	Benchmark	Site 5			Site 3			Average Score				
11.10.1	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score					
<b>Site Condition</b>																							
Recruitment of woody perennial species in EDL	100	100	100	5	100	100	5	100	100	5	100	100	5	100	60	60	3	60	60	3			
Native plant species richness - trees	4	4	100	5	4	100	5	4	100	5	4	100	5	4	3	75	2.5	3	75	2.5			
Native plant species richness - shrubs	4	4	100	5	3	75	2.5	2	50	2.5	4	2	50	2.5	1	25	0	1	25	0			
Native plant species richness - grasses	9	5	56	2.5	5	56	2.5	4	44	2.5	9	4	44	2.5	3	33	2.5	3	33	2.5			
Native plant species richness - forbes	17	8	47	2.5	7	41	2.5	6	35	2.5	17	6	35	2.5	4	24	0	4	24	0			
Tree canopy height (average of emergent, canopy, sub-canopy)	19	18	95	5	17	89	5	16	84	5	19	16	84	5	15	79	5	15	79	5			
Tree canopy cover (average of emergent, canopy, sub-canopy)	22	18	82	5	14	64	5	17	77	5	22	15	68	5	12	55	5	12	55	5			
Shrub canopy cover	13	10	77	5	9	69	5	9	69	5	13	7	54	5	8	62	5	8	62	5			
Native grass cover	16	30	188	5	25	156	5	12	75	3	16	9	56	3	4	25	1	4	25	1			
Organic litter	50	35	70	5	35	70	5	30	60	5	50	30	60	5	20	40	3	20	40	3			
Large trees (euc plus non-euc)	14	8	57	10	6	43	5	9	64	10	14	6	43	5	5	36	5	5	36	5			
Coarse woody debris	388	200	52	5	180	46	2	300	77	5	388	100	26	2	180	46	2	180	46	2			
Non-native plant cover	0	3	0	10	3	0	10	0	0	10	0	0	10	0	10	0	10	0	10	0			
Quality and availability of food and foraging habitat	25	20	80	8	18	72	7	20	80	8	25	15	60	6	20	80	8	20	80	8			
Quality and availability of shelter	25	18	72	7	15	60	6	15	60	6	25	10	40	4	15	60	6	15	60	6			
Scores for sampling sites				0.85			0.73			0.80			0.63			0.53				0.58			
Scores for assessment units											0.79									0.04			
Areawighted scores for each assessment unit											0.73												
MAX Site Condition Score				100			100				100.00				100					100			
<b>Site Condition Score- out of 3</b>																				0.77			
<b>Site Context</b>																							
Size of patch				10			10			10			10			10				10			
Connectedness				4			4			4			4			4				4			
Context				5			5			5			5			5				5			
Ecological Corridors				6			6			6			6			6				6			
Role of site location to species overall population in the state				5			5			5			5			5				5			
Threats to the species				7			7			7			7			7				7			
Species mobility capacity				10			10			10			10			10				10			
Scores for sampling sites				0.84			0.84			0.84			0.84			0.84				0.84			
Scores for assessment units											0.84									0.06			
Areawighted scores for each assessment unit											0.78												
MAX Site Context Score				56			56			56			56			56				56			
<b>Site Context Score- out of 3</b>																				0.84			
																					2.32		
																					2.52		

Species Stocking Rate (SSR)	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score: 0 (No) / 5 (Yes - adjacent) / 10 (Yes - on site)
Species usage of the site (habitat type & evidenced usage)	Score: 0 (Not habitat) / 5 (Dispersal) / 10 (Foraging) / 15 (Breeding)
Approximate density (per ha)	Score: 0 (0%) / 10 (20%) / 30 (40%)
Role/importance of species population on site*	Score (Total from supplementary table below): 0 (5 - 15) / 5 (20 - 35) / 10 (40 - 45) / 15
Total SRR score (out of 70)	35
<b>SRR Score (out of 4)</b>	<b>2.00</b>

*SSR Supplementary Table	
*Key source population for breeding	Score: 0 (No) / 5 (Yes/ Possibly) / 10
*Key source population for dispersal	Score: 0 (No) / 5 (Yes/ Possibly) / 10
*Necessary for maintaining genetic diversity	Score: 0 (No) / 5 (Yes/ Possibly) / 10
*Near the limit of the species range	Score: 0 (No) / 5 (Yes) / 10

	Koala euc forest offset site
Final habitat quality score (weighted)	2.3
Site Condition score (out of 3)	2.5
Site Context Score (out of 3)	2.0
Species Stocking Rate Score (out of 4)	6.8
Habitat Quality score (out of 10)	137.9
Assessment Unit area (ha)	137.9
Total offset area (ha) for this MNES	1.0
Size Weighting	<b>6.8</b>
<b>Weighted Habitat Quality Score</b>	



# Offsets Assessment Guide

Use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999  
October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Greater Glider
EPBC Act status	Valuable
Annual probability of extinction based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source		
<i>Ecological communities</i>							
Area of community	Yes		Area	Hectares			
			Quality	Scale 0-10			
			Total quantum of impact	0.00			Adjusted hectares
<i>Threatened species habitat</i>							
Area of habitat	Yes		Area	30 Hectares			
			Quality	6			Scale 0-10
			Total quantum of impact	18.00			Adjusted hectares
<i>Threatened species</i>							
<i>Threatened species</i>							
Birth rate e.g. Change in nest success	No						
Mortality rate e.g. Change in number of road kills per year	No						
Number of individuals e.g. Individual plants/animals	No						

Offset calculator																				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source				
<i>Ecological Communities</i>																				
Area of community	Yes	Adjusted hectares			Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset	0.00	0.00	0.00	0.00	0.00	#DIV/0!	#DIV/0!					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0												
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	0.00	0.00	0.00									
<i>Threatened species habitat</i>																				
Area of habitat	Yes	Adjusted hectares	134.5		Time over which loss is averted (max. 20 years)	20	Start area (hectares)	137.9	Risk of loss (%) without offset	5%	Risk of loss (%) with offset	0%	6.90	60%	4.14	3.97	19.15	106.37%	Yes	
					Future area without offset (adjusted hectares)	131.0	Future area with offset (adjusted hectares)	137.9												
					Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	2.00	65%	1.30	1.25				
<i>Threatened species</i>																				
<i>Threatened species</i>																				
Number of features e.g. Nest hollows, habitat trees	Yes	Count							0		0.00	0.00	#DIV/0!	#DIV/0!						
Condition of habitat Change in habitat condition, but no change in extent	No																			
<i>Threatened species</i>																				
<i>Threatened species</i>																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0	0.00	#DIV/0!	#DIV/0!	\$0.00	#DIV/0!	#DIV/0!
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	18	19.15	106.37%	Yes	\$0.00	N/A	\$0.00
Area of community	0	0.00	#DIV/0!	#DIV/0!	\$0.00	#DIV/0!	#DIV/0!
					\$0.00	#DIV/0!	#DIV/0!

# Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999  
October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Valuable
Annual probability of extinction based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source	
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes		Area	30	Hectares	
			Quality	7	Scale 0-10	
			Total quantum of impact	21.00	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
<i>Ecological Communities</i>																				
Area of community	No					Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset		Risk of loss (%) with offset										
								Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0									
								Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)						
<i>Threatened species habitat</i>																				
Area of habitat	Yes	21.00	Adjusted hectares	161	20	Time over which loss is averted (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	5%	Risk of loss (%) with offset	0%									
								Future area without offset (adjusted hectares)	137.9	Future area with offset (adjusted hectares)	137.9	6.90	60%	4.14	3.97					
								Time until ecological benefit	20	Start quality (scale of 0-10)	7	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	2.00	75%	1.50	1.44	
<i>Threatened species</i>																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g. Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	21	22.06	105.05%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					<b>\$0.00</b>	<b>\$0.00</b>	<b>\$0.00</b>

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