



Boulder Creek
Wind Farm



Boulder Creek Wind Farm Stage 1 Offset Area Management Plan




Prepared for Boulder Creek Wind Farm Pty Ltd

18 March 2026

Document Information

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Contents

1. Introduction.....	1
1.1 Background.....	1
1.2 Purpose and scope.....	2
1.3 Relevant approval conditions.....	2
1.4 Summary of residual impacts.....	4
2. Offset area description.....	7
2.1 Overview.....	7
2.2 Tenure and ownership.....	7
2.3 Summary of historical survey effort.....	7
2.4 Land use.....	8
2.5 Connectivity.....	8
2.6 Climate.....	10
2.7 Regional ecosystems.....	11
2.8 Koala offset area.....	15
2.9 <i>Cycas megacarpa</i> offset area.....	16
3. Baseline survey results.....	20
3.1 Re-mapping assessment units.....	20
3.2 Establishing monitoring sites.....	20
3.3 Weed presence and abundance.....	24
3.4 Pest animal activity.....	29
3.5 <i>Cycas megacarpa</i>	30
3.6 Fire risk assessment.....	31
3.7 Koala habitat quality.....	32
3.8 <i>Cycas megacarpa</i> habitat quality.....	36
4. Threats to MNES.....	40
4.1 Weeds.....	40
4.2 Pest animals.....	40
4.3 Vegetation clearing.....	41
4.4 Vehicle strike.....	41
4.5 Inappropriate or altered fire regimes.....	41
5. Offset area outcomes.....	42
5.1 Interim milestones and completion criteria.....	42
5.2 Performance targets.....	42

6.	Adaptive Management.....	45
6.1	Process.....	45
6.2	Risk assessment.....	45
6.3	Timing for implementation.....	45
7.	Management Program.....	46
7.1	Legal security.....	46
7.2	General restrictions.....	46
7.3	Fencing and access.....	47
7.4	Weed management.....	47
7.5	Pest animal management.....	56
7.6	Grazing management.....	59
7.7	Fire management.....	62
8.	Monitoring Program.....	66
8.1	Annual inspections.....	66
8.2	Fire management monitoring.....	66
8.3	Weed surveys.....	68
8.4	Pest animal surveys.....	70
8.5	Habitat quality assessments.....	73
8.6	<i>Cycas megacarpa</i> targeted surveys.....	74
8.7	Koala targeted surveys.....	76
9.	Corrective actions.....	77
10.	Reporting and data management.....	81
10.1	Annual report.....	81
10.2	Five yearly reports.....	81
10.3	Data management.....	82
10.4	Experience and qualifications of third parties.....	83
11.	Implementation schedule.....	84
12.	References.....	85
Appendix A	BCOA MHQA Methods.....	1
Appendix B	Risk Assessment.....	1
Appendix C	EPBC Act Offset Principles.....	1
Appendix D	Suitably Qualified Ecologists.....	1
Appendix E	EPBC Act Offset Calculators.....	1

Appendix F	Offset Calculator Justifications	1
Appendix G	Consistency with Conservation Advice	1

Tables

Table 1.1	Relevant EPBC Act approval conditions.....	2
Table 1.2	Stage 1 Project impacts	4
Table 2.1	Land tenure.....	7
Table 2.2	Mean rainfall and mean maximum and minimum temperatures.....	10
Table 2.3	Regional ecosystems mapped within the Stage 1 BCOA	11
Table 2.4	Koala LIKT and ancillary habitat trees within the Stage 1 BCOA	16
Table 3.1	Stage 1 BCOA assessment units and survey sites.....	21
Table 3.2	Weed species most frequently recorded	24
Table 3.3	Weed species within highest average cover (%)	25
Table 3.4	Baseline weed survey results.....	27
Table 3.5	Baseline wild dog survey results.....	29
Table 3.6	Baseline feral cat survey results	29
Table 3.7	Baseline European hare survey results.....	29
Table 3.8	Baseline <i>Cycas megacarpa</i> survey results	30
Table 3.9	Koala offset area site condition scores.....	32
Table 3.10	Koala offset area site context scores.....	33
Table 3.11	Koala offset area species stocking rate scores	34
Table 3.12	Summary of Year 1 habitat quality scores for koala offset area	35
Table 3.13	Stage 1 koala offsets assessment guide inputs	35
Table 3.14	<i>Cycas megacarpa</i> offset area site condition scores	36
Table 3.15	<i>Cycas megacarpa</i> offset area site context scores	36
Table 3.16	<i>Cycas megacarpa</i> offset area species stocking rate scores.....	37
Table 3.17	Summary of Year 1 habitat quality scores of <i>Cycas megacarpa</i> offset area	38
Table 3.18	Stage 1 <i>Cycas megacarpa</i> offsets assessment guide inputs.....	39
Table 5.1	Interim milestones and completion criteria	42
Table 5.2	Performance targets	43
Table 7.1	Summary of management program activities.....	46
Table 7.2	Offset area restrictions	46
Table 7.3	Priority weed species for management.....	48
Table 7.4	Priority assessment units for weed management in years 1, 2 and 3.....	49
Table 7.5	Weed management control techniques for priority species.....	51
Table 7.6	Grazing strategy for biomass control	59
Table 8.1	Summary of monitoring program activities.....	66
Table 8.2	Annual inspection requirements	66
Table 8.3	Weed monitoring survey sites.....	68
Table 8.4	Pest animal camera trap sites per assessment unit	71
Table 8.5	Habitat quality survey sites	73
Table 8.6	<i>Cycas megacarpa</i> survey sites	75
Table 9.1	Risks to offset outcomes and proposed corrective actions.....	77
Table 10.1	Data required for OAMP monitoring.....	82
Table 11.1	Implementation schedule - management, monitoring and reporting	84

Figures

Figure 1-1	Stage 1 BCOA location	6
Figure 2-1	Stage 1 BCOA connectivity.....	9
Figure 2-2	Mean rainfall and mean maximum and minimum temperatures	10
Figure 2-3	Stage 1 BCOA regional ecosystems	14
Figure 2-4	Koala offset area.....	18
Figure 2-5	<i>Cycas megacarpa</i> offset area	19
Figure 3-1	Stage 1 BCOA assessment units and survey sites.....	23
Figure 3-2	Stage 1 BCOA baseline weed cover data	28
Figure 6-1	An example of the adaptive management cycle (Jones, 2005).....	45
Figure 7-1	Weed management approach.....	47
Figure 7-2	Growth calendar for <i>Lantana Camara</i>	50
Figure 7-3	Grazing management areas and fencing	61
Figure 7-4	Indicative fire breaks and fire management lines	65
Figure 8-1	Distribution of ground cover to assist in determining percentage biomass and weed cover	67
Figure 8-2	Pest animal survey sites.....	72

Terms and Abbreviations

Terms/acronyms	Definition
ACDC licence	Agricultural Chemical Distribution Control licence
Attexo	Attexo Group Pty Ltd
AU	Assessment Unit
BCOA MHQA method	Boulder Creek Offset Area Modified Habitat Quality Assessment Method
BCWF	Boulder Creek Wind Farm Pty Ltd
BKSS	Balanced Koala Scat Survey protocol
BOM	Bureau of Meteorology
CMTMP	<i>Cycas megacarpa</i> Translocation Management Plan
DAMP	Declared Area Management Plan
DCCEEW	Department of Climate Change, Energy, Environment and Water (Commonwealth)
EMM	EMM Consulting Pty Ltd
EOS	Environmental Offset Strategy
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
GTRE	Ground-truthed Regional Ecosystems
GPS	Global Positioning System
ha	Hectares
Habitat critical to the survival of the species	As defined by the Matters of National Environmental Significance - Significant Impact Guidelines 1.1 (DEWHA, 2013)
HQ	Habitat Quality
IWM	Integrated Weed Management
km	Kilometres
LEC	Land and environment consultants Pty Ltd
LGA	Local Government Area
LIKT	Locally Important Koala Tree
KMBs	Koala Management Bioregions
KRAM	Koala Rapid Assessment Method
Matter Area	The total Offset Area that applies to a specific Matter
MNES	Matter of National Environmental Significance
MSDS	Material Safety Data Sheet
NC Act	<i>Nature Conservation Act 1992</i> (Queensland)
NR	Non-Remnant condition under the Queensland regional ecosystem framework
OAG	Offsets Assessment Guide
Offset agreements	The legal agreements to be entered into between BCWF and relevant landholders to secure and manage the offset and make the OAMP contractually binding on the landholders.
RE	Regional Ecosystem
REG	Regrowth
REM	Remnant

Terms/acronyms	Definition
SAT	Spot Assessment Technique
SEQERF	South East Queensland Ecological Restoration Framework: Manual
SQE	Suitably Qualified Ecologist
SSR	Species Stocking Rate
Stage 1 BCOA	Boulder Creek Wind Farm Offset Area
Stage 1 OAMP	Stage 1 Offset Area Management Plan
TEC	Threatened Ecological Community
The Project	Boulder Creek Wind Farm
VM Act	<i>Vegetation Management Act 1999</i> (Queensland)
WONS	Weeds of National Significance

1. Introduction

1.1 Background

The Boulder Creek Wind Farm (the Project), proposed by Boulder Creek Wind Farm Pty Ltd and BCWF 2 Pty Ltd (collectively referred to as BCWF), was approved by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 30 June 2022 (EPBC 2020/8772). A variation for a revised Project footprint was approved on 9 August 2024 which allows the construction and operation of up to 59 turbines in two stages (Stage 1 and Stage 2). A subsequent variation request was approved on 7 August 2025 to accommodate Project design refinements, resulting in a decrease in the Project's proposed disturbance footprint of 3.01 ha.

The Project is located 40 kilometres (km) south-west of Rockhampton and 5 km west of Mount Morgan. The Project area occurs along the eastern boundary of the Brigalow Belt South bioregion and within the Mount Morgan Ranges sub-region. The Project area covers a total of 14,925 hectares (ha) as illustrated in **Figure 1-1**.

As outlined in the EPBC Act approval the Project must not clear more than 517.41 ha (3.47% of the Project area). The Project has been approved to be constructed in two stages. Stage 1 has been prioritised based on current market conditions and site factors, including proximity to the grid.

To compensate for the significant residual impact of the Project on two Matters of National Environmental Significance (MNES), koala (*Phascolarctos cinereus*) habitat and *Cycas megacarpa* habitat, environmental offsets are required to be delivered in accordance with the Project's EPBC Act approval conditions. The Boulder Creek Wind Farm Environmental Offset Strategy (EOS) (EMM, 2023) was prepared to address Condition 5 of the EPBC Act approval, which identified an initial offset investigation area located adjacent to the Project area as a suitable site for Project offsets. The EOS was approved by DCCEEW on 1 June 2023. The initial offset investigation area identified in the EOS was refined based on additional field surveys and feedback from DCCEEW and the Stage 1 Boulder Creek Wind Farm Offset Area (Stage 1 BCOA) was identified. The location of the Stage 1 BCOA in relation to the Project area is illustrated in **Figure 1-1**.

The original Stage 1 Offset Area Management Plan (Stage 1 OAMP) (EMM, 2024) for the Stage 1 BCOA was prepared and approved on 19 September 2024. The Stage 1 OAMP identified the management, monitoring, auditing and reporting measures that must be undertaken to achieve the interim milestones and completion criteria. On commencing implementation of the Stage 1 OAMP on 13 January 2025, it was identified that several amendments were required to:

- reorganise and restructure the document to improve readability and overall implementation
- refine offset boundaries to reflect changes to the varied Project footprint
- incorporate results of baseline surveys undertaken in 2025
- ensure the offset area outcomes (interim milestones and completion criteria) reflect the baseline condition
- refine the monitoring and reporting program.

As a result of these changes, this revised Stage 1 OAMP was prepared and supersedes the previous version.

1.2 Purpose and scope

This revised Stage 1 OAMP is a practical document that addresses Condition 7 of the EPBC Act approval and outlines what must be done to manage the Stage 1 BCOA, including monitoring and reporting requirements. The Stage 1 OAMP includes:

- a detailed description of the offset area
- baseline survey results
- a description of the threats to MNES
- offset area outcomes to be achieved including performance targets, interim milestones and completion criteria
- the adaptive management framework including risk assessments and identification of corrective actions
- the management program to be implemented
- the monitoring program to be implemented
- reporting and data management requirements
- the implementation schedule for management, monitoring and reporting

1.3 Relevant approval conditions

The Stage 1 OAMP addresses the Project’s approval conditions (EPBC 2020/8772) as outlined in **Table 1.1**.

Table 1.1 Relevant EPBC Act approval conditions

Condition No.	Requirements	Reference
6	The provision of offsets may be staged so as to offset the actual impact of Stage 1 and Stage 2.	This OAMP addresses Stage 1 Project impacts only.
7	Prior to commencing implementation of Stage 1, the approval holder must submit to the department, for the approval of the Minister, an Offset Area Management Plan (OAMP) proposing the environmental offset area(s) for koala habitat and <i>Cycas megacarpa</i> habitat for Stage 1 that meets the requirements of the Environmental Offsets Policy.	The Stage 1 OAMP (EMM, 2024) was approved on 19 September 2024.
8	The approval holder must:	The Stage 1 OAMP (EMM, 2024) was approved on 19 September 2024.
	a) not commence the action until the Stage 1 OAMP has been approved by the Minister	
	b) commence implementing the approved Stage 1 OAMP upon commencement of the action	Implementation of the Stage 1 OAMP commenced on 13 January 2025.
	c) continue implementing the approved OAMP for the remaining duration of the approval.	The OAMP will be implemented for the duration of approval.
9	The Stage 1 approved OAMP must:	This OAMP has been prepared by suitably qualified ecologists (SQEs) as outlined in Appendix D .
	a) be prepared by a suitably qualified ecologist (SQE)	
	b) include the information specified in Attachment B (described below)	See response to Attachment B below.

Condition No.	Requirements	Reference
	<p>c) be attached to the legal mechanism used to secure Stage 1 BCOA. Each Stage 1 BCOA must be secured within 12 months of the commencement of the action. The approval holder must notify and provide evidence to the department within 5 business days of any Stage 1 BCOA being secured.</p>	<p>As outlined in Section 7.1, the Stage 1 BCOA will be secured by a voluntary declaration and the Stage 1 OAMP will be attached to the Declared Area Management Plan (DAMP).</p>
10	<p>To ensure that the Stage 1 offsets required for koala habitat and <i>Cycas megacarpa</i> habitat provide a conservation gain in accordance with the EPBC Act Environmental Offsets Policy, the completion criteria specified in the approved OAMP:</p> <p>a) must be achieved within 20 years of the commencement of the action</p> <p>b) once achieved, must be maintained or improved for the remaining duration of the approval.</p>	<p>Completion criteria that will be achieved in 20 years are presented in Section 5.</p> <p>The completion criteria will be maintained for the duration of the approval.</p>
11	<p>The approval holder must, within 40 business days of the 20th anniversary of the commencement of the action:</p> <p>a) submit to the department a report detailing the area and condition of koala habitat and <i>Cycas megacarpa</i> habitat in all offset area(s) specified in the approved Stage 1 OAMP</p> <p>b) notify the department in writing of any completion criteria at any offset area(s) specified in the approved Stage 1 OAMP that have not been achieved and the likely reasons that these completion criteria have not been met.</p>	<p>A final report will be submitted to DCCEEW within 40 business days of the 20th anniversary of the commencement of the action to confirm completion criteria are met.</p> <p>Written notification will be provided to DCCEEW should any completion criteria not be achieved and the likely reasons that these completion criteria have not been met.</p>
Attachment B: Each OAMP must include:		
a	<p>A summary of the residual impacts to Koala habitat and <i>Cycas megacarpa</i> habitat that will be compensated for by the environmental offset. This summary must include the final impact area to be offset of Koala habitat and <i>Cycas megacarpa</i> habitat at all impact sites which the particular offset is to address.</p>	<p>Summary of significant residual impacts related to the Stage 1 OAMP are presented in Section 1.4.</p>
b	<p>Details of the management actions, and timeframes for implementation, to be undertaken to achieve the offset completion criteria specified in the OAMP as required under conditions 10 and 17, including but not limited to:</p>	<p>Interim milestones are presented in Section 5.1.</p>
	<p>i. Interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria</p>	
	<p>ii. Details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones and maintaining improvements of habitat quality (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the environmental offset is likely to achieve those milestones in adequate time to implement any necessary corrective actions)</p>	<p>The habitat quality assessment monitoring program is presented in Section 8.5.</p>
<p>iii. Timing for the implementation of corrective actions if monitoring activities indicate the interim milestones will not be, or have not been, achieved</p>	<p>Corrective actions and associated timing for implementation are presented in Section 9.</p>	

Condition No.	Requirements	Reference
	<p>iv. A risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including weed and feral animal management, management of potential wildfires and a rating of all initial and post-mitigation residual risks in accordance with the risk assessment matrix</p> <p>v. Evidence of how the management actions and corrective actions consider relevant approved conservation advice and are consistent with relevant recovery plans and threat abatement plans.</p>	<p>The risk assessment for the implementation of the Stage 1 OAMP is presented in Appendix B.</p> <p>Consistency of the Stage 1 OAMP with the relevant conservation advices, recovery plans and threat abatement plans is presented in Appendix G.</p>
c	A description of the environmental offset site(s), including location, size, condition, environmental values present and surrounding land uses	The offset area description is presented in Section 2 .
d	the mechanism by which the environmental offset site will be secured	The legally binding mechanism is described in Section 7.1 .
e	baseline data, including results from field validation surveys, and quantifiable ecological data on habitat quality, and other supporting evidence, that documents the presence of Koalas and <i>Cycas megacarpa</i> and the quality of Koala habitat and <i>Cycas megacarpa</i> habitat within the environmental offset site	Baseline survey results data is presented in Section 2.8 , Section 2.9 and Section 3 .
f	details of how the environmental offset will provide connectivity with other habitats, populations and biodiversity corridors and/or will contribute to a larger strategic offset for Koala and <i>Cycas megacarpa</i>	Connectivity is described in Section 2.5 .
g	maps and shapefiles to clearly define the location and boundaries of the environmental offsets, accompanied by offset attributes; and	Figure 2-4 and Figure 2-5 illustrate the boundaries of the Stage 1 BCOA. Shapefiles have also been provided.
h	specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of Koala habitat and <i>Cycas megacarpa</i> habitat within the environmental offset sites over the period of effect of this approval required to meet the requirements of the Environmental Offsets Policy	Completion criteria are presented in Section 5.1 .

1.4 Summary of residual impacts

The environmental assessment and conditions of EPBC 2020/8772 have determined that a significant residual impact to two MNES is likely, namely the koala and *Cycas megacarpa*, as a result of clearing associated with Stage 1 of the Project. There is 360.01 ha of koala habitat and 136.08 ha of *Cycas megacarpa* habitat proposed to be cleared in Stage 1 of the Project (**Table 1-2**).

The area of Stage 1 clearing presented in this OAMP are based on a revised Project disturbance footprint (refer Figure 1.1) developed by BCWF as part of the detailed design. The revised footprint has a slightly reduced impact on koala habitat, and a slightly larger administrative impact for *Cycas megacarpa* due to more detailed cycad surveys being conducted across the full footprint area and additional records being identified. Footprint

reductions were able to be achieved compared with what was originally approved¹ as a result of the strategic micro siting of wind turbine generators (WTGs), the removal of one WTG and refinement of access tracks.

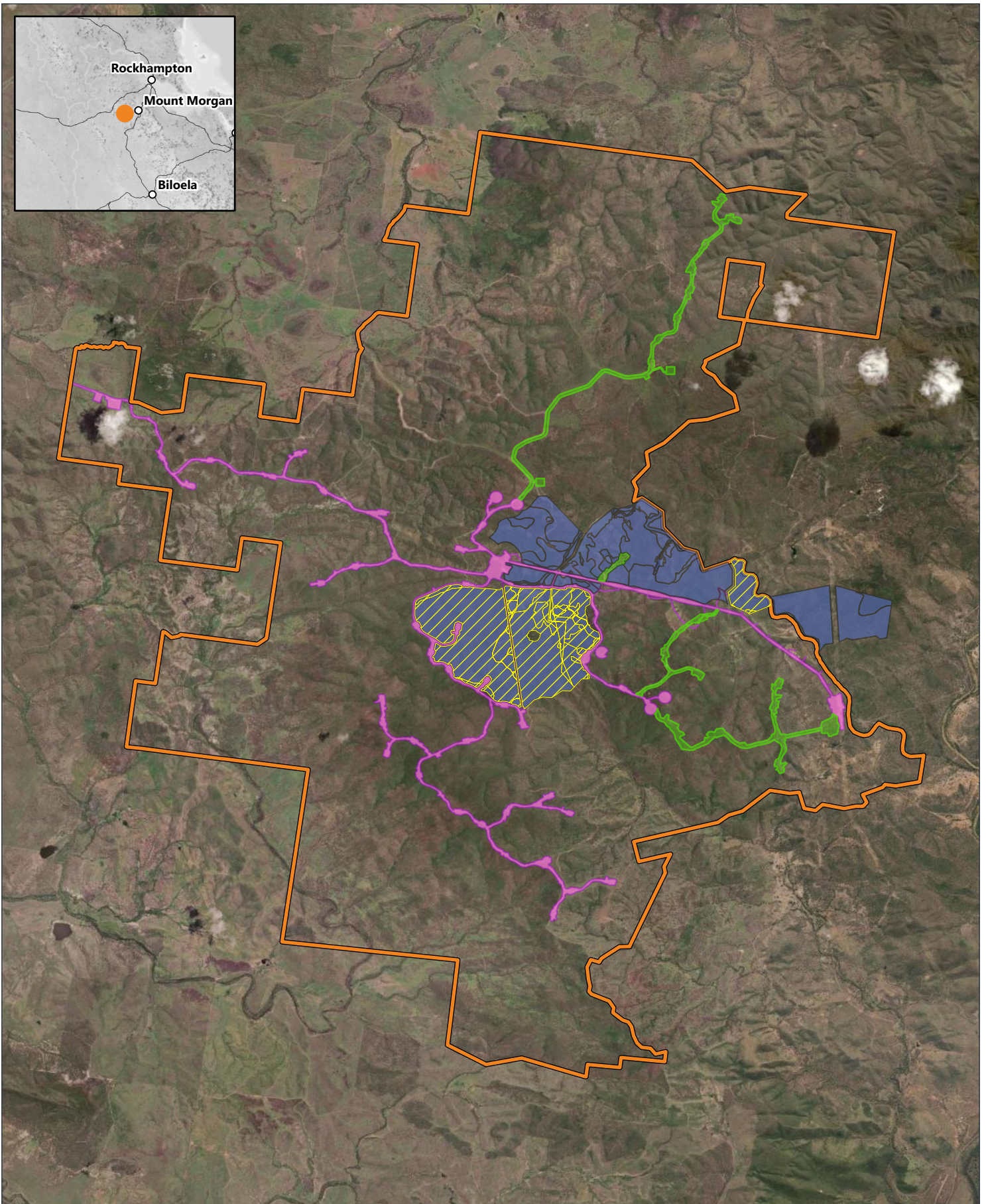
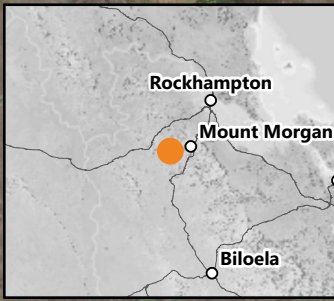
No koalas were detected during targeted surveys within the Project disturbance footprint. However, evidence of their presence has been recorded along creek lines adjacent to the Project and scats were observed in close proximity to the proposed BCOA during offset site surveys. The paucity of previous records and contemporary evidence along with the quality of habitat suggests the presence of a low-density koala population in the broader landscape encompassing the BCOA.

Large numbers of *Cycas megacarpa* were identified during targeted surveys both in the Project disturbance footprint and adjacent areas including the BCOA. The Project area is a part of the larger Mount Morgan cycad population and was determined to support a ‘significant population’ under the EPBC Act (EMM, 2021).

Table 1-2 Stage 1 Project impacts

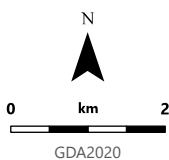
Target matter	Conservation status		Stage 1 clearing (ha)	Offset delivery mechanism
	EPBC Act	NC Act		
<i>Cycas megacarpa</i>	Endangered	Endangered	136.08	Land based offset
Koala habitat	Endangered	Endangered	360.01	Land based offset

¹ A EPBC Act amendment application was submitted to DCCEE and approved which updates the disturbance limits from what was originally approved.



Boulder Creek
Wind Farm
Stage 1 BCOA location
Figure 1-1

DWG No: AUL-004-003[D]
DATE: 18/03/2026
DRAWN: DC
REVIEWED: SC
SCALE (A4): 1:100,000



- Project Area
- Stage 1
- Stage 2
- Stage1 Cycas Megacarpa Offset Area
- Stage1 Koala Offset Area
- Major Watercourse
- Minor Water Course

2. Offset area description

2.1 Overview

The Stage 1 BCOA is 1,279.3 ha in size and is located within the Rockhampton Regional Council Local Government Area (LGA), approximately 10 km southwest of the town of Mount Morgan and 40 km southwest of Rockhampton. The Stage 1 BCOA comprises two distinct offset areas as illustrated in **Figure 1-1** including:

- 1,279.3 ha of koala offsets (100% of the Stage 1 BCOA is the koala offset area)
- 606.1 ha of *Cycas megacarpa* offsets (47% of the Stage 1 BCOA is the *Cycas megacarpa* offset area)

At a landscape scale, the Stage 1 BCOA is situated within the Mount Morgan Ranges biogeographic subregion of the Brigalow Belt Bioregion, and within the Fitzroy catchment area spanning the boundary of the Dawson River drainage sub-basin and the Fitzroy River drainage sub-basin. The Stage 1 BCOA is bordered by Boulder Creek in the north.

2.2 Tenure and ownership

The Stage 1 BCOA is located across three freehold property titles held by three separate landowners as presented in **Table 2.1**.

Table 2.1 Land tenure

Lot on Plan	Ownership	Tenure	Area within the Stage 1 BCOA (ha)
46RN245	Landowner 1	Freehold	634.86
44RN245	Landowner 2	Freehold	479.24
61RN309	Landowner 3	Freehold	165.15

2.3 Summary of historical survey effort

A range of ecological field surveys were conducted within the Project area and the Stage 1 BCOA to confirm the suitability of the offset and inform the development of the Stage 1 OAMP. Surveys undertaken between 2020 and 2025 included:

- vegetation community surveys to validate regional ecosystems (REs)
- surveys specifically targeting MNES matters being offset
- habitat quality assessments
- fence, access track and firebreak inspections
- general observations about land use and overall condition.

Due to the proximity of the Stage 1 BCOA to the Project area, the survey effort for the Stage 1 BCOA considers the survey effort undertaken for the Project environmental assessments and development of the *Cycas megacarpa* Translocation Management Plan (CMTMP) (Ecologica, 2024).

Project surveys for koala involved over 700 hours survey effort. Koala surveys (diurnal searches and nocturnal spotlighting) were conducted in April 2020 within and adjacent to the Project area. These surveys focused

primarily on the ephemeral riparian channels within and adjacent to the impact area including Boulder Creek, Sandy Creek and Plumtree Creek. Offset area specific surveys were carried out between July and September 2023. As described in **Section 2.8**, only indirect evidence of koala presence was detected in the Project and offset area during these surveys (scats and scratches).

A threatened flora survey was conducted within the disturbance footprint and buffer to record, assess and tag all *Cycas megacarpa* that occurred and identify which individuals could be translocated, and those that could not and why. Where a *Cycas megacarpa* was observed, detailed information was collected on the health of the individual and coordinates recorded at its location. These surveys were conducted over a total of 47 days and provide a detailed understanding of the presence of populations in the disturbance footprint, but also where they are located in relation to the Stage 1 BCOA.

Specific *Cycas megacarpa* surveys were also undertaken in September 2023 across representative areas of the Stage 1 BCOA, including within nominated recipient sites for translocation, to confirm their presence in the Stage 1 BCOA. Baseline surveys for *Cycas megacarpa* were also undertaken in 2025 and the results of these surveys are presented in **Section 3.5**.

2.4 Land use

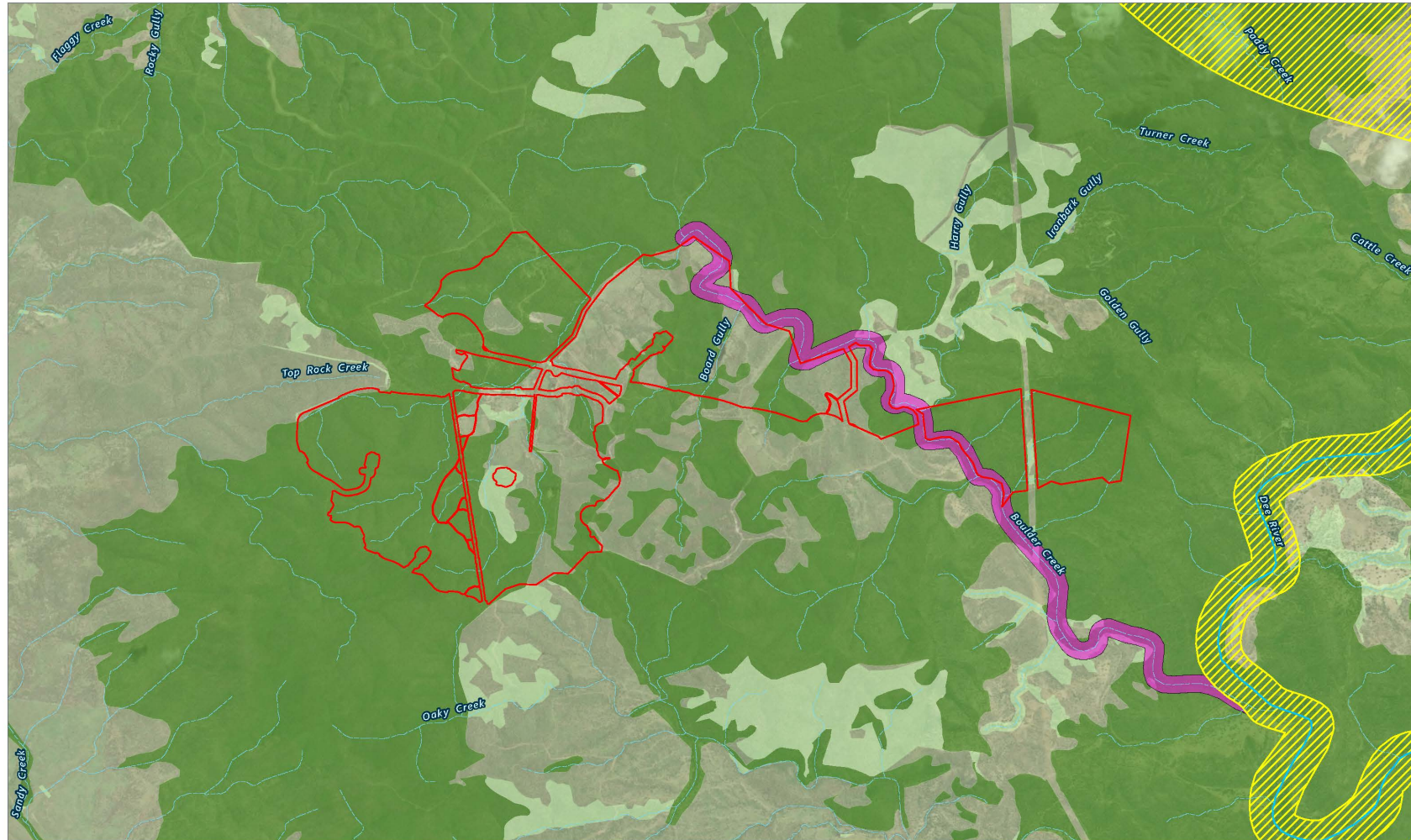
The Stage 1 BCOA has historically been used for low-density livestock grazing. Access tracks and fence lines occur throughout the Stage 1 BCOA; as well as an existing powerline easement that runs north to south through the eastern portion of the offset area, although this easement is excluded from the offset area. Permanent water sources within the Stage 1 BCOA primarily consist of farm dams and a few scattered pools along Boulder Creek.

Land surrounding the Stage 1 BCOA largely consists of densely vegetated areas of similar landform and slope, on large rural zoned properties. The surrounding land use is mostly limited to livestock grazing and native forestry. Historical clearing has also occurred in the region for agriculture mostly on the lower hills and floodplains. The Project will be developed adjacent to the Stage 1 BCOA as illustrated in **Figure 1-1**.

The township of Mount Morgan is approximately 10 km to the east and has a population of around 2,500 people. The town was historically a gold mine town with 99 years of gold mining occurring in the region commencing in 1882.

2.5 Connectivity

As illustrated in **Figure 2-1**, the Stage 1 BCOA is strategically located adjacent to large tracts of eucalypt woodlands that provide connectivity for wildlife and suitable habitat for koala and *Cycas megacarpa*. A State-mapped riparian corridor, Boulder Creek (Stream Order 4), intersects the Stage 1 BCOA and a second, larger riparian corridor, the Dee River (Stream Order 5), borders the eastern boundary of the Stage 1 BCOA. The Dee River connects the Stage 1 BCOA through the town of Mount Morgan to a State-mapped terrestrial biodiversity corridor.



Boulder Creek
Wind Farm

Stage 1 BCOA connectivity
Figure 2-1

DWG No: AUL-004-004[B]
DATE: 11/11/2025
DRAWN: DC
REVIEWED KM
SCALE (A4): 1:40,000



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- | | | | |
|----------------------|-------------------------------|----------------------|--------------------|
| Project Area | Biodiversity Corridor buffers | Vegetation Condition | Major Watercourse |
| Offset area boundary | State | Regrowth | Minor Water Course |
| | Regional | Non-remnant | |



Figure 2-1 Stage 1 BCOA connectivity

2.6 Climate

Climatic conditions in the Mount Morgan region are typical of Central Queensland’s inland-coastal transition, that is hot, humid summers with most rainfall concentrated in the December–March period, and milder, relatively dry winters (June–August). Mean annual rainfall for the region is on average between 700 and 850 mm (monthly peaks in summer).

Historical climatic data for the Mount Morgan region is presented in **Table 2.2** and **Figure 2-2**. Rainfall data was obtained from the Moonmera BOM weather station (weather station #039067) which is located approximately 7 km north of the Mount Morgan township. Temperature data for the Mount Morgan region was obtained from the Rockhampton aerodrome BOM weather station (weather station #039083) which is located approximately 30 km north-east of the Mount Morgan township.

Table 2.2 Mean rainfall and mean maximum and minimum temperatures

Data	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mean precipitation (mm)²	130.8	133.0	87.8	44.7	36.8	37.2	31.9	23.5	23.5	50.7	66.5	111.8
Mean max temperature (°C)³	32.1	31.5	30.7	28.9	26.1	23.6	23.3	25.0	27.6	29.8	31.3	32.2
Mean min temperature (°C)	22.3	22.2	21.0	18.1	14.3	11.1	9.8	10.9	13.9	17.2	19.6	21.3

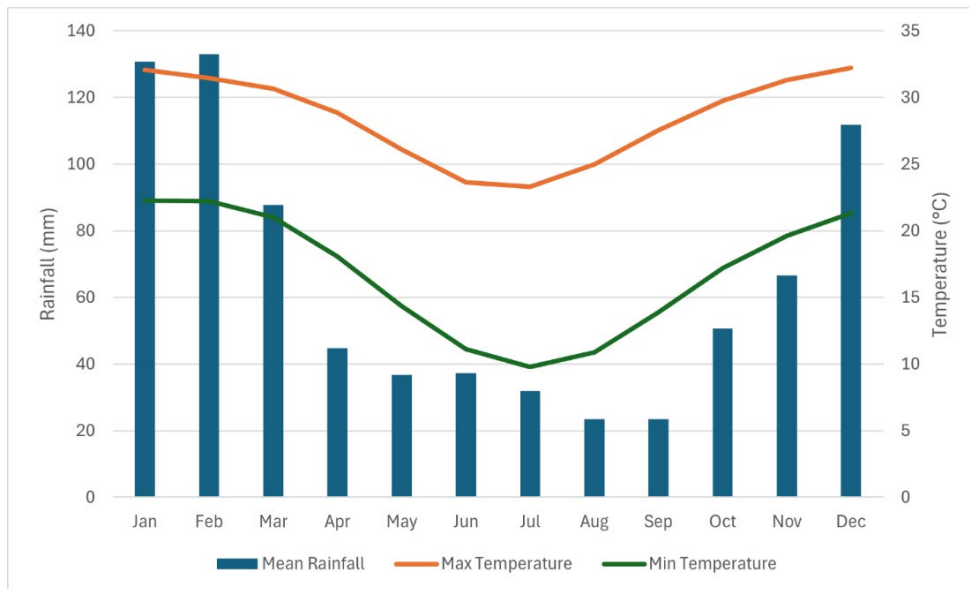


Figure 2-2 Mean rainfall and mean maximum and minimum temperatures

² Rainfall averages presented are from years 1901 to 2025.

³ Maximum and minimum temperature averages presented are from years 1939 to 2025.

2.7 Regional ecosystems

Ground-truthed RE (GTRE) mapped within the Stage 1 BCOA are summarised in **Table 2.3** and illustrated on **Figure 2-3**. The Stage 1 BCOA consists primarily of remnant vegetation (i.e. 78.7%) with a smaller area of regrowth woodland (11.2%). Most of the regrowth woodland is advanced and supports canopy tree species and a well-developed shrub layer. The remaining 10.1% of the Stage 1 BCOA comprises cleared areas.

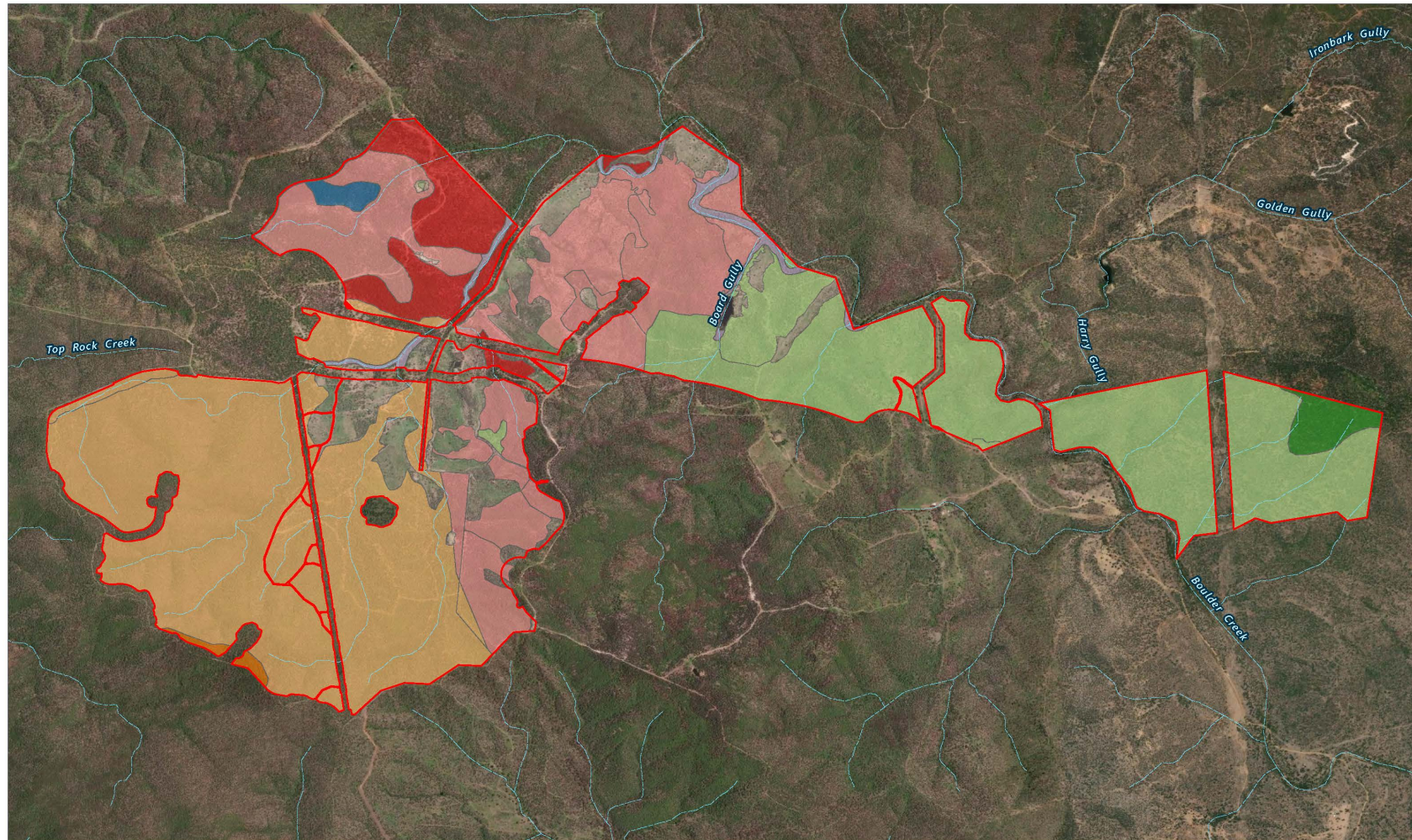
The large, contiguous tracts of remnant vegetation predominantly comprise narrow-leaved ironbark (*Eucalyptus crebra*) and spotted gum (*Corymbia citriodora*) woodland on rocky, undulating rises and low hills. The understorey generally supports canopy species recruits, grasstrees (*Xanthorrhoea* spp.), cycads (including *Cycas megacarpa* and *Macrozamia* species) and native grasses.

Table 2.3 Regional ecosystems mapped within the Stage 1 BCOA

GTRE	VM Act Status	Condition	Short Description	Total Area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
11.3.25	Least concern	Remnant	Blue gum (<i>E. tereticornis</i>) riparian woodland on narrow alluvial channel. Melaleuca spp., Casuarina spp. and Acacia spp. in the subcanopy. Ground layer composed of canopy species recruits, lantana and native grasses.	18.1	18.1	0.00
11.11.1	Least concern	Remnant	Narrow-leaved ironbark woodland (<i>E. crebra</i>) with rosewood (<i>Acacia rhodoxylon</i>) and associated spotted gum (<i>C. citriodora</i>) in the canopy. Cycads (<i>Macrozamia</i> spp.) present in the shrub layer.	7.0	7.0	0.00
11.11.15	Least concern	Remnant	Narrow-leaved ironbark (<i>E. crebra</i>) and red bloodwood (<i>C. erythrophloia</i>) woodland to open woodland. Pockets of associated canopy species such as silver-leaved ironbark (<i>E. melanophloia</i>), Moreton Bay ash (<i>C. tessellaris</i>) and peppermint (<i>E. exserta</i>) were recorded throughout the narrow-leaved ironbark dominant woodland. Typically	280.3	280.3	40.7

GTRE	VM Act Status	Condition	Short Description	Total Area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
			found on sloping, low hills.			
11.11.15	Least concern	Regrowth	Regrowth woodland is similar in species composition to that of remnant; however, the canopy is less than 70% of the benchmark height.	34.3	34.3	8.6
11.11.15	Least concern	Non-remnant	Cleared for cattle grazing and access tracks.	40.2	40.2	37.5
11.12.6	Least concern	Remnant	<i>Corymbia citriodora</i> open forest on igneous rocks (granite)	4.3	4.3	4.3
11.11.4	Least concern	Remnant	<i>Eucalyptus crebra</i> woodland +/- <i>Corymbia citriodora</i> +/- <i>E. tereticornis</i> +/- <i>C. tessellaris</i> +/- <i>Lophostemon suaveolens</i> with <i>Xanthorrhoea</i> spp. and <i>Macrozamia</i> spp. often present in shrub layer.	162.1	162.1	32.0
11.11.4	Least concern	Regrowth	<i>Lophostemon</i> sp. dominant layer (~5 m tall), with emergent narrow-leaved ironbark, peppermint and/or bloodwood. Cycads and grasstrees (<i>Xanthorrhoea</i> spp.), lantana and native grass species present in the understorey.	109.2	109.2	35.9
11.11.4	Least concern	Non remnant	Cleared for cattle grazing and access tracks.	89.0	89.0	26.0
11.11.4c	Least concern	Remnant	<i>Eucalyptus moluccana</i> dominated woodland. Other tree species listed for RE 11.11.4 below may occur as sub or co-dominant species. Occurs on undulating rises and low hills, on moderately to strongly deformed and metamorphosed sediments and interbedded volcanics	69.1	69.1	0.00

GTRE	VM Act Status	Condition	Short Description	Total Area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
			and Permian sediments.			
11.12.1	Least concern	Remnant	Narrow-leaved ironbark (<i>E. crebra</i>) and red bloodwood (<i>C. erythrophloia</i>) woodland on ranges on igneous rocks.	448.7	448.7	421.2
11.11.3	Least concern	Remnant	Spotted gum (<i>C. citriodora</i>) and narrow-leaved ironbark (<i>E. crebra</i>) open forest.	17.0	17.0	0.00
Total area (ha)				1,279.3	1,279.3	606.1



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Stage 1 BCOA regional ecosystems
Figure 2-3

Offset area boundary

- | | | |
|----------|-------------|--------------------|
| 11.11.1 | 11.12.1 | Major Watercourse |
| 11.11.15 | 11.12.6 | Minor Water Course |
| 11.11.3 | 11.3.25 | |
| 11.11.4 | Non-remnant | |
| 11.11.4c | | |

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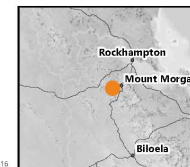


Figure 2-3 Stage 1 BCOA regional ecosystems

2.8 Koala offset area

The koala habitat offset area is approximately 1,279 ha in size and is illustrated on **Figure 2-4**. Youngentob et al. (2021) describe koala foraging requirements in terms of Locally Important Koala Trees (LIKTs) which are defined as tree species regularly browsed by koalas in specific Koala Management Bioregions (KMBs), such that the tree species could be considered a substantial portion of the koala’s diet. As described in **Table 2.4**, the Stage 1 BCOA contains more than 1,000 ha of remnant and regrowth eucalypt woodlands containing one or more LIKTs. The most dominant LIKT is narrow-leaved ironbark (*Eucalyptus crebra*). In addition, ancillary habitat trees, which may not be preferred browse trees but are important for koala habitat (e.g. shelter trees), feature in most vegetation communities within the Stage 1 BCOA.

Habitat connectivity within the Stage 1 BCOA and between neighbouring habitats is high. Contiguous eucalypt woodland and riparian corridors, such as Boulder Creek and nearby Dee River, function as movement corridors connecting the resources within the Stage 1 BCOA to adjacent habitat types to support koalas at the individual scale and the population level. Boulder Creek features pools of permanent water, LIKTs, and is likely to be a key movement corridor for koalas. It is characterised by a wide rocky bed with often steep rocky banks. Mature blue gums (*Eucalyptus tereticornis*) are scattered along the corridor amongst the more predominant *Melaleuca* and *Allocasuarina* species.

Despite the occurrence of suitable habitat, no evidence of koala was recorded (either by direct or indirect observation) during surveys in April 2020. Subsequent targeted spring surveys in 2020 identified koala scratches on blue gum (*Eucalyptus tereticornis*) and spotted gum (*Corymbia citriodora*) along the creek lines located just north-east of the Project area and the Stage 1 BCOA. During surveys in September 2023 koala scats were recorded in eucalypt woodland under a *Eucalyptus exserta* (peppermint) tree in close proximity to the Stage 1 BCOA (**Photo 1**). Further targeted surveys were not deemed to be required given it was known that koalas occurred in proximity to the Stage 1 BCOA, and suitable habitat was present. However, the overall paucity of records and the quality of available habitat suggest the population density of koalas within the Stage 1 BCOA, the impact area and the surrounding landscape is low.



Photo 1: Koala scats observed within the Stage 1 BCOA in September 2023 under a peppermint (*Eucalyptus exserta*)

Table 2.4 Koala LIKT and ancillary habitat trees within the Stage 1 BCOA

GTRE	Condition	LIKT (Dominant or Co-dominant in the Canopy)	Ancillary Habitat Trees	Area (ha)
11.3.25	Remnant	• Blue gum (<i>Eucalyptus tereticornis</i>)	-	18.1
11.11.1	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Spotted gum (<i>Corymbia citriodora</i>)	7.0
11.11.3	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Spotted gum (<i>Corymbia citriodora</i>)	17.0
11.11.4	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Spotted gum (<i>Corymbia citriodora</i>)	162.1
	Regrowth	• Gum-topped box (<i>Eucalyptus moluccana</i>)	• Moreton bay ash (<i>Corymbia tessellaris</i>)	109.2
	Non remnant			89.0
11.11.4c	Remnant	• Grey box (<i>Eucalyptus moluccana</i>)	-	69.1
11.11.15	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Moreton bay ash (<i>Corymbia tessellaris</i>)	280.3
	Regrowth	• Peppermint (<i>Eucalyptus exserta</i>)	• Red bloodwood (<i>Corymbia erythrophloia</i>)	34.3
	Non remnant	• Silver-leaved ironbark (<i>E. elanopholia</i>)		40.2
11.12.1	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Red bloodwood (<i>Corymbia erythrophloia</i>)	448.7
11.12.6	Remnant	• Narrow-leaved ironbark (<i>Eucalyptus crebra</i>)	• Spotted gum (<i>Corymbia citriodora</i>)	4.3
Total koala habitat in Stage 1 BCOA (ha)				1,279.3

2.9 *Cycas megacarpa* offset area

The *Cycas megacarpa* offset area is approximately 606 ha in size and comprises existing populations of the species and large areas of suitable habitat. The offset area also includes the Project *Cycas megacarpa* recipient areas, where translocated *Cycas megacarpa* and propagated seeds will be planted. The location of the *Cycas megacarpa* offset area within the broader Stage 1 BCOA is illustrated on **Figure 2-5**.

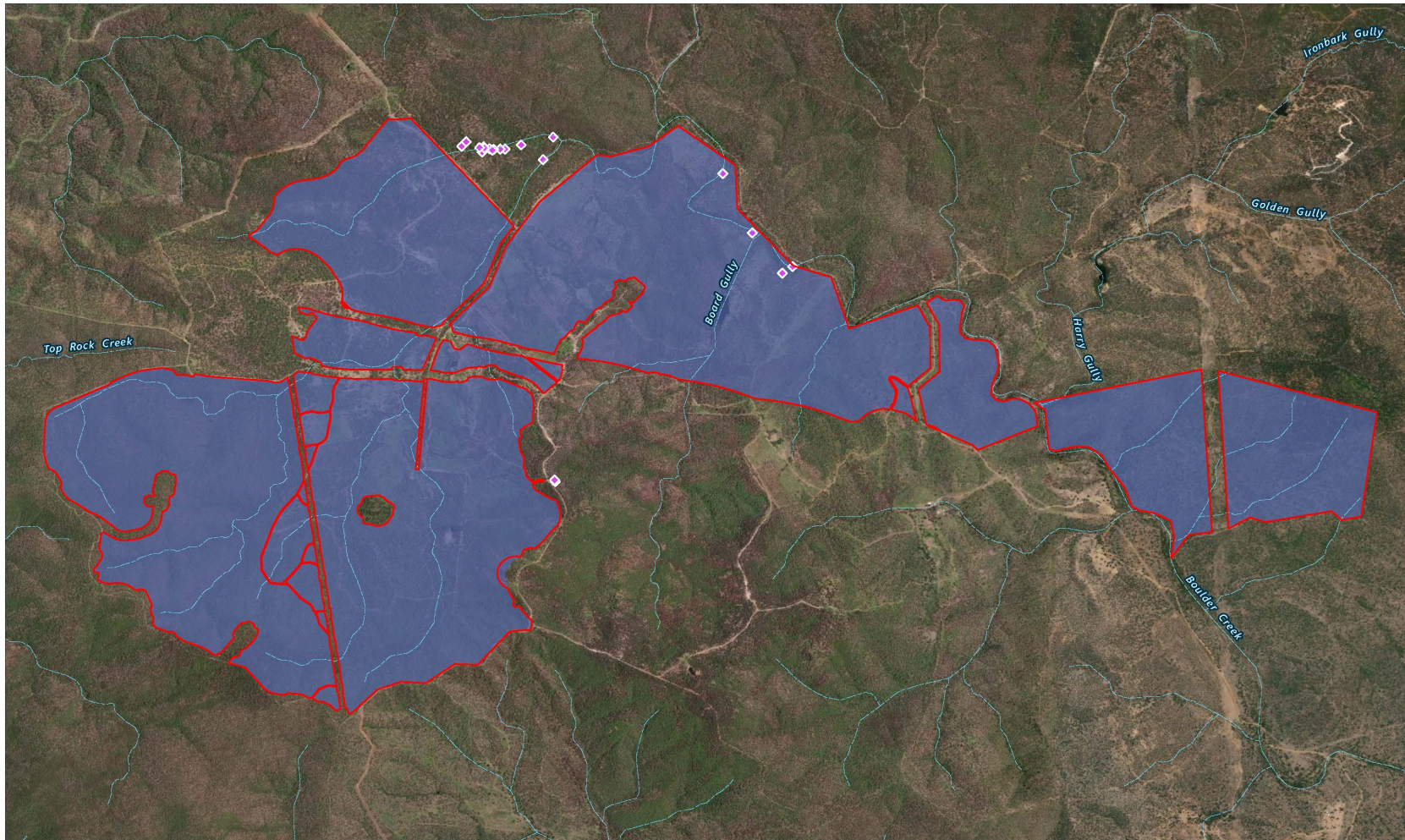
As illustrated on **Figure 2-5**, large numbers of *Cycas megacarpa* were identified during targeted surveys both in the Project disturbance footprint and adjacent areas including the Stage 1 BCOA, with the confirmed numbers of individuals exceeding 5,000. Survey results indicate there is a large population of the species at Boulder Creek, which represents a new local population within the species' known distributional range. The population is healthy showing signs of recruitment. It exhibits a diverse population structure including adults (5 to 8 m tall), reproductive aged (>1 m) individuals and juveniles (<50 cm) (Queensland Herbarium, 2007).

There are other known populations of *Cycas megacarpa* in the local region which are part of the Mount Morgan population. The survey data indicates that this new population at Boulder Creek is highly likely to form part of the significant and viable meta population associated with Mount Morgan (Population 3) which is estimated at about 160,000 individuals. Adding the Boulder Creek population (which encompasses the full Project area and the Stage 1 BCOA) could exceed 200,000 individuals.

2.9.1 *Cycas megacarpa* translocation management plan

Information on the cycad recipient areas are included in the approved *Cycas megacarpa* translocation management plan CMTMP (Ecologica, 2024). It identifies the management actions and completion criteria for the salvage, propagation, and translocation of *Cycas megacarpa* to fulfil conditions 25 to 32 of the Project's EPBC Act approval. The CMTMP provides specific assessment, management, monitoring and reporting measures to be implemented prior to, during and after translocation. It details the key CMTMP actions including:

- the salvage and relocation of individuals from the Stage 1 Disturbance Footprint to permanent recipient sites
- seed collection
- propagation of individuals under nursery conditions prior to planting out
- planting out of tubestock and field management
- maintenance of translocated and planted individuals
- monitoring and reporting obligations.



Boulder Creek
Wind Farm

Koala offset area
Figure 2-4

- Offset area boundary
- Stage1 Koala Offset Area
- ◆ Koala records
- Minor Water Course

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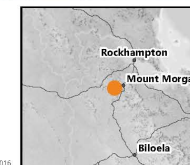
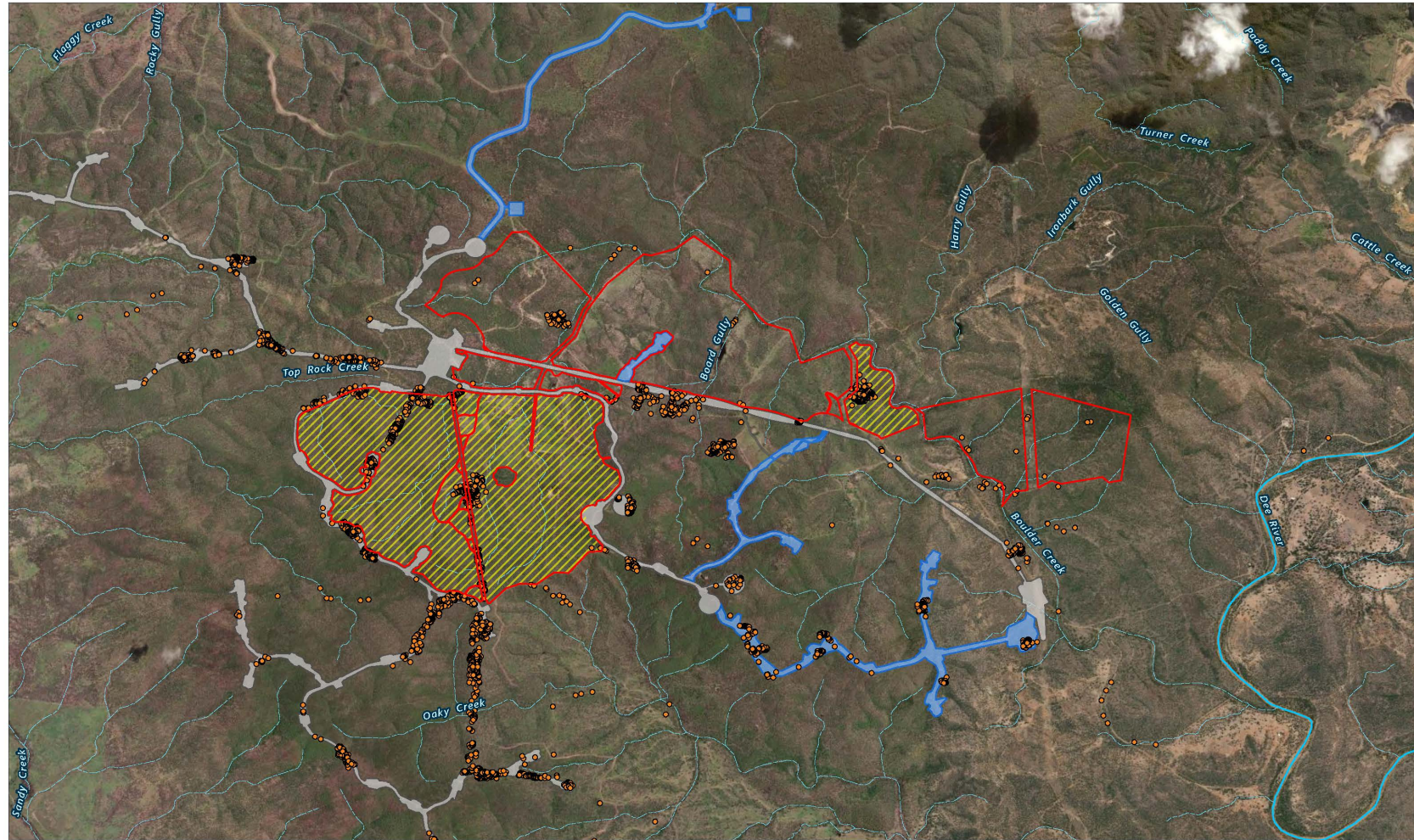


Figure 2-4 Koala offset area



Boulder Creek
Wind Farm

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Cycas megacarpa offset area
Figure 2-5

- Offset area boundary
- Proposed Disturbance Footprint
- Stage 1
- Stage 2
- Cycas megacarpa record (EMM)
- Stage1 Cycas Megacarpa Offset Area
- Major Watercourse
- Minor Water Course

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Figure 2-5 *Cycas megacarpa* offset area

3. Baseline survey results

The original Stage 1 OAMP (EMM, 2024) included a monitoring program with commitments to undertake a range of baseline surveys in Year 1 including habitat quality assessments, weed surveys, pest animal surveys and *Cycas megacarpa* surveys. These surveys, as well as a fire risk assessment, were undertaken in 2025 and the methods, results and data produced were documented in the Baseline Survey Report – Year 1 (Attexo, 2025a). A summary of the results of the Baseline Survey Report is presented below. It is important to note that the original Stage 1 OAMP (EMM, 2024) also included a commitment to undertake baseline targeted surveys for koala, however, these surveys were not required to be completed until Year 2, and at the time of writing have not been completed.

3.1 Re-mapping assessment units

The original Stage 1 OAMP (EMM, 2024) reported 11 assessment units (AUs), however, there are 12 AUs located within the offset area based on the different RE and broad condition states mapped in the GTRE data. As such, the AU mapping was updated and the revised areas are described in **Table 3.1** and illustrated on **Figure 3-1**. Revisions to the AU mapping resulted in the establishment of new monitoring sites as described below.

3.2 Establishing monitoring sites

Prior to undertaking baseline surveys in 2025, survey sites presented in the original Stage 1 OAMP (EMM, 2024) were refined and, where required, relocated to ensure that:

- all sites are located within the Stage 1 BCOA (noting many sites in the original Stage 1 OAMP were not located in the offset area),
- each AU has a representative number of survey sites, and
- each species-specific offset area has a representative number of survey sites.

As presented in **Table 3.1** and illustrated on **Figure 3-1**, there are 36 permanent monitoring sites located within the Stage 1 BCOA. All 36 sites are located within the koala offset area, and 16 of the sites are located within the *Cycas megacarpa* offset area. These sites are utilised for habitat quality assessments, weed cover surveys and *Cycas megacarpa* surveys.

During the Year 1 surveys in 2025, each permanent monitoring site was marked using two survey pegs, one at the start of the transect and one at the halfway point of the transect. Survey pegs were chosen with consideration of safety to both livestock and people, as well as future visibility. At the start of the transect (0 m), a blue plastic and steel peg was hammered flush with the ground (**Photo 2**). At the transect halfway point (50 m) a 45 cm galvanised steel picket was hammered into the ground with approximately 20 cm of the post protruding above ground (**Photo 2**). At all monitoring locations, the trip hazard of the survey pegs used was significantly lower than the similar hazard of the surround rocks, and woody debris. GPS coordinates for all survey sites are presented in Baseline Survey Report (Attexo 2025a).



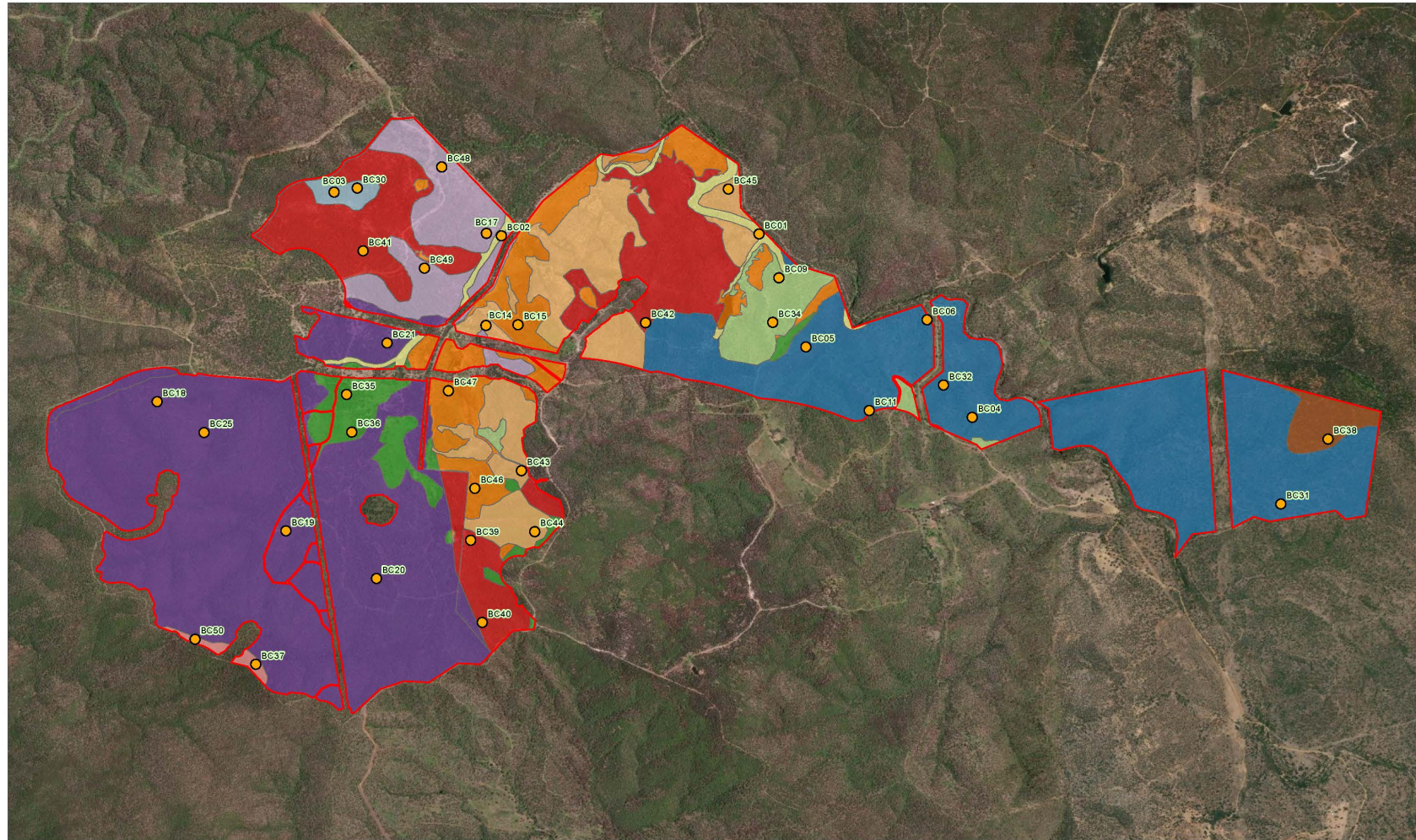
Photo 2: Survey pegs at start (0 m) and mid-point (50 m) of permanent monitoring sites

Table 3.1 Stage 1 BCOA assessment units and survey sites

AU	Survey Site	Number Survey Sites	GTRE	VM Act Status	Condition	Total Area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
1	BC1, BC2	2	11.3.25	Least concern	Remnant	18.1	18.1	0.00
2	BC3, BC30	2	11.11.1	Least concern	Remnant	7.0	7.0	0.00
3	BC4(C), BC5, BC6, BC11, BC31, BC32(C)	6	11.11.15	Least concern	Remnant	280.3	280.3	40.7
4	BC9, BC34, BC50(C)	3	11.11.15	Least concern	Regrowth	34.3	34.3	8.6
5	BC35(C), BC36(C)	2	11.11.15	Least concern	Non-remnant	40.2	40.2	37.5
6	BC37(C)	1	11.12.6	Least concern	Remnant	4.3	4.3	4.3
7	BC39(C), BC40(C), BC41, BC42	4	11.11.4	Least concern	Remnant	162.1	162.1	32.0
8	BC14, BC43(C), BC44(C), BC45	4	11.11.4	Least concern	Regrowth	109.2	109.2	35.9
9	BC15, BC46 (C), BC47 (C)	3	11.11.4	Least concern	Non-remnant	89.0	89.0	26.0
10	BC17, BC48, BC49	3	11.11.4c	Least concern	Remnant	69.1	69.1	0.00

AU	Survey Site	Number Survey Sites	GTRE	VM Act Status	Condition	Total Area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
11	BC18(C), BC19(C), BC20(C), BC21, BC25(C),	5	11.12.1	Least concern	Remnant	448.7	448.7	421.2
12	BC38	1	11.11.3	Least concern	Remnant	17.0	17.0	0.00
Total		36	-	-	-	1,279.3	1,279.3	606.1

(C) The subset of the koala survey sites located within the *Cycas megacarpa* offset area.



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Stage 1 BCOA assessment units and survey sites
Figure 3-1

- Survey Site
 - Offset area boundary
- | | | |
|----------------------------------|--|---|
| Offset Area Assessment Unit (AU) | <ul style="list-style-type: none"> 4 5 6 7 8 | <ul style="list-style-type: none"> 9 10 11 12 |
|----------------------------------|--|---|

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Figure 3-1 Stage 1 BCOA assessment units and survey sites

3.3 Weed presence and abundance

Weed cover was assessed at 35 sites during the Year 1 survey. As described in the Baseline Survey Report (Attexo, 2025a), no data was collected at BC50 in Year 1 as the need for this site was only identified during the post field survey data analysis. At the next scheduled monitoring event, data will be collected at BC50, and results updated accordingly.

A total of 42 weed species were identified across the Stage 1 BCOA. Whilst most of these species averaged a total cover of 1% (30 species out of 42), there are a few species that are more common and abundant throughout the Stage 1 BCOA.

The weed species most frequently recorded (based on number of sites the weed was recorded at) are presented in **Table 3.2**. The most commonly recorded species was *Lantana camara*, which was found at all 35 sites with an average cover of 20% across all sites. The site with the highest cover of *Lantana camara* was BC02, with total cover of 75%. The second most frequently recorded species was *Melinis repens* (Natal grass), which was recorded at 23 sites with an average cover of 15% across all sites. The third most frequently recorded species was *Lantana montevidensis* which was recorded at 22 sites with an average cover of 7% across all sites.

Weed species with the highest average cover are presented in **Table 3.3** and illustrated in **Photo 3**. In addition to the species listed above there are three species with average cover greater than 5%; *Cenchrus setaceus*, *Chamaecrista rotundifolia* and *Bryophyllum delagoense*.

The complete results of the baseline weed cover survey is presented in **Table 3.4**. This provides a summary of each weed species identified across the Stage 1 BCOA, the sites they were identified at, and their respective percentage (%) cover. An average weed cover has been calculated for each species. The results of the baseline survey are also illustrated on **Figure 3-2**. Photo-monitoring results from the weed surveys, taken at each site, are presented in the Baseline Survey Report – Year 1 (Attexo, 2025a).

Table 3.2 Weed species most frequently recorded

Weed Species	Number of Sites Weed Recorded	Average Cover %
<i>Lantana camara</i> (Lantana)	35	20.29
<i>Melinis repens</i> (Red natal grass)	23	15.09
<i>Lantana montevidensis</i> (Creeping lantana)	22	6.86
<i>Ageratum houstonianum</i> (Blue billygoat weed)	13	2.38
<i>Opuntia streptacantha</i> (Prickly pear)	21	2.14
<i>Calyptocarpus vialis</i> (Creeping cinderella weed)	29	1.59
<i>Glandularia aristigera</i> (Mayne’s Pest)	12	1.33
<i>Malvastrum americanum</i> (Spiked malvastrum)	12	1.25
<i>Opuntia tomentosa</i> (Velvety tree pear)	15	1.13
<i>Opuntia stricta</i> (Common pest pear)	16	1.00
<i>Sida rhombifolia</i> (Paddy’s Lucerne)	18	1.00
<i>Stylosanthes scabra</i> (Shrubby stylo)	10	1.00

Table 3.3 Weed species within highest average cover (%)

Weed Species	Number of Sites Weed Recorded	Average Cover %
<i>Lantana camara</i> (Lantana)	35	20.29
<i>Melinis repens</i> (Red natal)	23	15.09
<i>Cenchrus setaceus</i> (Crimson fountaingrass)	2	9
<i>Chamaecrista rotundifolia</i> (Round-leafed cassia)	5	8
<i>Lantana montevidensis</i> (Creeping lantana)	22	6.86
<i>Bryophyllum delagoense</i> (Mother-of-millions)	2	5.5



Lantana (*Lantana camara*)



Red Natal Grass (*Melinis repens*)



Crimson fountaingrass (*Cenchrus setaceus*)



Round-leaved cassia (*Chamaecrista rotundifolia*)

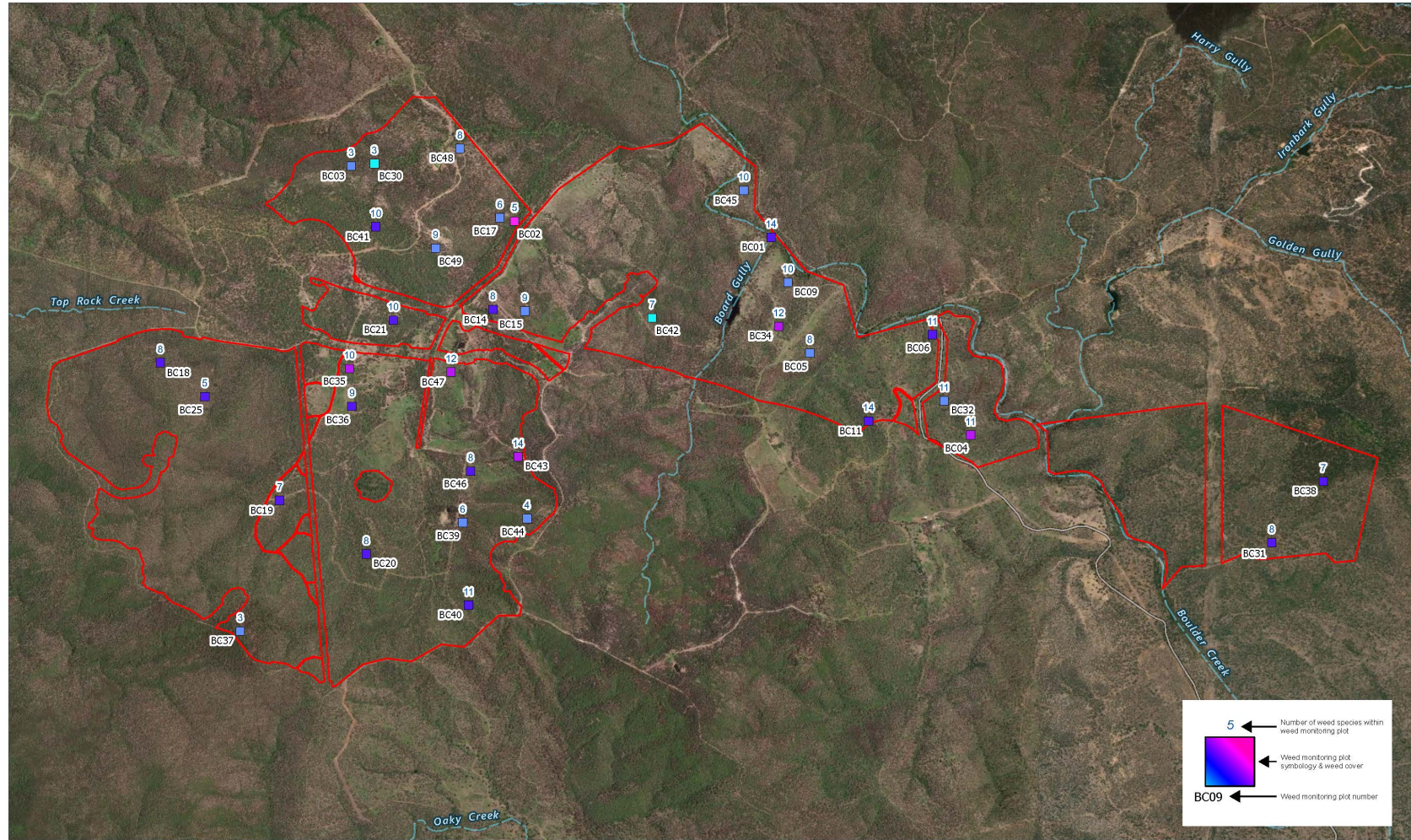


Mother-of-millions (*Bryophyllum delagoense*)



Creeping lantana (*Lantana montevidensis*)

Photo 3: Dominant weed species present within the offset area



5 ← Number of weed species within weed monitoring plot

← Weed monitoring plot symbology & weed cover

BC09 ← Weed monitoring plot number



Stage 1 BCOA baseline weed cover data
Figure 3-2

Offset area boundary

Total Weed Cover (%)

- <20
- 21 - 40
- 41 - 60
- 61 - 80
- 81 - 100

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Figure 3-2 Stage 1 BCOA baseline weed cover data

3.4 Pest animal activity

A total of 11 camera traps were deployed across the Stage 1 BCOA during the Year 1 surveys, resulting in a total of 338 trap nights. Following the analysis of all imagery, a total of three pest fauna species were recorded, including wild dogs (*Canis lupus dingo*) (**Photo 4**), feral cat (*Felis catus*) (**Photo 5**) and European hare (*Lepus europaeus*) (**Photo 6**). A summary of the pest animal activity is provided in **Table 3.5**, **Table 3.6**, **Table 3.7** for these species, respectively.

The analysis of these observations resulted in a baseline Catling Index Value of 2.37 for wild dogs, 0.89 for feral cats and 0.30 for European hares.

Table 3.5 Baseline wild dog survey results

Confirmed Incidence of Wild Dogs From a Given AU												
Site	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU11	Catling Index
Trap nights	39	40	45	45	39	38	40	42	39	39	38	2.37
Day 2	X											
Day 6		X			X							
Day 8		X										
Day 9							X					
Day 11							X					
Day 13	X											
Day 24	X											

Table 3.6 Baseline feral cat survey results

Confirmed Incidence of Feral Cats From a Given AU												
Site	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU11	Catling Index
Trap nights	39	40	45	45	39	38	40	42	39	39	38	0.89
Day 3	X											
Day 13	X											
Day 28	X											

Table 3.7 Baseline European hare survey results

Confirmed incidence of European hare from a given AU												
Site	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU11	Catling Index
Trap nights	39	40	45	45	39	38	40	42	39	39	38	0.30
Day 30	X											



Photo 4: Camera trap image of wild dog within the BCOA



Photo 5: Camera trap image of feral cat within the BCOA



Photo 6: Camera trap image of European hare within the BCOA

3.5 *Cycas megacarpa*

Cycas megacarpa targeted surveys were undertaken in Year 1 to record species occurrence and recruitment. A total of 15 survey sites were established across the *Cycas megacarpa* offset area. A total of five sites were found to have *Cycas megacarpa* present, with a total of 165 individuals detected. The majority of these individuals (137) had an above ground stem and were classified as sub-adult (some were also fruiting - **Photo 7**). A total of 28 seedlings (**Photo 8**) were identified within the survey areas. Only one of the monitoring locations (BC32) had sub-adults with no seedlings, with all other sites showing active signs of recruitment. *C. megacarpa* density varied across these sites with BC25 and BC19 having more than twice the number of individuals of any other site. A summary of these observations is provided in **Table 3.8**.

Table 3.8 Baseline *Cycas megacarpa* survey results

BC	Sub-adult	Seedling	Total
BC4	13	1	14
BC18	0	0	0
BC19	36	9	45
BC20	1	3	4
BC25	68	15	83
BC32	19	0	19

BC	Sub-adult	Seedling	Total
BC35	0	0	0
BC36	0	0	0
BC37	0	0	0
BC39	0	0	0
BC40	0	0	0
BC43	0	0	0
BC44	0	0	0
BC46	0	0	0
BC47	0	0	0
BC50*	-	-	-
Total	137	28	165

*BC50 was not assessed during the Year 1 event but will be established for subsequent monitoring events.



Photo 7: Cycas megacarpa sub-adult observed within the BCOA



Photo 8: Cycas megacarpa seedlings observed within the BCOA

3.6 Fire risk assessment

Fireland Consultancy were engaged in 2025 to undertake an audit of the offset areas against the fire management components of the original Stage 1 OAMP and provide preliminary recommendations for works to support fire management within offset sites. This included an initial site inspection of the Stage 1 BCOA from the 17th to 19th of June 2025. The risk assessment provided a range of general observations for each of the offset areas as well as recommendations for actions.

3.7 Koala habitat quality

Following corrections to AUs and the establishment of permanent monitoring sites within the Stage 1 BCOA in Year 1 (2025), habitat quality assessments were undertaken and the habitat quality scores were recalculated. Koala habitat quality assessments were undertaken in accordance with the Boulder Creek Offset Area Modified Habitat Quality Assessment Method (BCOA MHQA method) (Attexo, 2025b) presented in **Appendix A**. Detailed results of these assessments are presented in the Baseline Survey Report – Year 1 (Attexo, 2025a) and associated datasets. The information presented below provides a summary of the results including revised baseline scores in **Section 3.7.4**.

3.7.1 Site condition

As outlined in the BCOA MHQA method, the site condition indicator is primarily based on 13 pre-determined floristic and structural field attributes. The method also incorporates two supplementary scoring attributes when assessing fauna species site condition, collectively referred to as species habitat indices (SHI):

- Quality and availability of food and foraging habitat
- Quality and availability of shelter.

Scoring for SHI relies on the development of species-specific parameters informed by the ecological requirements of each species as outlined in the Stage 1 BCOA MHQA method.

A summary of the site condition scores for each AU for the koala offset area are presented in **Table 3.9**.

Table 3.9 Koala offset area site condition scores

AU	GTRE	Condition	Site Condition Score (out of 100)	Site Condition Score (out of 3)
1	11.3.25	Remnant	72.0	2.16
2	11.11.1	Remnant	61.3	1.84
3	11.11.15	Remnant	62.5	1.88
4	11.11.15	Regrowth	48.8	1.46
5	11.11.15	Non-remnant	48.0	1.44
6	11.12.6	Remnant	64.5	1.94
7	11.11.4	Remnant	60.0	1.80
8	11.11.4	Regrowth	48.0	1.44
9	11.11.4	Non remnant	35.3	1.06
10	11.11.4c	Remnant	65.0	1.95
11	11.12.1	Remnant	62.4	1.87
12	11.11.3	Remnant	71.0	2.13
Average Site Condition Score			58.23	1.75

3.7.2 Site context

Detailed methods for scoring site context attributes are presented in the BCOA MHQA method in **Appendix A**. The attributes assessed and the associated scores for the koala offset area are shown in **Table 3.10**.

Table 3.10 Koala offset area site context scores

Attribute	Assessment Scale	Maximum Score	Koala Offset Area Score	Score Justification
Size of patch	Matter Area	10	10	In accordance with the BCOA MHQA methods (Appendix A), the size of the Matter Area for Koala and any connecting remnant vegetation was >200ha, and as such received a score of 10.
Connectedness	Matter Area	5	4	In accordance with the BCOA MHQA methods (Appendix A), approximately 60.3% of the Matter Area is directly connected to suitable habitat for Koala, and as such received a score of 4.
Context	Matter Area	5	4	In accordance with the BCOA MHQA methods (Appendix A) and using a buffer distance of 10 km for Koala, approximately 43.7% of this context buffer contains remnant vegetation. As such, this attribute received a score of 4.
Ecological Corridors	Matter Area	6	4	In accordance with the BCOA MHQA methods (Appendix A), the offset area was found to share a boundary with a regional biodiversity corridor, and as such received a score of 4.
Role of site location to species/TEC overall population in the state	Matter Area	5	5	In accordance with the BCOA MHQA methods (Appendix A), the suitable habitat mapped for Koala within the offset site meets the definition of <i>habitat critical to the survival of the species</i> , and as such received a score of 5.
Threats	Matter Area	15	1	In accordance with the BCOA MHQA methods (Appendix A), threats were assessed using the dog activity index (2.37 as shown in Table 3.5) and the % cover of lantana (20% as shown in Table 3.4). Both attributes scored a 1, which resulted in an overall threat score of 1 for Koala.
Species mobility capacity (fauna only)	Matter Area	10	7	In accordance with the BCOA MHQA methods developed for the Project (Appendix A), mobility capacity for Koala is directly linked to % cover of lantana (20% as shown in Table 3.4). As such this attribute received a score of 7.
Total Score		56	35	
Site Context Score (out of 3)		-	1.88	

3.7.3 Species stocking rate

Detailed methods for scoring species stocking rate (SSR) attributes are presented in the BCOA MHQA method in **Appendix A**. The attributes assessed and associated scores for the Koala offset area are shown in **Table 3.11**.

Table 3.11 Koala offset area species stocking rate scores

Attribute	Assessment Scale	Maximum Potential Score	Koala Offset Area Score	Score Justification
Presence detected on or adjacent to site	Matter Area	10	5	Koala scats were identified within the Project area during surveys in 2023, indicating their presence in areas adjacent to the offset area. In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 5.
Species usage of the site	Matter Area	15	15	Habitat within the Stage 1 BCOA meets the requirements of breeding habitat for the koala. In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 15.
Approximate density (per ha)	Matter Area	30	10	The koala scats recorded within the Project area represent the only koala record that occurs within this species' context buffer (10 km). In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 10.
Role/importance of species population on site*	Matter Area	15	0	This locally occurring koala population was not considered to represent a key source population for breeding or dispersal, nor is it located at the limit of this species range, nor is it necessary for maintaining genetic diversity. As such, this attribute received a score of 0.
Total Score	Matter Area	70	30	-
SSR Score (out of 4)	Matter Area	4	1.71	-

3.7.4 Habitat quality score

A summary of the results of the Year 1 habitat quality score for the koala offset area are presented in **Table 3.12**. The final area weighted habitat quality score for koala in Year 1 is 5.35. This habitat quality score is less than that presented in the original Stage 1 OAMP, which was 5.70 (EMM, 2024). However, it is important to note that these results are not strictly comparable to those presented in the original Stage 1 OAMP (EMM, 2024) as many of the survey sites were relocated to ensure they were in the offset area itself, and the new data from these sites has been used to determine the Year 1 score.

Table 3.12 Summary of Year 1 habitat quality scores for koala offset area

Indicator	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU11	AU12	AVG
Site Condition score (out of 3)	2.16	1.84	1.88	1.46	1.44	1.94	1.80	1.44	1.06	1.95	1.87	2.13	
Site context score (out of 3)	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	1.88	
Species Stocking Rate (out of 4)	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Habitat Quality Score (out of 10)	5.75	5.43	5.46	5.05	5.03	5.52	5.39	5.03	4.65	5.54	5.46	5.72	5.34
Assessment Unit area (ha)	18.13	7.05	280.28	34.33	40.17	4.25	162.13	109.17	89.00	69.13	448.66	16.97	
Total offset area (ha)	1,279.27												
Size Weighting	0.01	0.01	0.22	0.03	0.03	0.00	0.13	0.09	0.07	0.05	0.35	0.01	
Weighted Habitat Quality Score	0.08	0.03	1.20	0.14	0.16	0.02	0.68	0.43	0.32	0.30	1.92	0.08	5.35

3.7.5 Offsets assessment guide

To determine the suitability of the proposed offset area for koala, the EPBC Act Offsets Assessment Guide calculator was completed. A summary of the calculator inputs is provided in **Table 3.13**. A copy of the calculator outputs is provided in **Appendix E**, with justifications in **Appendix F**. The 1,279.3 ha of koala habitat within the Stage 1 BCOA meets and exceeds the EPBC Offsets Assessment Guide requirements (117%) for the clearing of 360.1 ha.

Table 3.13 Stage 1 koala offsets assessment guide inputs

Attribute	Value
Quality of impact area	5
Quality of offset area	5
Future quality without offset	5
Future quality with offset	7
Confidence in result – future quality (%)	80%
Risk of loss without offset (%)	3%
Risk of loss with offset (%)	0%
Confidence in result – risk of loss (%)	80%
Time over which loss is averted (years)	20
Time until ecological benefit (years)	20
% of impact offset	117%
Impact area	360.01 ha
Offset area	1,279.3 ha

3.8 *Cycas megacarpa* habitat quality

Following corrections to AUs and the establishment of permanent monitoring sites within the Stage 1 BCOA in Year 1 (2025), habitat quality assessments were undertaken, and the habitat quality scores were recalculated. *Cycas megacarpa* habitat quality assessments were undertaken in accordance with the BCOA MHQA Method (Attexo, 2025b) presented in **Appendix A**. Detailed results of these assessments are presented in the Baseline Survey Report – Year 1 (Attexo, 2025a) and associated datasets. The information presented below provides a summary of the results.

3.8.1 Site condition

As outlined in the BCOA MHQA method, assessing the site condition indicator for flora species is based on 13 pre-determined floristic and structural field attributes. A summary of the site condition scores for each AU for the *Cycas megacarpa* offset area are presented in **Table 3.12**.

Table 3.14 *Cycas megacarpa* offset area site condition scores

AU	GTRE	Condition	Site Condition Score (out of 100)	Site Condition Score (out of 3)
3	11.11.15	Remnant	51.0	1.91
4	11.11.15	Regrowth	-	-
5	11.11.15	Non-remnant	41.0	1.54
6	11.12.6	Remnant	54.5	2.04
7	11.11.4	Remnant	46.5	1.74
8	11.11.4	Regrowth	43.5	1.63
9	11.11.4	Non remnant	36.3	1.36
11	11.12.1	Remnant	52.0	1.95
Average Site Condition Score			46.4	1.74

3.8.2 Site context

Detailed methods for scoring site context attributes are presented in the BCOA MHQA method in **Appendix A**. The attributes assessed and the associated scores for the *Cycas megacarpa* offset area are shown in **Table 3.15**.

Table 3.15 *Cycas megacarpa* offset area site context scores

Attribute	Assessment Scale	Maximum Score	Cycad Offset Area Score	Score Justification
Size of patch	Matter Area	10	10	In accordance with the BCOA MHQA methods (Appendix A), the size of the Matter Area for <i>Cycas megacarpa</i> and any connecting remnant vegetation was >200ha, and as such received a score of 10.
Connectedness	Matter Area	5	4	In accordance with the BCOA MHQA methods (Appendix A), approximately 53.9% of the Matter Area is directly connected to suitable habitat for <i>Cycas megacarpa</i> , and as such received a score of 4.

Attribute	Assessment Scale	Maximum Score	Cycad Offset Area Score	Score Justification
Context	Matter Area	5	4	In accordance with the BCOA MHQA methods (Appendix A), and using a buffer distance of 1 km for <i>Cycas megacarpa</i> , approximately 62.3% of this context buffer contains remnant vegetation. As such, this attribute received a score of 4.
Ecological Corridors	Matter Area	6	4	In accordance with the BCOA MHQA methods (Appendix A), the offset area was found to share a boundary with a regional biodiversity corridor, and as such received a score of 4.
Role of site location to species/TEC overall population in the state	Matter Area	5	5	In accordance with the BCOA MHQA methods (Appendix A), all confirmed populations of <i>Cycas megacarpa</i> constitute <i>habitat critical to the survival of the species</i> , and as such received a score of 5.
Threats	Matter Area	15	1	In accordance with the BCOA MHQA methods (Appendix A), a single measurable threat was identified for this species, the potential for intense bushfires. During this assessment this threat scored a 1.
Total Score		46	28	
Site Context Score (out of 3)		-	1.83	

3.8.3 Species stocking rate

Detailed methods for SSR attributes are presented in the BCOA MHQA method in **Appendix A**. The attributes assessed and associated scores for the *Cycas megacarpa* offset area are shown in **Table 3.16**.

Table 3.16 *Cycas megacarpa* offset area species stocking rate scores

Attribute	Assessment Scale	Maximum Score	Cycad Offset Area Score	Score Justification
Presence detected on or adjacent to site	Matter Area	10	10	165 <i>Cycas megacarpa</i> individuals were identified within the BCOA during baseline surveys (Section 3.5). In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 10.
Number of plants	Matter Area	30	10	165 <i>Cycas megacarpa</i> individuals were identified within the BCOA during baseline surveys (Section 3.5). In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 10.
Extent of population	Matter Area	30	10	Recorded <i>Cycas megacarpa</i> individuals had an extent of approximately 0.02 ha (165 individuals multiplied by 1m ²). In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 10.
Approximate density (per ha)	Matter Area	20	5	<i>Cycas megacarpa</i> individuals were recorded at a density of approximately 20.6 individuals per ha during the baseline survey (165 individuals and 8 ha survey area). In accordance with the BCOA MHQA methods (Appendix A), this attribute received a score of 5.
Role/importance of species	Matter Area	15	15	The observed <i>Cycas megacarpa</i> population meets the definition of a key source population, it necessary for maintaining genetic diversity and it

Attribute	Assessment Scale	Maximum Score	Cycad Offset Area Score	Score Justification
population on site*				at the limit of this species distribution. As such, this attribute received a score of 15.
Total Score	Matter Area	105	50	
SSR Score (out of 4)	Matter Area	4	1.90	

3.8.4 Habitat quality score

A summary of the results of the Year 1 habitat quality score for the *Cycas megacarpa* offset area are presented in **Table 3.17**. The final area weighted habitat quality score for *Cycas megacarpa* in Year 1 is 5.60. This habitat quality score is less than that presented in the original Stage 1 OAMP, which was 6.34 (EMM, 2024).

However, it is important to note that these results are not strictly comparable to those presented in the original Stage 1 OAMP (EMM, 2024) as many of the survey sites were relocated to ensure they were in the offset area itself, and the new data from these sites has been used to determine the Year 1 score.

Table 3.17 Summary of Year 1 habitat quality scores of *Cycas megacarpa* offset area

Final habitat quality score (weighted)	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU11	AVG
Site Condition score (out of 3)	1.91	<i>TBC at next monitoring event</i>	1.54	2.04	1.74	1.63	1.36	1.95	
Site context score (out of 3)	1.83		1.83	1.83	1.83	1.83	1.83	1.83	
Species Stocking Rate (out of 4)	1.90		1.90	1.90	1.90	1.90	1.90	1.90	
Habitat Quality Score (out of 10)	5.64		5.27	5.77	5.47	5.36	5.09	5.68	5.47
Assessment Unit area (ha)	40.71		37.46	4.26	31.98	35.89	25.99	421.22	
Total offset area (ha) for this MNES	597.5		597.5	597.5	597.5	597.5	597.5	597.5	
Size Weighting	0.07		0.06	0.01	0.05	0.06	0.04	0.70	
Weighted Habitat Quality Score	0.388	0.00	0.33	0.04	0.29	0.32	0.22	4.00	5.60

*Note that, for the purpose of calculating the weighted habitat quality score for *Cycas megacarpa*, the total offset area for has been reduced by 8.6 ha to account for the exclusion of AU4 from the assessment

3.8.5 Offsets assessment guide

To determine the suitability of the proposed offset area for *Cycas megacarpa* the EPBC Act Offsets Assessment Guide was completed. A summary of the calculator inputs is provided in **Table 3.18**. A copy of the calculator outputs is provided in **Appendix E**, with justifications in **Appendix F**. The 610.1 ha of *Cycas megacarpa* habitat within the Stage 1 BCOA meets and exceeds the EPBC Offsets Assessment Guide requirements (120%) for the clearing of 136.08 ha habitat.

Table 3.18 Stage 1 *Cycas megacarpa* offsets assessment guide inputs

Attribute	Value
Quality of impact area	5
Quality of offset area	6
Future quality without offset	5
Future quality with offset	7
Confidence in result – future quality (%)	80%
Risk of loss without offset (%)	3%
Risk of loss with offset (%)	0%
Confidence in result – risk of loss (%)	80%
Time over which loss is averted (years)	20
Time until ecological benefit (years)	20
% of impact offset	120.68%
Impact area	136.08 ha
Offset area	606.1 ha

4. Threats to MNES

The key threats to koala and *Cycas megacarpa* within the offset area are:

- weeds
- pest animals
- vegetation clearing
- vehicle strike
- inappropriate or altered fire regimes

These threats are briefly discussed in the sections below.

4.1 Weeds

As presented in **Section 3.3**, a range of weed species were recorded across the Stage 1 BCOA in 2025. The most commonly recorded species was *Lantana camara*, which was recorded at all 35 sites with an average cover of 20% across all sites. The second most frequently recorded species was *Melinis repens* (Natal grass), which was recorded at 23 sites with an average cover of 15% across all sites. The third most frequently recorded species was *Lantana montevidensis* which was recorded at 22 sites with an average cover of 7% across all sites as presented in **Table 3.2**.

Weeds can impede the growth of native vegetation by outcompeting regenerating plants, and species such as *Lantana camara* can increase the intensity of bushfires. Dense thickets of lantana can reduce habitat quality for koala by reducing recruitment of canopy tree species and hindering species mobility. Lantana also contributes to biomass which can increase the risk of a high intensity bush fire. Hot and extensive bushfires are a recognised high-level threat to koalas and their habitat (DAWE, 2022; DCCEEW, 2022). It is also noted that dense areas of lantana can restrict growth of *Cycas megacarpa*.

4.2 Pest animals

As presented in **Section 3.4**, wild dogs, feral cats and European hare were recorded in the Stage 1 BCOA during baseline surveys. Feral pigs (*Sus scrofa*) are also known to be present within the adjacent Project area, and therefore likely to be present in the offset area. Koalas may encounter mortality with wild dogs within the BCOA. However, this is considered a minor threat due to the extent of remnant woodlands and connectivity of vegetation within the majority of the Stage 1 BCOA. It is likely koalas will have safe passage through the Stage 1 BCOA without the need to traverse along the ground for long distances (i.e. where they are most at risk).

Feral pigs may pose a threat to *Cycas megacarpa* as evidence of digging around plants was observed by EMM ecologists during survey of the Project disturbance footprint. Feral pigs have also been confirmed to cause damage to cycads during other *Cycas* translocation programs (M. Price, *pers comm.* 2023). Predation on seeds and injury to plants by feral pigs digging at their base can occur and evidence of this has been seen in Project area.

4.3 Vegetation clearing

The Stage 1 BCOA includes 136.1 ha of non-remnant areas. These areas are largely cleared of native vegetation and have historically been maintained by landholders for livestock grazing. There are also areas of regrowth vegetation in the Stage 1 BCOA at varying levels of maturity, which have been historically cleared. Timber within the Stage 1 BCOA has also been selectively harvested. These historical clearing and grazing regimes have altered flora species diversity and impacted habitat quality within the offset area. Clearing and degradation of habitat are recognised key threats to koala (DAWE, 2022; DCCEEW, 2022).

4.4 Vehicle strike

Encountering mortality with vehicles is a recognised threat to koalas (DCCEEW, 2022), although risk from vehicle strike is considered low within the Stage 1 BCOA given its location and the range of mitigation measures to be implemented at the Project area.

4.5 Inappropriate or altered fire regimes

Inappropriate or altered fire regimes, including too frequent, unplanned, uncontrolled and catastrophic bushfires have the potential to change ecological communities, allow weeds to spread and impact habitat for fauna and flora. These fires can occur because of:

- Deliberate or undeliberate ignition of a fire through human activities
- Higher than normal fuel loads due to a lack of fire in previous years, lack of mitigation, proliferation of weeds or higher than average rainfall.

Inappropriate or altered fire regimes are a recognised threat to both koala *and* *Cycas megacarpa* and are a key risk for both species within the Stage 1 BCOA. Hot fires can directly kill koalas and impact koala habitat. Fire is a natural part of cycad habitat and adult plants are tolerant of fire and able to resprout after fire events (Queensland Herbarium, 2007). A high intensity fire, however, can destroy the seed bank within the soil and seedlings. Cumulative seedling loss due to frequent fires, or hot fires, can trigger a decline in population size over time (Queensland Herbarium, 2007).

5. Offset area outcomes

The overall objective of the offset is to deliver a conservation outcome that improves or maintains the viability of the impacted protected matters - koala and *Cycas megacarpa*. This will be achieved through the improvement in habitat quality scores over a 20-year period, and the attainment of specific interim milestones and performance targets presented in **Section 5.1** and **5.2**. Once achieved, the completion habitat quality will be maintained for the duration of the approval.

The interim milestones, performance targets and completion criteria are based on the SMART goal framework. Each goal is:

- **Specific** – clear, well-defined and concise.
- **Measurable** – a quantifiable metric that can be tracked through the application of replicable methods of assessment and compared to a baseline.
- **Achievable** – realistic and attainable over the life of the offset.
- **Relevant** – relates specifically to the site-condition and site-context attributes that diminished the baseline habitat quality scores, and which can be improved upon through targeted management actions over time.
- **Time-bound** – they must be achieved within the clearly defined time intervals at 5, 10, 15 and 20 years.

5.1 Interim milestones and completion criteria

The interim milestones and completion criteria to be achieved are presented in **Table 5.1**.

Table 5.1 Interim milestones and completion criteria

MNES	Impact Area Habitat Quality: Prior to impact	Offset Area Habitat Quality: Baseline	Offset Area Interim Milestones				Completion Criteria
			Year 5	Year 10	Year 15	Year 20	
Koala	5	5.35 (5)	5.73	6.10	6.48	6.85 (7)	
<i>Cycas megacarpa</i>	5	5.60 (6)	5.98	6.35	6.73	7.10 (7)	

5.2 Performance targets

The performance targets required to achieve the interim milestones and completion criteria are presented in **Table 5.2**.

Table 5.2 Performance targets

Attribute	Year 5	Year 10	Year 15	Year 20	Justification	Species benefit
Average weed cover (all sites combined) – <i>Lantana camara</i>	<20%	≤15%	≤10%	≤5%	The most common weed species during baseline surveys was <i>Lantana camara</i> , which was recorded at all 35 sites with an average cover of 20% across all sites.	Reduction in lantana cover decreases fuel loads and the risk of high intensity bushfires. It also improves species mobility capacity for koalas.
Non-native plant cover	Increase the average score for non-native plant cover to 3 for both offset areas	Increase the average score for non-native plant cover to 5 for both offset areas	Increase the average score for non-native plant cover to 7 for both offset areas	Increase the average score for non-native plant cover to 9 for both offset areas	The average baseline non-native plant cover is 2.4 /10 for the koala offset area and 1.7/10 for the <i>Cycas megacarpa</i> offset area, indicating room for improvement over the 20-year management period.	Reduction in non-native plant cover results in an improvement of general ecological condition and can be related to decreased fuel loads.
Native grass cover – koala offset area	Increase the average score for native grass cover to 2.5	Increase the average score for native grass cover to 3	Increase the average score for native grass cover to 3.5	Increase the average score for native grass cover to 4	The average baseline score for native grass cover across the koala offset areas is 2/5, indicating room for improvement over the 20-year management period.	Increased native grass cover can be related to reduction in weed cover and improvement of general ecological condition.
Native grass cover – <i>Cycas megacarpa</i> offset area	Increase the average score for native grass cover to 2	Increase the average score for native grass cover to 3	Increase the average score for native grass cover to 3.5	Increase the average score for native grass cover to 4	The average baseline score for native grass cover across the <i>Cycas megacarpa</i> offset areas is 1/5, indicating room for improvement over the 20-year management period.	Increased native grass cover can be related to reduction in weed cover and improvement of general ecological condition.
Recruitment in BC36 and BC15	Increase recruitment of EDL species to 25% of the benchmark across all survey sites	Increase recruitment of EDL species to 50% of the benchmark across all survey sites	Increase recruitment of EDL species to 75% of the benchmark across all survey sites	Increase recruitment of EDL species to 100% of the benchmark across all survey sites	The score for recruitment at these survey sites is 0/5, indicating room for improvement over the 20-year management period.	Improved recruitment leads to increased future koala habitat trees and leads to improvements in number of large trees and canopy cover over time, becoming a foraging resource for koalas (canopy tree species >4 m height). Improved recruitment will also result in enhanced habitat quality for <i>Cycas megacarpa</i> .
Threats	-	Overall score 7/15	-	Overall score 15/15	The baseline threats score is 1/15 (high) for both offset areas. It is considered reasonable that the threats to the species after 20 years will be reduced to low (15) through the active management of bushfire risk, wild dogs and weeds.	Reduced threat to koala from wild dogs and improved mobility due to weed reduction. Reduction in the risk of high intensity fires due to reduced fuel loads (lantana) and active

Attribute	Year 5	Year 10	Year 15	Year 20	Justification	Species benefit
						fire management for both koala and <i>Cycas megacarpa</i> .

6. Adaptive Management

6.1 Process

The Stage 1 OAMP will be implemented based on an adaptive management process. This includes the iterative approach of learning and adapting the management program to facilitate improved management and decision-making over time in response to evolving knowledge, changing circumstances and uncertainty to ensure the offset area outcomes are achieved.

The effects of the management actions will be monitored as part of a comprehensive program in which the results will be assessed to adapt and correct future management actions as required. **Figure 6-1** provides a simple overview of the adaptive management process.

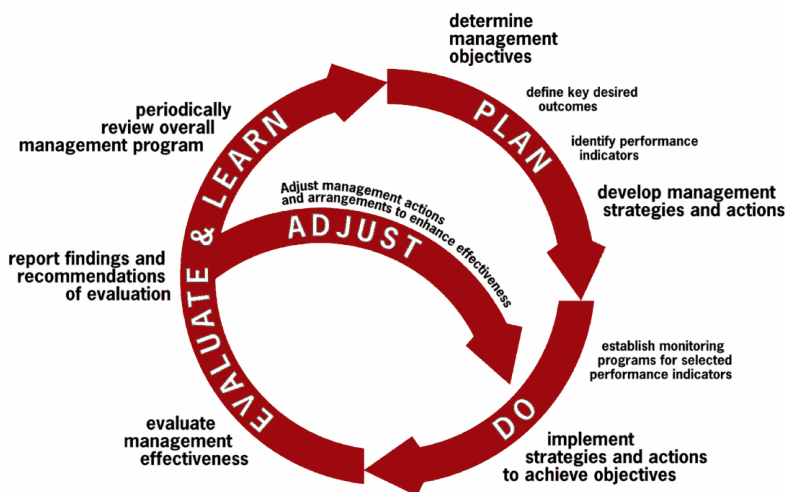


Figure 6-1 An example of the adaptive management cycle (Jones, 2005)

6.2 Risk assessment

A risk assessment has been prepared to evaluate the consequence and likelihood of identified threats impacting the achievement of offset area outcomes. The risk assessment process is an important component of the adaptive management cycle as it identifies both the initial and residual risk ratings (with and without management), as well as corrective actions to be implemented. The outcomes of the risk assessment have been used to inform development of the Stage 1 OAMP including the proposed management and monitoring program, and corrective actions. The risk assessment for the Stage 1 BCOA is presented in **Appendix B**. Corrective actions are summarised in **Section 9**.

6.3 Timing for implementation

The offset area will be managed and monitored until the completion criteria have been achieved which is anticipated to occur within the proposed 20-year management period. As identified in the risk assessment, in the event the completion criteria have not been achieved within anticipated timeframes, management and monitoring will continue in accordance with this OAMP until the completion criteria are met. The legally binding mechanism will continue to provide enduring protection of the offset area in perpetuity to prevent future clearing and loss of the offset area.

7. Management Program

The management program for the Stage 1 BCOA includes a range of activities aimed at specifically achieving the offset area outcomes listed in **Section 5**. Management activities are summarised in **Table 7.1**.

Table 7.1 Summary of management program activities

Management Activity	Management Requirement
Legal security of the offset area	Section 7.1
General restrictions	Section 7.2
Fencing and access	Section 7.3
Weed management	Section 7.4
Pest animal management	Section 7.5
Grazing management	Section 7.6
Fire management	Section 7.7

7.1 Legal security

The Stage 1 BCOA will be legally secured via a voluntary declaration made under the *Vegetation Management Act 1999* (VM Act). As per EPBC Act approval Condition 9(c), the Stage 1 BCOA must be legally secured within 12 months of the commencement of the action. The action commenced on 13 January 2025.

7.2 General restrictions

The restrictions listed in **Table 7.2** are to be adhered to when implementing the Stage 1 OAMP.

Table 7.2 Offset area restrictions

Restriction	Details
Unauthorised access or use	<ul style="list-style-type: none"> The offset area will be suitably fenced to restrict access. Vehicles permitted into the offset area must travel to track conditions to minimise risk of vehicle strike to fauna (e.g. koala) and maintain safety of personnel.
Vegetation clearing	<ul style="list-style-type: none"> Clearing of native vegetation will not be permitted in the offset area except as part of necessary management and monitoring activities under the OAMP including but not limited to: <ul style="list-style-type: none"> Maintenance of access tracks and fire breaks Management of fuel loads Fence construction and maintenance Ensuring public safety or as directed by emergency response personnel in the event of an unplanned fire or other emergency. Any permitted vegetation clearing activities must be appropriately planned, recorded and monitored. The legally binding mechanism will also restrict the allowable land use activities for the offset area, prohibiting timber harvesting, cropping, vegetation thinning, and any alternative land use that would result in loss of the offset.
Dam maintenance	<ul style="list-style-type: none"> Landowners can maintain existing dams to ensure their walls are stable and they don't fill up with sediment. Works associated with dam maintenance will be restricted to the waterbody itself, dam wall and adjacent area. There must be no damage to native vegetation surrounding the dam as a result of dam maintenance. Dams can be accessed by livestock based on agreed grazing regimes in the OAMP

7.3 Fencing and access

Existing tracks will be used to access the Stage 1 BCOA to the greatest extent practical. Access tracks will be maintained to ensure they are safely accessible, and existing tracks will be prioritised over any new alternative track alignments. Existing and any new access tracks will be no wider than 5m.

Fencing will be installed as per the requirements of the grazing management program outlined in **Section 7.6**. Internal fencing will comprise of a four-wire fence consisting of 2 strands of barb with a plain top and bottom wire to facilitate the safe movement of fauna between the offset area and adjacent suitable habitat.

Vegetation disturbance associated with track and fence establishment will be minimised to the greatest extent possible in accordance with **Table 7.2**.

7.4 Weed management

7.4.1 Weed management approach

Weed management within the Stage 1 BCOA will follow best practice integrated weed management (IWM) for natural ecosystems which combines multiple strategies to effectively control weeds, whilst minimising the environmental impact of any single technique. This requires a long-term approach to weed management that identifies control techniques most suitable to the environmental weed, as well as the impact of the control technique on native flora and the broader ecosystem. The aim of IWM for natural ecosystems within the Stage 1 BCOA is to achieve long-term weed control, ecosystem stability and restoration, and improve the habitat quality for koala and *Cycas megacarpa*.

The weed management process for the Stage 1 BCOA follows the adaptive management approach illustrated in **Figure 7-1**. It involves the implementation of a range of activities that will:

- **Identify & monitor** weed species and extents across the offset site
- **Prevent & minimise** the introduction and spread of new weed species
- **Control & reduce** the extent of existing weed infestations across the offset site
- **Report & review** progress to achieving the objectives and outcomes

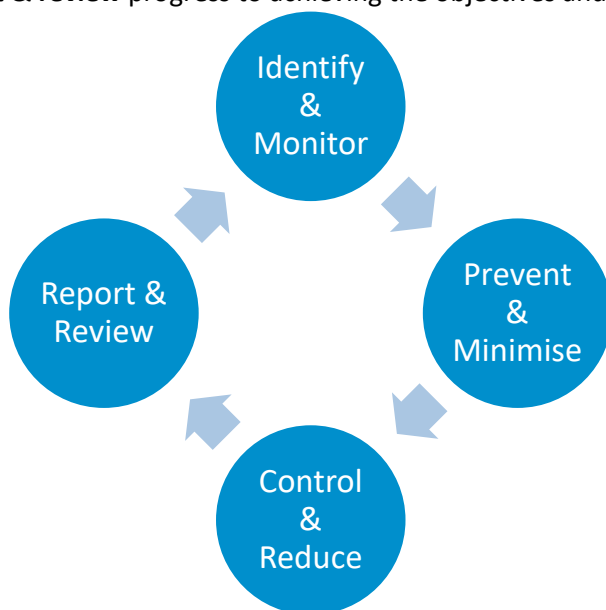


Figure 7-1 Weed management approach

7.4.2 Prevent and minimise

The following measures will be taken to prevent and minimise the introduction and/or spread of weeds within the Stage 1 BCOA:

- All persons entering the offset will be required to ensure vehicles and equipment are weed free to prevent movement of weed material into the offset area.
- All contractors entering the offset must hold a current weed hygiene certificate or equivalent for all vehicles and equipment, and this must be provided upon request.
- All persons must enter the offset through dedicated entry points/gates only.
- All vehicles/plant must be driven on dedicated access tracks within the offset.
- Any matter (e.g. soil, mulch) entering the offset must be from a reputable supplier and must be certified free of weed material (in particular, weed seeds), fire ants and phytophthora. Evidence of certification must be provided upon request.

7.4.3 Priority species for management

The priority species for management within the Stage 1 BCOA is *Lantana camara*. Baseline surveys undertaken in 2025 indicate this is the most abundant species present, is recognised as a threat to koala and *Cycas megacarpa*, is a Weed of National Significance (WONS) and is a Category 3 restricted invasive plant under the *Biosecurity Act 2014* (Qld). In addition to *Lantana camara*, several other weeds have been identified for management. These weeds are either restricted plants under the *Biosecurity Act 2014* (Qld), WONS, or have an average cover greater than 5%. These species are listed in **Table 7.3**.

Table 7.3 Priority weed species for management

Weed species	Status	Number of sites recorded	Average Cover %
<i>Lantana camara</i> (Lantana)	QLD Biosecurity Act: Cat 3 National Status: WONS	35	20.29
<i>Melinis repens</i> (Red natal grass)	QLD Biosecurity Act: N/A National Status: N/A	23	15.09
<i>Lantana montevidensis</i> (Creeping lantana)	QLD Biosecurity Act: Cat 3 National Status: N/A	22	6.86
<i>Opuntia streptacantha</i> (Prickly pear)	QLD Biosecurity Act: Cat 3 National Status: N/A	21	2.14
<i>Opuntia tomentosa</i> (Velvety tree pear)	QLD biosecurity Act: Cat 3 National status: N/A	15	1.13
<i>Opuntia stricta</i> (Common pest pear)	QLD biosecurity Act: Cat 3 National status: N/A	16	1.00
<i>Cryptostegia grandiflora</i> (Rubber vine)	QLD Biosecurity Act: Cat 3 National Status: WONS	8	3
<i>Cenchrus setaceus</i> (Crimson fountain grass)	QLD Biosecurity Act: Cat 3 National Status: N/A	2	9
<i>Chamaecrista rotundifolia</i> (Round-leaf cassia)	QLD Biosecurity Act: N/A National Status: N/A	5	8
<i>Bryophyllum delagoense</i> (mother of millions)	QLD Biosecurity Act: Cat 3 National Status: N/A	2	5.5
<i>Harrisia martinii</i> (harrisia cactus)	QLD Biosecurity Act: Cat 3 National Status: N/A	3	1

7.4.4 Priority areas for management

Results of baseline and ongoing weed surveys will be used to determine the priority areas for weed management. Weed control within AUs with a baseline total weed cover score of greater than 60% will be prioritised in the first 3 years of management. These AUs are listed in **Table 7.4**. These priority AUs include all regrowth and non-remnant AUs within the Stage 1 BCOA. The priority areas for management in years 1, 2 and 3 total 571 ha in size including 148 ha within the *Cycas megacarpa* offset area.

Priority areas will be reviewed following the Year 3 weed monitoring event as described in **Section 8.2**.

Table 7.4 Priority assessment units for weed management in years 1, 2 and 3

AU	Survey Site	GTR	VM Act Status	Condition	Total area in Stage 1 BCOA (ha)	Area in Koala Stage 1 BCOA (ha)	Area in <i>Cycas megacarpa</i> Stage 1 BCOA (ha)
1	BC1, BC2	11.3.25	Least concern	Remnant	18.1	18.1	0.00
3	BC4(C), BC5, BC6, BC11, BC31, BC32(C)	11.11.15	Least concern	Remnant	280.3	280.3	40.7
4	BC9, BC34, BC50(C)	11.11.15	Least concern	Regrowth	34.3	34.3	8.6
5	BC35(C), BC36(C)	11.11.15	Least concern	Non-remnant	40.2	40.2	37.5
8	BC14, BC43(C), BC44(C), BC45	11.11.4	Least concern	Regrowth	109.2	109.2	35.9
9	BC15, BC46 (C), BC47 (C)	11.11.4	Least concern	Non-remnant	89.0	89.0	26.0
Total					571.10	571.10	148.7

7.4.5 Control approach and techniques

Experienced weed management contractors will be engaged to undertake weed control in the Stage 1 BCOA. They must have relevant experience in weed management, experience with weed control in native bushland settings, and have an Agricultural Chemicals Distribution Control (ACDC) license.

Weed control techniques will be species dependent and may include physical, mechanical, chemical, fire or biological techniques. Weed control techniques may vary over the life of the offset and any advancements in control techniques should be adopted where appropriate. Weed control activities may require primary, follow-up and maintenance activities:

- Primary – initial site works to control ground cover weeds, woody weeds in the understorey and vines. These works typically create large site disturbance stimulating growth of new native and weed species.
- Follow-up – multiple intervals of follow-up control will be required to treat newly germinating and resprouting weeds once primary works are completed.
- Maintenance – weed density, and treatment frequency, should be decreasing at this stage.

There are a wide range of publicly available resources providing guidance on best practice management techniques for WONS and restricted invasive plants. The following resources can be consulted to determine the most appropriate control techniques:

- [Weed profiles - Weeds Australia](#)

- <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/biosecurity/plants/invasive/restricted>
- [Controlling weeds \(invasive plants\) on your property | Business Queensland](#)

Section 5.3 of the *South East Queensland Ecological Restoration Framework: Manual*⁴ (SEQERF) (Chenoweth EPLA & Bushland Restoration Services, 2012) provides guidance on weed control techniques and includes detailed guidance on herbicide use including chemical mixing rates. Appendix C of the SEQERF includes control techniques and herbicide application rates for particular weed species. These resources should be consulted prior to any herbicide application. All herbicide use must be in accordance with directions on the label and Material Safety Data Sheets (MSDS). Up-to-date product information is available on the Public Chemical Registration Information System: Public Chemical Registration Information System Search - portal.apvma.gov.au.

A summary of potential control techniques for the priority weed species is provided in **Table 7.5**. These techniques are intended as a guide only and alternative techniques may be adopted as recommendations and best practice approaches may change over time.

7.4.5.1 Specific requirements for *Lantana camara*

Lantana camara is the priority weed for management at the Stage 1 BCOA and control will be undertaken generally in accordance with the techniques and timeframes presented in the Weed Management Guide - *Lantana (Lantana camara)* (CRC, 2003). As outlined in the Guide, an integrated management approach is most effective when treating *Lantana camara*. These integrated techniques are summarised in **Table 7.5** and the species growth calendar is illustrated in **Figure 7-2**.

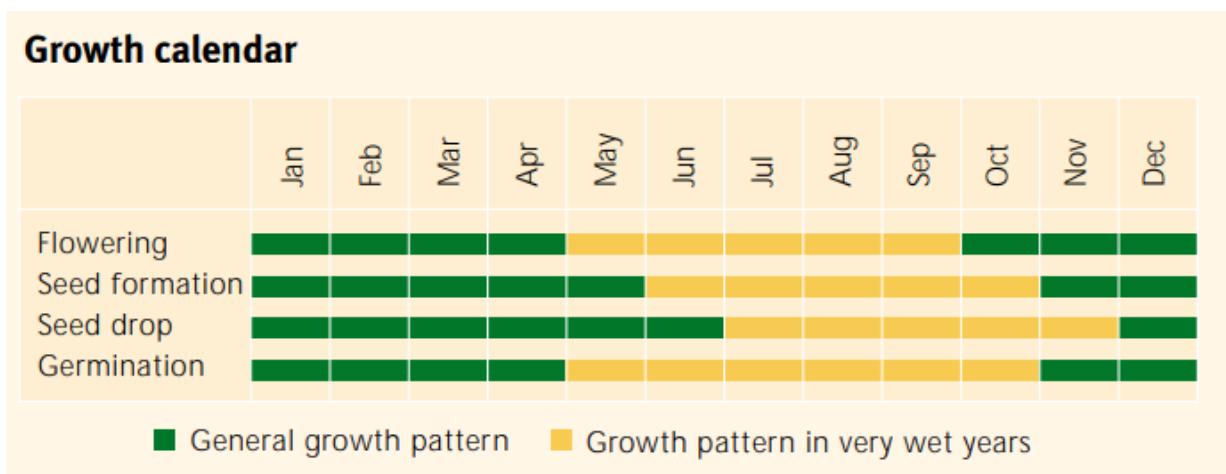


Figure 7-2 Growth calendar for *Lantana Camara*

⁴ hlw.org.au/resources/downloads/guidelines/seq-ecological-restoration-framework/212-seq-ecological-restoration-framework-manual/file

Table 7.5 Weed management control techniques for priority species

Species	Control Techniques	Timing	Management Outcomes	Threat to Biodiversity
<p><i>Lantana camara</i> (Lantana) QLD Biosecurity Act: Cat 3 National Status: WONS</p>	<p>Physical control Hand grubbing only suitable for seedlings. Wear gloves for protection from thorns.</p> <p>Mechanical control Not suitable for small infestations For medium or large infestations, bulldoze, plough, stick rake or slash infestations. Soil disturbance will lead to mass seed germination, so follow up with further controls. Do not use mechanical control in areas susceptible to erosion. A permit may be required.</p> <p>Chemical control Spot spray plants less than 2 m in height between summer and autumn with a registered herbicide. Spraying may be uneconomical for medium or large infestations. Helicopter or drone spraying may be used in these instances.</p> <p>Fire control Not suitable for small infestations For medium or large infestations, under permit, burn in summer with good fuel load of grass and/or mechanically cleared lantana. Also use as follow up. Do not burn in rainforests.</p> <p>Biological control There are four useful biological control agents. They are already distributed throughout their potential range. Redistribution is not recommended.</p>	<p>Refer to the Weed Management Guide, Lantana – <i>Lantana camara</i> (CRC for Australian Weed Management 2003)</p>	<p>No new weed infestations. Reduction in average weed cover to <5%.</p>	<p>Lantana forms dense thickets that smother and kill native vegetation and are impenetrable to animals, people and vehicles. Research indicates more than 1,400 native species are negatively affected by lantana invasion, including many endangered and threatened species. As lantana is a woody shrub that has thin, combustible canes, its presence can also create hotter bushfires, altering native vegetation communities and pastures.</p>
<p><i>Melinis repens</i> (Red natal grass) QLD Biosecurity Act: N/A National Status: N/A</p>	<p>Manual control Small infestations can be chipped out with hand tools and bagged and disposed of.</p> <p>Chemical control Boom spray or foliar spray with glyphosate and Fluazifop are recommended for larger infestations. Spot spraying for smaller infestations. Refer label carefully before use. Add a wetting agent (surfactant) to help the herbicide penetrate and spread. Refer label carefully before use.</p>	<p>Chemical spraying should be undertaken before flowering / seeding. Generally, peak flowering time is during warmer months (Sept – June).</p>	<p>No new weed infestations.</p>	<p>Red natal covers a dense groundcover layer and outcompetes natives.</p>
<p>Creeping lantana <i>Lantana montavidensis</i> QLD Biosecurity Act: Cat 3</p>	<p>Manual control For large Lantana infestations, treatment with herbicides by foliar spraying is usually not economically feasible. However, fire and slashing/cutting, can reduce dense infestations, making follow-up spot treatments with chemicals more economically viable.</p>	<p>Manual removal any time of year. March–May for herbicide control.</p>	<p>No new weed infestations.</p>	<p>Drought tolerance enables lantana to persist in dry seasons, competing and often replacing native ground cover. It forms dense thickets that smother and kill native vegetation and are impenetrable to animals, people and vehicles.</p>

Species	Control Techniques	Timing	Management Outcomes	Threat to Biodiversity
National Status: N/A	Lantana seed banks remain viable for at least four years, so follow-up control to kill seedlings before they mature is vital to ensure initial management efforts to control the parent bush are not wasted. Herbicide control When treating actively growing plants less than 2-m tall, spray foliage overall to the point of run-off. Splatter gun techniques are effective and particularly useful in hard-to-access areas. This is best done in autumn, when sap-flows draw the poison down into the root stock, but before night temperatures get too cold.			
<i>Opuntia streptacantha</i> (Prickly pear) QLD Biosecurity Act: Cat 3 National Status: N/A	Chemical control Spot spray with registered herbicide. Biological control Includes eight insects and a mite in Queensland. These species are: <ul style="list-style-type: none"> • Stem-boring moths: <i>Cactoblastis cactorum</i>. • Cochineal scale insects: <i>Dactylopius ceylonicus</i>, <i>D. opuntiae</i>, <i>D. confuses</i> and <i>D. austrinus</i>. • Cell-sucking bugs: <i>Chelinidea tabulate</i>. • Stem-boring moths: <i>Tucumania tapiacola</i>. • Stem-boring beetles: <i>Archlagocheirus funestus</i>. • Prickly pear red spider mites: <i>Tetranychus opuntiae</i>. <i>Cactoblastis spp.</i> and <i>Dactylopius spp.</i> provide the most success.	September to April. At least one control event per year, if required.	This species will only be actively managed in specific areas identified in the baseline weed survey (i.e. where biological control agents are not active). No new weed infestations.	Dense infestations compete with native vegetation, limiting the growth of small shrubs and groundcover species. The plant's sharp spines or barbs can cause injury to stock and native animals.
<i>Opuntia tomentosa</i> (Velvety tree pear) QLD biosecurity Act: Cat 3 National status: N/A	Physical control Dig out plants completely and deep bury. Ensure that all tubers that can grow are removed and destroyed. Ploughing is not considered an effective means of control unless followed by annual cropping. Manual control Mechanical control using machinery can clear large areas, though this will likely need to be followed up later with other control methods due to stem segments re-establishing. Biological control Biological control includes two introduced insects: <ul style="list-style-type: none"> • Cochineal bug (<i>Dactylopius opuntiae</i>) • Cactoblastis moth (<i>Cactoblastis cactorum</i>) These insects have been proven to reduce fruiting of velvety tree pear and the abundance of seedlings in plants under 1 m high. Cactoblastis larvae and cochineal bug can kill young tree pear but have little impact on large plants. Older tree pear pads and stems contain tough, fibrous material that the insects cannot penetrate.	September to April. At least one control event per year, if required.	This species will only be actively managed in specific areas identified in the baseline weed survey (i.e. where biological control agents are not active). No new weed infestations.	Infestations compete with native vegetation, limiting the growth of small shrubs and groundcover species. The plant's sharp spines or barbs can cause injury to stock and native animals.

Species	Control Techniques	Timing	Management Outcomes	Threat to Biodiversity
	<p>The insects multiply in number when they are protected from the elements, forming a nursery that can spread to regrowth from cut stumps or pads in contact with the ground. Once established, adults reproduce creating new larvae which attack pear.</p> <p>Chemical control</p> <p>Foliar spray, stem injection and cut stump with Triclopyr, Picloram, Aminopyralid. Refer label carefully before use.</p>			
<p><i>Opuntia stricta</i> (Common pest pear) QLD biosecurity Act: Cat 3 National status: N/A</p>	<p>Physical control</p> <p>Dig out plants completely and deep bury. Ploughing is not considered an effective means of control unless followed by annual cropping.</p> <p>Mechanical control</p> <p>Mechanical control using machinery can clear large areas, though this will likely need to be followed up later with other control methods due to stem segments re-establishing.</p> <p>Biological control</p> <p>Biological control includes two introduced insects:</p> <ul style="list-style-type: none"> • Cochineal bug (<i>Dactylopius opuntiae</i>) • Cactoblastis moth (<i>Cactoblastis cactorum</i>) <p>These insects have been proven in reducing the fruiting and abundance of common pest pear. The insects multiply in number when they are protected from the elements, forming a nursery that can spread to regrowth from cut stumps or pads in contact with the ground. Once established, adults reproduce creating new larvae which attack pear.</p> <p>Chemical control</p> <p>Foliar spray, stem injection and cut stump with Triclopyr, Picloram, Aminopyralid. Interchangeable with glyphosate and Metsulfuron methyl. Refer label carefully before use.</p>	<p>September–March (Herbicide). September–December (Biological).</p>	<p>This species will only be actively managed in specific areas identified in the baseline weed survey (i.e. where biological control agents are not active). No new weed infestations.</p>	<p>Infestations compete with native vegetation, limiting the growth of small shrubs and groundcover species. The plant's sharp spines or barbs can cause injury to stock and native animals.</p>
<p><i>Cryptostegia grandiflora</i> (Rubber vine) QLD Biosecurity Act: Cat 3 National Status: WONS</p>	<p>Fire control</p> <p>Fire can be used as a tool to control rubber vine. Two successive annual burns are recommended. The first fire will open up the infestation to increase grass growth (fuel load) while killing rubber vine plants. The second fire will clean up the regrowth that occurs after the first fire.</p> <p>Mechanical control</p> <ul style="list-style-type: none"> • Repeated slashing close to ground level • stick-raking or blade-ploughing + sowing seeds and burning to kill seedlings <p>Biological control</p> <p>Rubber vine rust (<i>Maravalia cryptostegiae</i>) causes defoliation, reduces seed production, can kill seedlings and causes dieback.</p>	<p>Biological control over wet season for Rubber vine rust and dry season for moth.</p>	<p>No new weed infestations.</p>	<p>Rubber vine forms dense thickets smothering and killing native shrubs and trees.</p>

Species	Control Techniques	Timing	Management Outcomes	Threat to Biodiversity
	<p>The moth <i>Euclasta whalleyi</i> has larvae that feed on leaves which reduces smothering effect on other vegetation increases leaf litter and promotes increased grass growth amongst rubber vine, increasing fuel loads required for fire management. Decreased flower and pod production should reduce the ability of rubber vine to spread.</p> <p>Chemical control</p> <p>Spraying techniques include:</p> <ul style="list-style-type: none"> • Aerial application • Foliar spray • Basal bark spray • Soil-applied herbicide • Cut stump treatment <p>Refer to label and QLD Factsheet before use.</p>			
<p><i>Cenchrus setaceum</i> (Crimson fountain grass) QLD Biosecurity Act: Cat 3 National Status: N/A</p>	<p>Manual control</p> <p>Seedling and small plants can be hand-pulled, chipped out, bagged, composted or disposed of.</p> <p>Chemical control</p> <ul style="list-style-type: none"> • boom spray • Foliar spray • spot spray • seed set suppression <p>Refer to label and QLD Factsheet before use.</p> <p>Mechanical control</p> <p>Slashing and mowing can reduce the number of seeds produced when timed before or during flowering.</p>	Spring-Summer.	No new weed infestations.	Densely tufted perennial grass which smothers and outcompetes native groundcovers and saplings for trees and shrubs.
<p><i>Chamaecrista rotundifolia</i> (Round-leaf cassia) QLD Biosecurity Act: N/A National Status: N/A</p>	<p>Fire control</p> <p>Burns will most individuals and encourage grass growth. Often heavy seed reserve in the soil so additional burns may be required.</p> <p>Chemical control</p> <p>Round-leaf cassia is particularly tolerant of herbicides. Selective broadleaf herbicides such as Brushoff. Chemicals are applied via foliar spray, boom spray and spot spray techniques.</p>	Wet season and before seeding.	No new weed infestations.	Large infestations outcompete native plants and can modify habitats for native fauna.
<p><i>Bryophyllum delagoense</i> (Mother-of-millions (MoM))QLD Biosecurity Act: Cat 3</p>	<p>MoM flowers in winter and produces seed by tiny plantlets on its leaves. Broken-off leaves can also grow new plants.</p> <p>Fire control</p> <p>Burning MoM kills and reduces infestations and encourages grass competition. Follow up with burning with greater grass density will be more successful.</p> <p>Biological control</p>	Control before winter flowering.	No new weed infestations.	Large infestations outcompete native plants and can modify habitats for native fauna.

Species	Control Techniques	Timing	Management Outcomes	Threat to Biodiversity
National Status: N/A	<p>South African citrius is a known biological control but also targets Australian crops so cannot be legally distributed.</p> <p>Chemical control</p> <ul style="list-style-type: none"> • Spray gun • Foliar spray <p>Refer to label and QLD Factsheet before use.</p>			
<p><i>Harrisia martini</i> (Harrisia Cactus) QLD Biosecurity Act: Cat 3 National Status: N/A</p>	<p>Control of this plant is difficult as it has a deep underground tuberous root system and use of a combination of physical, biological and herbicide controls is recommended.</p> <p>Manual control</p> <p>Dig out plants completely and burn. Ensure all tubers are removed and destroyed. Spot spray with registered herbicide.</p> <p>Biological control</p> <p>Biological control includes two introduced insects:</p> <ul style="list-style-type: none"> • a stem-boring longicorn beetle (<i>Alcidion cereicola</i>) • a mealybug (<i>Hypogeococcus festerianus</i>). <p>Stem-boring beetle only attacks older woody stems. In Collinsville area, large beetle colonies developed and contributed to collapse of dense areas of cactus. Populations of <i>Alcidion cereicola</i> have declined with reduction in cactus in recent years. More successful biological control agent is mealybug <i>Hypogeococcus festerianus</i>, which is now present in most areas infested with harrisia cactus. Mealybug is considered more effective in more northern areas of central Queensland.</p> <p>Herbicide control</p> <p>Triclopyr as tea 200 g/L + Picloram as tipa 100 g/L (e.g. Slasher) or Triclopyr as tea 200 g/L + Picloram as tipa 100 g/L + Aminopyralid 25 g/L (e.g. Tordon RegrowthMaster) (e.g. Tordon DSH®).</p>	<p>September–March (Herbicide). September–December (Biological).</p>	<p>This species will only be actively managed in specific areas identified in the baseline weed survey (i.e. where biological control agents are not active). No new weed infestations.</p>	<p>Highly invasive species. Produces large quantities of seed that is highly viable and easily spread by birds and other animals. Any broken-off portions of the plant will take root and grow.</p>

7.5 Pest animal management

Three pest fauna species were observed within the Stage 1 BCOA during baseline surveys, including wild dogs (*Canis lupus dingo*), feral cat (*Felis catus*) and European hare (*Lepus europaeus*). Feral pigs (*Sus scrofa*) are also known to be present within the adjacent Project area, and therefore likely to be present in the offset area.

Wild dogs and feral pigs are identified as potential threats to koala and *Cycas megacarpa*, respectively and will be the focus of the pest animal management within the BCOA. Management strategies for these species are outlined below.

Currently, feral cats are not included as part of the BCOA pest animal management as they are not a listed threat to koala (DAWE 2022). If koala injury or mortality is observed and is likely due to feral cat predation, pest animal management and monitoring within the offset will be reviewed and appropriate corrective actions developed.

7.5.1 Wild dogs

7.5.1.1 Wild dog control triggers

Triggers for commencing wild dog controls are:

- wild dogs are identified from motion-detection camera traps as per monitoring requirements in **Section 8.4**
- increase occurrence of wild dogs (compared to baseline survey results, see **Section 3.4**) within the offset area (systematically, or anecdotally)
- detection of dead koala (dog predation).

If any of these triggers are met, wild dog controls are to commence via the methods below.

7.5.1.2 Wild dog control methods

Dingoes are considered native wildlife in national parks, and protected in these areas, under the Nature Conservation (Protected Areas Management) Regulation 2017, Nature Conservation (Wildlife Management) Regulation 2006, and the *Recreation Areas Management Act 2006*. These protections to dingoes are not be extended to the private land encompassing the Stage 1 BCOA, unless the area is declared a 'nature refuge', 'special wildlife reserve' (Behrendorff, 2021; DAF, 2020), or legally secured as an Environmental Offset Protection Area under the *Environmental Offsets Act 2014*. As koala conservation is one of the main values for conservation within the Stage 1 BCOA, necessitating the offsets, dingoes will be considered wild dogs in the Stage 1 BCOA, and therefore be considered an invasive animal under the *Biosecurity Act 2014*.

Control of wild dogs will adopt the most humane, target species, cost effective, and efficacious methods available, and be undertaken in accordance with the *National Code of Practice for the humane control of wild dogs* (Sharp & Saunders, National Code of Practice for the humane control of wild dogs, 2012). Ground shooting and ejector devices with PAPP baiting are currently recommended as the most human methods of wild dog control (Allen, 2019). However, due to the risk that PAPP baiting poses on domestic and working dogs, this method is not proposed within the Stage 1 BCOA. The preferred controlled methods are ground shooting and trapping.

Ground shooting

Ground shooting must be undertaken in accordance with:

- National Code of Practice for the humane control of wild dogs (Sharp & Saunders, 2012)

- NATSOP-DOG003 National Standard Operating Procedure: Ground shooting of wild dogs (Sharp, 2016)

General guidelines for shooting are as follows:

- Shooting of wild dogs will only be performed by skilled operators who have the necessary experience with firearms and who hold the appropriate licences and accreditation (Sharp, 2016).
- When shooting an animal, it must be clearly visible and able to be killed with a single shot (Sharp, 2016).
- Only head (brain) or chest (heart-lung) shots must be used. Shots to the head are preferred over chest shots as they are more likely to cause instantaneous loss of consciousness (Sharp, 2016).
- The shooter must be certain that each animal is dead before another is targeted (Sharp, 2016).
- Wounded dogs must be located and dispatched as quickly and humanely as possible with a second shot preferably directed to the head (Sharp, 2016).

Trapping

Trapping must be undertaken in accordance with:

- National Code of Practice for the humane control of wild dogs (Sharp & Saunders, 2012)

General guidelines for trapping include, but are not limited to, the following:

- All traps have the potential to cause injury and should only be used when no practical alternative exists (Sharp & Saunders, 2012).
- Cage or box traps cause fewer injuries than traps that restrain animals (Sharp & Saunders, 2012).
- Leg-hold traps, including toothed steel-jaw traps must not be used (Sharp & Saunders, 2012).
- Traps should be placed in a suitable area protected from extreme weather (Sharp & Saunders, 2012).
- Traps must be inspected at least once daily or as authorised by the relevant authority (Sharp & Saunders, 2012).
- Wild dogs must be destroyed as quickly and humanely as possible with a single rifle shot to the brain (Sharp & Saunders, 2012).
- Severely injured non-target animals must be destroyed quickly and humanely (Sharp & Saunders, 2012).

7.5.2 Feral pigs

7.5.2.1 Feral pig control triggers

Triggers for increasing feral pig controls are:

- observed increase in incidental sightings of feral pigs
- increase in 10% of feral pig baseline activity indices
- evidence of pest animal degradation of MNES species habitats, or predation on cycad seeds.

If any of these triggers are identified, feral pig controls are to:

- increase frequency of feral pig control events
- review and alter pest control methods
- adopt pest control across a broader area if it is likely pest animals are breeding in adjacent areas.

7.5.2.2 Feral pig control methods

Control of feral pigs will aim to reduce negative impacts on feral pig suffering, using the most humane, target species, cost effective, and efficacious methods available, and be undertaken in accordance *with National Code of Practice for the humane control of feral pigs* (TVWG, 2024a). Given the risk that Hog Bait Boxes baited with HOGGONE® pose on domestic and working dogs, this method is not proposed within the Stage 1 BCOA. Alternatively, ground shooting will be used as the primary control method, with trapping as the secondary method.

Ground shooting

Ground shooting will be undertaken in accordance with:

- National Code of Practice for the humane control of feral pigs (TVWG, 2024a)
- NATSOP-PIG003 National Standard Operating Procedure: Ground shooting of feral pigs (TVWG, 2024b)

The operating procedure NATSOP-PIG003 is to be referred to, in collaboration with skilled operators, and guide ground shooting. General guidelines for shooting for are as follows:

- Ground shooting should not be conducted prior to, or during any other control program e.g. trapping or poisoning, as it can disrupt normal feral pig activity and may cause temporary dispersal of pigs to other areas (TVWG, 2024b).
- Shooting of feral pigs should only be performed by skilled operators who have the necessary experience with firearms and who hold the appropriate licences and accreditation (TVWG, 2024b).
- Only head (brain) or chest (heart-lung) shots must be used. Shots to the head are preferred over chest shots as they are more likely to cause instantaneous loss of consciousness (TVWG, 2024b).
- The shooter must be certain that each animal is dead before another is targeted (TVWG, 2024b).
- Wounded pigs must be located and dispatched as quickly and humanely as possible with a second shot preferably directed to the head (TVWG, 2024b).

Ground shooting is not suitable in inaccessible or rough terrain where sighting of target animals and accurate shooting is difficult or when wounded animals cannot easily be followed up and killed (TVWG, 2024b).

Trapping

Trapping must be undertaken in accordance with:

- National Code of Practice for the humane control of feral pigs (TVWG, 2024a)
- NATSOP-PIG001 National Standard Operating Procedure: Trapping of Feral Pigs (Sharp, 2012)

General guidelines for trapping include, but are not limited to, the following:

- All traps must be inspected daily (Sharp, 2012).
- Captured animals must be approached carefully and quietly to reduce panic, further stress and risk of injury (Sharp, 2012).
- Trapped pigs must be destroyed by shooting, inside the trap, as quickly and humanely as possible (Sharp, 2012).
- Severely injured non-target animals must be destroyed quickly and humanely (Sharp, 2012).

7.6 Grazing management

Grazing within the offset area will be used as a tool to manage biomass and reduce fuel loads. Current levels of grazing within the offset area are low, with one head of cattle per 4 ha. Stocking rates will be kept low and will not exceed one head of cattle per 4 ha for the life of the approval. Grazing will be managed via the following zoning (see **Figure 7-3**):

- Zone 1 – grazing completely removed from *Cycas megacarpa* recipient sites for seven years until completion criteria can be met under the CMTMP. After seven years, grazing will be removed during the summer months (i.e. wet season).
- Zone 2 – Grazing will be removed during the summer months (i.e. wet season).
- Zone 3 – Grazing will be removed during the summer months (i.e. wet season).

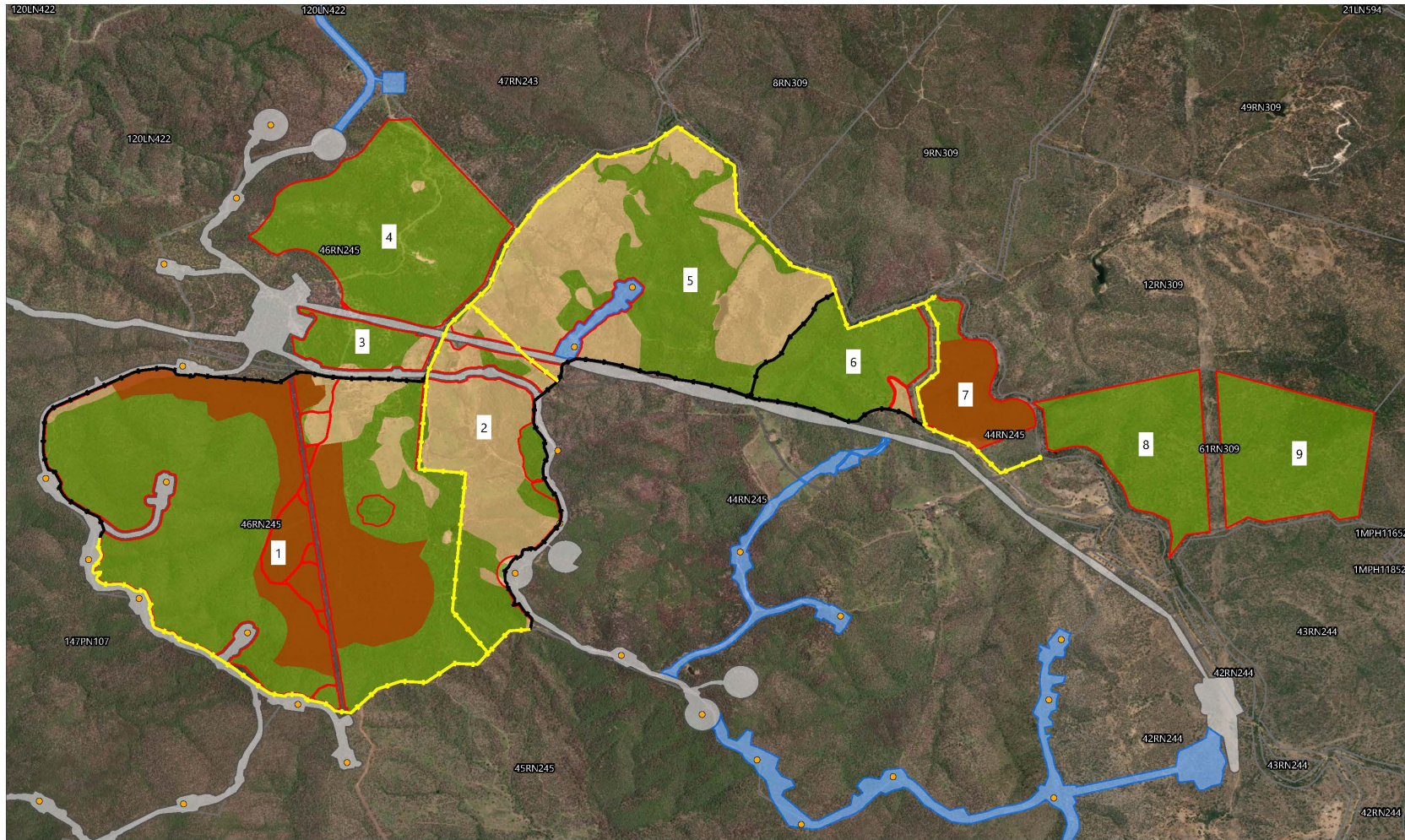
To manage livestock across the zones requires augmentation of existing paddock fencing with new fencing, as shown in **Figure 7-3**. Landholder 1 will be destocked until such time that new fencing can be established within the Project area. Landholder 2 will require destocking of a significantly larger paddock that include areas of both Zone 1 and Zone 2 as new clearing would be required to establish fencing along the interface to move cattle in and out of Zone 2 while precluding cattle from Zone 1. No fencing is required for Landholder 3.

Table 7.6 presents the grazing management strategy for the Stage 1 BCOA. Where there is a mix of zones within the one paddock, the highest restrictions will apply, e.g. Paddock 1 has Zones 1, 2 and 3 and therefore grazing management for Zone 1 would apply to that paddock. Monitoring to support the grazing management strategy is presented in **Section 8.2.2**.

Table 7.6 Grazing strategy for biomass control

Grazing Management Zone	Management Strategy	Trigger for Control
Zone 1 - Cycad recipient sites	<p><i>Complete exclusion of cattle within these areas for the first seven years.</i></p> <p>After the first seven years following translocation, grazing will be managed in accordance with Zone 2 as per this table. The approach taken is one of an outcome-based approach, whereby the focus will be on ensuring cattle are not negatively impacting on the health and viability of the translocated individuals as well as ensuring biomass is low enough that is not increasing the bushfire risk.</p>	<p>After the first seven years:</p> <ul style="list-style-type: none"> • Exclude all grazing during the wet season. • Should ground cover exceed 50%, cattle can be reintroduced to the paddock to assist in managing biomass. • If average groundcover drops below 40%, cattle will be removed from the corresponding paddock to allow for natural regeneration of the groundcover. • If grazing intensity is not consistent with achieving the conservation gain as determined through habitat quality assessments, the above groundcover thresholds must be adjusted as per advice from a suitably qualified ecologist.
Zone 2 - Natural regeneration areas (regrowth and non-remnant areas)	<p><i>Grazing excluded during the wet season and permitted in the dry season to reduce biomass</i></p>	<p>Exclude all grazing during the wet season. Should ground cover exceed 50%, cattle can be reintroduced to the paddock in dry season to assist in managing biomass. If average groundcover drops below 40%, cattle will be removed from the corresponding paddock to allow for natural regeneration of the groundcover.</p>

Grazing Management Zone	Management Strategy	Trigger for Control
		<p>If grazing intensity is not consistent with achieving the conservation gain as determined through habitat quality assessments, the above groundcover thresholds must be adjusted as per advice from a suitably qualified ecologist. .</p>
<p>Zone 3 - Remnant woodland</p>	<p><i>Grazing excluded during the wet season and permitted in the dry season to reduce biomass</i></p>	<p>Exclude all grazing during the wet season. Should ground cover exceed 50%, cattle can be reintroduced to the paddock to assist in managing biomass.</p> <p>If average groundcover drops below 40%, cattle will be removed from the corresponding paddock to allow for natural regeneration of the groundcover.</p> <p>If grazing intensity is not consistent with achieving the conservation gain as determined through habitat quality assessments, the above groundcover thresholds must be adjusted as per advice from a suitably qualified ecologist.</p>



Boulder Creek
Wind Farm

DWG No: AUL-004-010[B]
DATE: 11/11/2025
DRAWN: DC
REVIEWED KM
SCALE (A4): 1:25,000



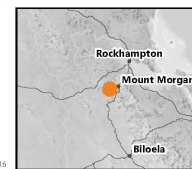
Grazing management areas and fencing
Figure 7-3

- Wind Turbine Generator
- Offset area boundary

- Proposed Disturbance Footprint Stage 1
- Proposed Disturbance Footprint Stage 2
- Cadastral Boundary

- Grazing management zones Cycad recipient area (zone 1)
- Grazing management zones Natural regeneration area (zone 2)
- Grazing management zones Remnant area (zone 3)

- Proposed Fence
- Existing Fence
- Number Label = paddock number*



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Figure 7-3 Grazing management areas and fencing

7.7 Fire management

A strategic fire management strategy will be implemented for the Stage 1 BCOA to reduce the risk of catastrophic uncontrolled fires, control weeds such as *Lantana camara*, and improve habitat quality for koala and *Cycas megacarpa*. The strategic fire management strategy is informed by the results of the fire risk assessment undertaken in 2025 (Fireland Consultancy, 2025).

The strategic fire management strategy involves a range of management activities including stakeholder engagement and communication, establishing and maintaining fire breaks and fire management lines, undertaking prescribed burns, weed control (see **Section 7.4**), grazing management (see **Section 7.6**), and other fuel load reduction techniques as required. Note that monitoring to support the fire management strategy includes general inspections and biomass/fuel load monitoring and is described separately in **Sections 8.1** and **8.2**.

7.7.1 Fire danger season

The fire danger season at the Stage 1 BCOA starts in August, peaks in September and will begin to fall when consistent summer rainfall occurs. Typically, the worst fire weather conditions will be experienced during the fire danger season when the wind direction is from the north or west (LEC, 2024).

7.7.2 Relationship with the BCWF Bushfire Management Plan

The Boulder Creek Windfarm Bushfire Management Plan (LEC, 2024) has been prepared to document the bushfire hazard assessment for above ground infrastructure within the Project area and identifies strategies that will mitigate the potential risk of bushfire hazards for the construction and operation phases of the Project.

As outlined in the BCWF Bushfire Management Plan, pursuant to the *Queensland Fire Services Act 1990* (FS Act), BCWF and the construction or operation contractor are the ‘occupiers’ of the Project disturbance footprint within the Project area, i.e. the area that is within the scope of the Project’s development permit. They are responsible for bushfire management within the Project disturbance footprint.

Pursuant to the FS Act, landowners hosting the Project are the ‘owners’ of the balance of the Project area, i.e. the part of the Project area that is outside of the Project disturbance footprint, and are responsible for managing bushfire hazards within the balance of the Project area in general accordance with the guidance provided by the QFD at <https://www.fire.qld.gov.au/prepare/bushfire/prepare-for-bushfire-season>.

Bushfire management within the Stage 1 BCOA focuses on achieving conservation objectives and must be managed in accordance with this Stage 1 OAMP by BCWF.

Notwithstanding the above delineations of responsibility, bushfire management is a landscape issue and there are benefits for both BCWF and the landowners by working collaboratively to manage bushfire hazards within the Project area and Stage 1 BCOA.

7.7.3 Stakeholder engagement and communication

Implementation of the fire management strategy will involve engagement and communication with all key stakeholders. The key stakeholders for fire management are:

- Offset area landholders and neighbours
- BCWF including its employees and contractors

- Competent fire practitioner or suitably qualified person (for prescribed burns)
- Local rural fire brigade
- Offset area contractors and managers.

All BCWF employees and contractors must be aware of the Stage 1 BCOA and the Stage 1 OAMP and receive education on general fire awareness and response procedures. Key contact details for each stakeholder must be maintained by BCWF.

7.7.4 Fire breaks and fire management lines

Fire breaks and fire management lines will be established within the Stage 1 BCOA, utilising existing tracks/breaks to the greatest extent practicable.

Firebreaks are defined as areas that are cleared and maintained in a low fuel state to stop or steady a wildfire, or to back-burn against. Firebreaks can be up to 1.5 times the height of the tallest vegetation or 20 m (whichever is wider).

Fire management lines are pathways, roads, fence line clearings or tracks (including existing property tracks) used to access water for firefighting or divide the property for fuel reduction burning or back-burning. Clearing for a fire management line can be to a maximum width of 10 m.

Indicative locations for fire breaks and fire management lines are illustrated in **Figure 7-4**.

7.7.5 Prescribed burns

The Stage 1 BCOA is located within a fire prone landscape where planned (prescribed) and unplanned fires are a common occurrence (Fireland Consultancy, 2025). The landscape is characterised by low undulating foothills of low peaks and ridgelines, intersected with watercourses, associated tributaries, drainage lines and dams. Most vegetation communities within the Stage 1 BCOA are fire dependent and will require prescribed burns at some point over the life of the offset to manage excess fuel loads, reduce the risk of an unplanned fire event and promote regeneration and germination of native vegetation.

Prescribed burns within the Stage 1 BCOA will involve mosaic burning or patch burning at appropriate intervals and times over the life of the offset. Prescribed burning regimes will be determined by a competent fire practitioner, or a suitably qualified person with relevant knowledge and experience, with experience in the region and with implementing prescribed burns for hazard reduction and ecological purposes. The competent fire practitioner, or suitably qualified person, will hold the national competency of PUA FIR506 - Conduct complex prescribed burns or equivalent certification or experience. Prescribed burning regimes must consider:

- surrounding land uses
- fire history and intensity
- fire risk and fuel loads
- minimum fire frequencies for the landscape
- appropriate fire prescriptions for vegetation types (e.g. time of year to burn, frequency, targets for fuel reduction).

The Queensland Herbarium has developed the Regional Ecosystem Fire Guidelines⁵ (Queensland Herbarium, 2024) which are designed to provide guidance on the use of fire to maintain or enhance biodiversity. In developing the prescribed burn regime, the competent fire practitioner, or a suitably qualified person with relevant knowledge and experience, must consult these guidelines in conjunction with the other considerations outlined above. The Regional Ecosystem Fire Guidelines are reviewed and updated as new data becomes available and therefore the latest version should always be consulted, as recommendations may change from time to time. These guidelines can be found on the Queensland Government website.

Prior to undertaking a prescribed burn, the competent fire practitioner, or a suitably qualified person with relevant knowledge and experience, will prepare a Prescribed Burn Plan and obtain all necessary fire permits from the Queensland Fire Department, Fire Warden. Prescribed burns will be implemented by the competent fire practitioner in accordance with the Prescribed Burn Plan and associated fire permit.

7.7.6 Other fuel load reduction techniques

Fuel loads within the Stage 1 BCOA may also be managed through manual removal such as slashing, weed control (see **Section 7.4**) and grazing management (see **Section 7.6**).

⁵ <https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/fire-management>



Boulder Creek
Wind Farm

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Fire access tracks and interim firelines
Figure 7-4

- Wind Turbine Generator
- Offset area boundary
- Project Road
- Access point
- Existing Road
- Historic Alignment
- Open/Existing Alignment
- Vegetation management regional ecosystem - all**
- Remnant
- Regrowth
- Non-remnant
- Major Watercourse
- Minor Water Course

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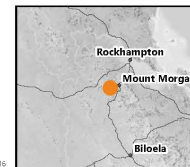


Figure 7-4 Indicative fire breaks and fire management lines

8. Monitoring Program

The monitoring program for the Stage 1 BCOA includes a range of activities to assist with the implementation of the management program, assess progress towards the offset area outcomes, identify risks and threats and guide corrective actions and adaptive management. Monitoring activities are summarised in **Table 8.1**.

Table 8.1 Summary of monitoring program activities

Monitoring Activity	Monitoring Requirement
Annual inspections	Section 8.1
Fire management monitoring	Section 8.2
Weed surveys	Section 8.3
Pest animal surveys	Section 8.4
Habitat quality assessments	Section 8.5
<i>Cycas megacarpa</i> targeted surveys	Section 8.6
Koala targeted surveys	Section 8.7

8.1 Annual inspections

Annual inspections of the Stage 1 BCOA will be undertaken until the completion criteria are achieved. Annual inspections are required to address a range of monitoring requirements related to general maintenance, fire risk, grazing management, unauthorised access and spot checks of management actions. The annual inspection requirements and indicative timing are described in **Table 8.2**.

Table 8.2 Annual inspection requirements

Inspection Requirement	Description	Timing
Survey firebreaks, fences and access tracks	Determine if maintenance or management actions are required	Prior to the start of the fire danger season allowing sufficient time to implement any fire mitigation measures if required
Stock assessment	Evaluate and document stock numbers and timing of grazing	At the commencement of a grazing event
Grazing impacts	Assess recently grazed areas for signs of degradation to environmental values	At least once a year following grazing event
Management spot checks	Implement spot checks of any management actions undertaken in the preceding 12-month period	At any time
Unauthorised access	Monitor the <i>Cycas megacarpa</i> recipient site for the unauthorised removal of cycads.	At any time
Incidental sightings	Record incidental sightings of pest animals, threatened species such as koala and significant/new outbreaks of weed species	At any time

8.2 Fire management monitoring

To support fire and grazing management practices (outlined in **Section 7.6** and **7.7**), fire management monitoring involves both biomass and fuel load monitoring as outlined below.

8.2.1 Survey sites

Biomass and fuel load monitoring will be undertaken within representative locations of the Stage 1 BCOA. Survey sites are not required to be permanent or fixed and may vary from year to year depending on previous grazing and fire management activities. The location and number of survey sites will be determined prior to each event by a suitably qualified person with relevant knowledge and experience.

8.2.2 Biomass monitoring method

Biomass monitoring will involve an estimate of percentage groundcover within approximately 1 x 1 m quadrats using the guides presented in **Figure 8-1** to determine the percentage cover at each survey site. The resulting groundcover percentage will be compared to the thresholds in the grazing management strategy (**Table 7.6**) to inform grazing for fire management purposes. Photos of each quadrat assessment must be taken and recorded for annual reporting.

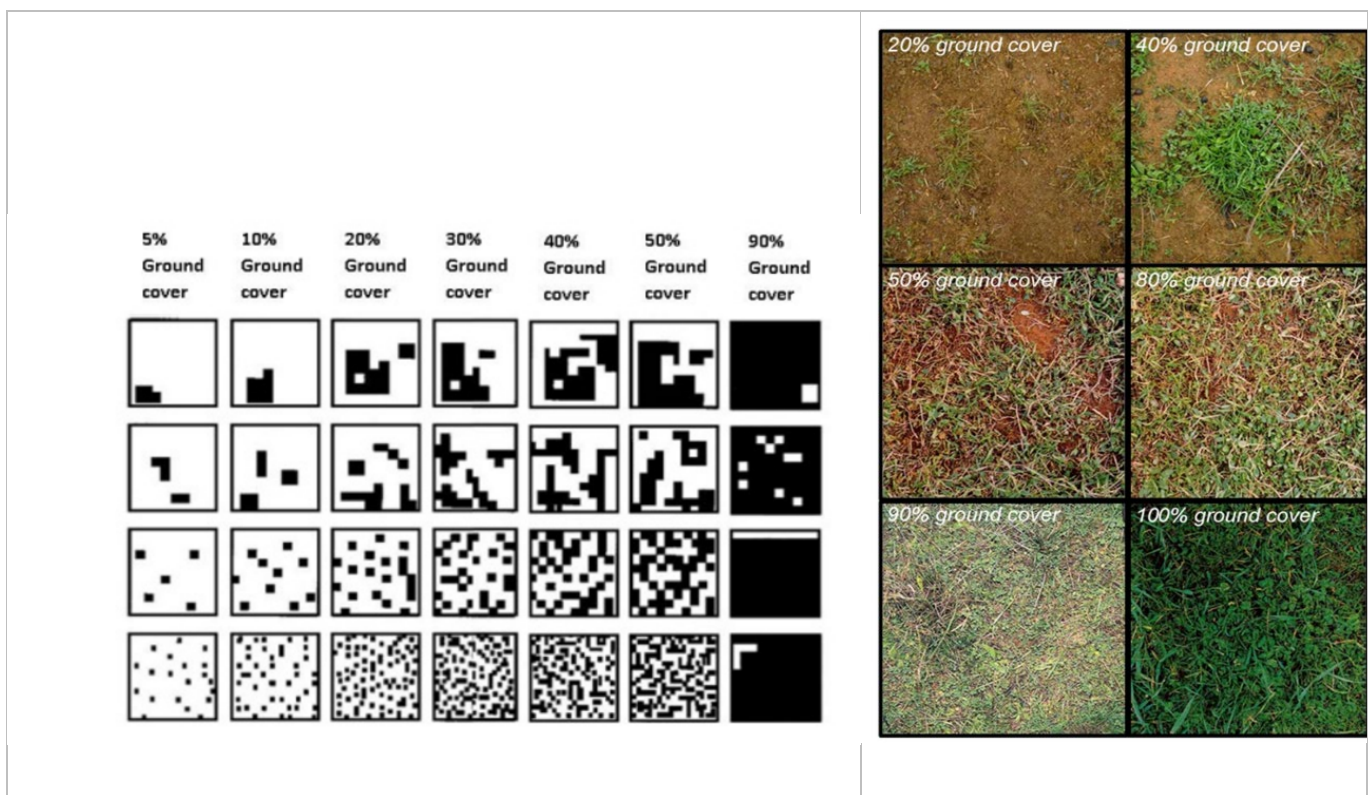


Figure 8-1 Distribution of ground cover to assist in determining percentage biomass and weed cover

8.2.3 Fuel load monitoring method

Fuel load monitoring will be undertaken in accordance with the Overall Fuel Hazard Assessment Guide⁶ (Hines, Tolhurst, Wilson, & McCarthy, 2010). Monitoring will provide an assessment of the key structural layers of the fine fuels that burn in bushfires, including bark, elevated fuels, near-surface fuels and surface fuels. The monitoring method provides for a rapid assessment of each fuel layer, which in turn is given a hazard rating and subsequently combined to provide an overall fuel hazard rating of low, moderate, high, very high or extreme.

⁶ https://www.ffm.vic.gov.au/_data/assets/pdf_file/0005/21110/Report-82-overall-fuel-assess-guide-4th-ed.pdf

The fuel hazard rating will be monitored to compare any changes from previous assessments. The fuel load assessment results will be used to support implementation of the fire management strategy in conjunction with the results of biomass monitoring, habitat quality assessments and annual inspections. All results must be recorded for annual reporting.

8.2.4 Frequency

Biomass monitoring will be undertaken at the end of the wet season to inform grazing management requirements for the upcoming dry season. Fuel load monitoring will also be undertaken at the end of the wet season to inform fuel load management requirements for the upcoming dry season. In the event that cattle are introduced during the dry season, a second biomass monitoring event is required as a follow-up to ensure biomass does not drop below the thresholds presented in **Table 7.6**.

8.3 Weed surveys

Weed surveys will be undertaken to:

- identify the target weeds for management
- identify the priority weed management areas
- assess the efficacy of the weed management program
- assess progress towards offset area outcomes
- identify risks and threats, and
- guide corrective actions and adaptive management.

8.3.1 Survey sites

Surveys will be undertaken at the 36 permanent surveys sites located within the offset area as identified in **Table 8.3** and shown on **Figure 3-1**. Fixed monitoring sites provide greater confidence in monitoring changes that have occurred over time, compared with re-randomised monitoring sites which are likely to reflect natural variation at the site level (Auld, 2009).

Table 8.3 Weed monitoring survey sites

Site ID	AU	GTRE – Code	GTRE – Condition
BC1	AU1	11.3.25	REM
BC2	AU1	11.3.25	REM
BC3	AU2	11.11.1	REM
BC30	AU2	11.11.1	REM
BC4	AU3	11.11.15	REM
BC5	AU3	11.11.15	REM
BC6	AU3	11.11.15	REM
BC11	AU3	11.11.15	REM
BC31	AU3	11.11.15	REM
BC32	AU3	11.11.15	REM
BC9	AU4	11.11.15	REG

Site ID	AU	GTRE – Code	GTRE – Condition
BC34	AU4	11.11.15	REG
BC50	AU4	11.11.15	REG
BC35	AU5	11.11.15	NR
BC36	AU5	11.11.15	NR
BC37	AU6	11.12.6	REM
BC39	AU7	11.11.4	REM
BC40	AU7	11.11.4	REM
BC41	AU7	11.11.4	REM
BC42	AU7	11.11.4	REM
BC14	AU8	11.11.4	REG
BC43	AU8	11.11.4	REG
BC44	AU8	11.11.4	REG
BC45	AU8	11.11.4	REG
BC15	AU9	11.11.4	NR
BC46	AU9	11.11.4	NR
BC47	AU9	11.11.4	NR
BC17	AU10	11.11.4c	REM
BC48	AU10	11.11.4c	REM
BC49	AU10	11.11.4c	REM
BC18	AU11	11.12.1	REM
BC19	AU11	11.12.1	REM
BC20	AU11	11.12.1	REM
BC21	AU11	11.12.1	REM
BC25	AU11	11.12.1	REM
BC38	AU12	11.11.3	REM

* No data was collected at BC50 in Year 1 as the need for this site was only identified during the post field survey data analysis. Data must be collected at BC50 for all future monitoring events.

8.3.2 Method

Weed surveys will include weed cover surveys and photo-monitoring as per the methods outlined below.

8.3.2.1 Weed cover

Weed cover surveys will be undertaken within each 50 x 10 m BioCondition plot as follows:

- Establish a temporary quadrat.
- Slowly traverse the quadrat in a systematic manner and record the weed species present.
- Visually estimate the percentage of the quadrat occupied by each weed species.
- Assign a percentage cover for each weed species and record this in the field datasheet.
- **Figure 8-1** (McNaught, Thackway, Brown, & Parsons, 2008) should be used to assist in estimating percentage cover. Actual percentage cover estimates must be used (rather than using the modified Braun-Blanquet

method), as actual values can be converted to these broader indices for mapping or can be analysed separately (Watson, French, Burley, Brading, & Hamilton, 2021).

- The entire cover of each species must be recorded, irrespective of any overlap by a different species (i.e. the combined cover value of all target species may exceed 100%) (Watson, French, Burley, Brading, & Hamilton, 2021).

8.3.2.2 Photo-monitoring

Images must be captured at the centre point of each BioCondition transect in a north, east, south, west and ground direction. Photo monitoring must be undertaken as follows:

- Photos must be taken from 1.5 m height above ground level.
- A fixed reference object must be included in the frame such as a distinctive tree, tree stump, fence post or water feature, to help compare changes over time.
- Geo-referencing settings must be enabled to record the photo location data.
- Note that, for repeat photos, take the photo at the same time each year to enable meaningful comparison over time and have copies of the original photos for reference to help match the field of view.

8.3.3 Frequency

Weed surveys will be undertaken by a suitably qualified person with a minimum of 5 years industry field experience in Year 3 = 2027, Year 5 = 2029, Year 10 = 2034, Year 15 = 2039 and Year 20 = 2045.

8.4 Pest animal surveys

Pest animal surveys will be undertaken to

- identify the target pests for management
- assess the efficacy of the pest animal management program
- assess progress towards offset area outcomes
- identify risks and threats, and
- guide corrective actions and adaptive management.

8.4.1 Survey sites

Remote sensing camera traps will be deployed throughout the offset area to assess pest animal activity. A single (Swift Enduro Motion Camera or equivalent) camera will be deployed in each AU at the sites listed in **Table 8.4**. During baseline surveys in 2025, a pest monitoring site was not established within AU12. A new monitoring site will be established within this AU at all subsequent monitoring events.

8.4.2 Method

Cameras will be deployed for a minimum of 14 consecutive survey nights. Camera traps will not be baited to avoid interference with predator behaviour. They will be placed along obvious fauna trails or in areas where pest animals are likely to traverse. At each camera trap location, the following data will be collected:

- site ID
- survey type (i.e. camera)
- deployment date
- collection date.

Following the deployment period, Activity Indices for pest fauna will be calculated using the following methodology:

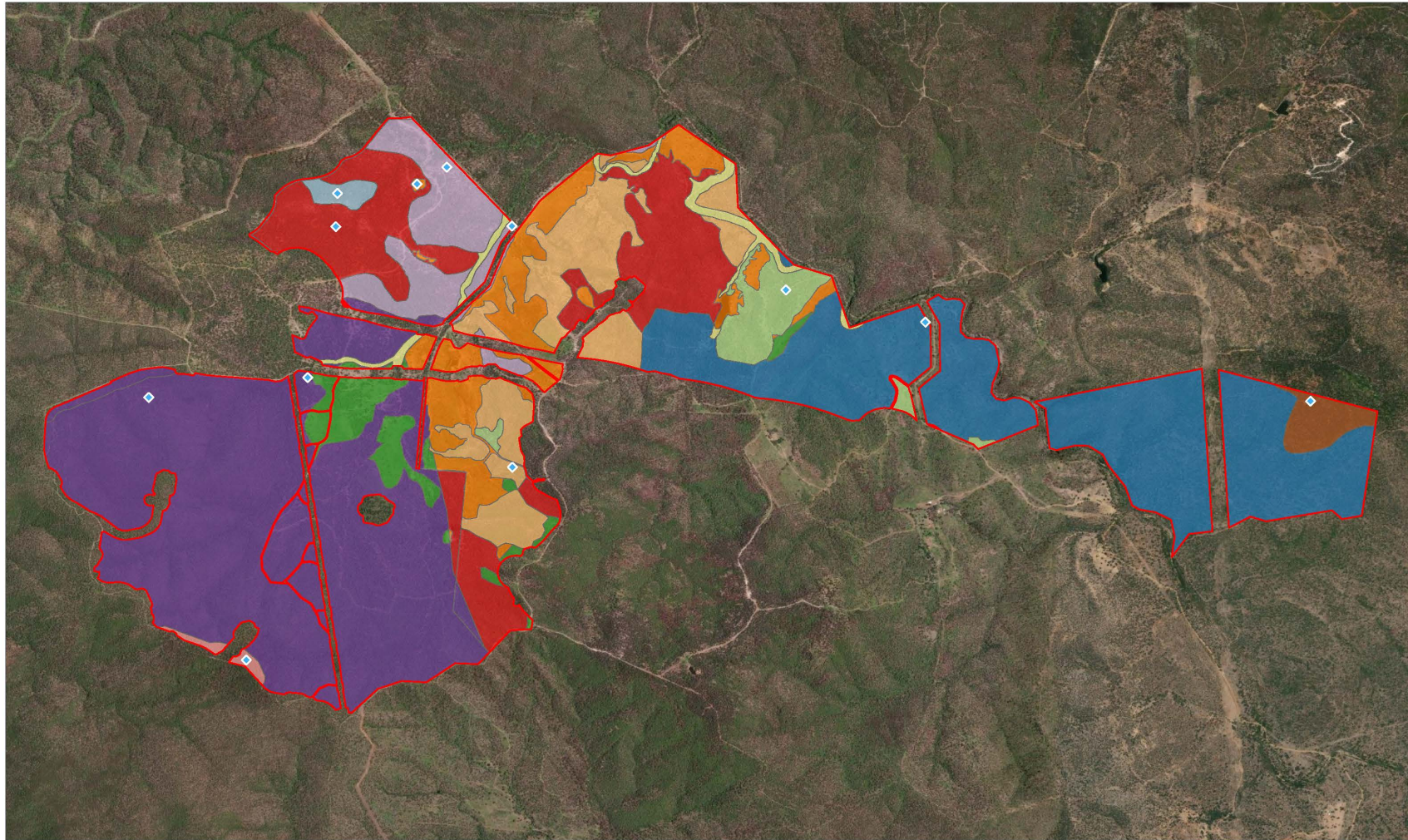
- All photos from cameras will be analysed using AddaxAI (an AI supported photo recognition software tool) followed by manual validation to identify species recorded.
- Pest animal observations will be recorded per day to calculate the total number of days where each species was observed. The analysis will not incorporate finer scale observations (i.e. multiple observations of a pest species within the single day)
- The number of species individual events is totalled within each assessment unit, then using the Catling Index Value (Mitchell & Balogh, 2007) a measure of pest animal presence/activity is calculated. This is calculated using the following formula: *Number of trap nights with pest records / total number of trap nights X 100.*

Table 8.4 Pest animal camera trap sites per assessment unit

Assessment Unit	GPS Co-ordinate
1	150.282841, -23.660191
2	150.27241, -23.658252
3	150.309514, -23.666732
4	150.300523, -23.664539
5	150.270687, -23.6703
6	150.266493, -23.688623
7	150.272353, -23.660729
8	150.283143, -23.676401
9	150.277115, -23.658093
10	150.278424, -23.656482
11	150.260391, -23.672102
12	TBD

8.4.3 Frequency

Pest animal surveys will be undertaken by a suitably qualified person with a minimum of 5 years industry field experience in Year 3 = 2027, Year 5 = 2029, Year 10 = 2034, Year 15 = 2039 and Year 20 = 2045.



Boulder Creek
Wind Farm

Pest animal survey sites
Figure 8-2

◆ Pest Animal Survey Sites
 [Red Outline] Offset area boundary

Offset Area Assessment Unit (AU)

[Yellow]	1
[Light Blue]	2
[Blue]	3
[Light Green]	4
[Green]	5
[Pink]	6
[Red]	7
[Orange]	8
[Dark Orange]	9

[Purple]	10
[Dark Purple]	11
[Brown]	12

DWG No: AUL-004-012[A]
 DATE: 11/11/2025
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 SCALE (A4): 1:25,000



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Figure 8-2 Pest animal survey sites

8.5 Habitat quality assessments

Habitat quality assessments will be undertaken to:

- assess the efficacy of the Stage 1 OAMP
- assess progress towards offset area outcomes
- identify risks and threats, and
- guide corrective actions and adaptive management.

8.5.1 Survey sites

Habitat quality assessments will be undertaken at the habitat quality survey sites for the koala and *Cycas megacarpa* offset areas as presented in **Table 8.5**, and illustrated on **Figure 3-1**. The total number of habitat quality survey sites within the koala offset area is 34 and the total number of sites within the *Cycas megacarpa* offset area is 15. Note that, no data was collected at BC50 in Year 1 as the need for this site was only identified during the post field survey data analysis. Data must be collected at BC50 for all future monitoring events and will be incorporated into the habitat quality assessment for *Cycas megacarpa* only. Habitat quality assessments must be undertaken by a senior suitably qualified person with a minimum of 5 years industry field experience.

Table 8.5 Habitat quality survey sites

Site ID	Original /New Site	AU	GTRE – Code	GTRE – Condition	Habitat Quality Survey Site – Koala	Habitat Quality Survey Site – <i>Cycas megacarpa</i>
BC1	Original	AU1	11.3.25	REM	✓	
BC2	Original	AU1	11.3.25	REM	✓	
BC3	Original	AU2	11.11.1	REM	✓	
BC30	New	AU2	11.11.1	REM	✓	
BC4	Original	AU3	11.11.15	REM	✓	✓
BC5	Original	AU3	11.11.15	REM	✓	
BC6	Original	AU3	11.11.15	REM	✓	
BC11	Original	AU3	11.11.15	REM	✓	
BC31	New	AU3	11.11.15	REM	✓	
BC32	New	AU3	11.11.15	REM	✓	✓
BC9	Original	AU4	11.11.15	REG	✓	
BC34	New	AU4	11.11.15	REG	✓	
BC50*	New	AU4	11.11.15	REG		✓
BC35	New	AU5	11.11.15	NR	✓	✓
BC36	New	AU5	11.11.15	NR	✓	✓
BC37	New	AU6	11.12.6	REM	✓	✓
BC39	New	AU7	11.11.4	REM	✓	✓
BC40	New	AU7	11.11.4	REM	✓	✓
BC41	New	AU7	11.11.4	REM	✓	
BC42	New	AU7	11.11.4	REM	✓	

Site ID	Original /New Site	AU	GTRE – Code	GTRE – Condition	Habitat Quality Survey Site – Koala	Habitat Quality Survey Site – <i>Cycas megacarpa</i>
BC14	Original	AU8	11.11.4	REG	✓	
BC43	New	AU8	11.11.4	REG	✓	✓
BC44	New	AU8	11.11.4	REG	✓	✓
BC45	New	AU8	11.11.4	REG	✓	
BC15	Original	AU9	11.11.4	NR	✓	
BC46	New	AU9	11.11.4	NR	✓	✓
BC47	New	AU9	11.11.4	NR	✓	✓
BC17	Original	AU10	11.11.4c	REM	✓	
BC48	New	AU10	11.11.4c	REM	✓	
BC49	New	AU10	11.11.4c	REM	✓	
BC18	Original	AU11	11.12.1	REM	✓	✓
BC19	Original	AU11	11.12.1	REM	✓	✓
BC20	Original	AU11	11.12.1	REM	✓	✓
BC21	Original	AU11	11.12.1	REM	✓	
BC38	New	AU12	11.11.3	REM	✓	
Total Survey Sites					34	15

8.5.2 Method

Habitat quality assessments will be undertaken in accordance with the Boulder Creek Offset Area Modified Habitat Quality Assessment Method (BCOA MHQA method) (Attexo, 2025b) presented in **Appendix A**. The BCOA MHQA method provides detailed guidance on the development of habitat quality scores for both koala and *Cycas megacarpa*. These methods provide future assessors with a repeatable assessment methodology to score habitat quality in the Stage 1 BCOA enabling meaningful assessment of the offset’s progress towards its interim milestones and completion criteria.

8.5.3 Frequency

Habitat quality assessments will be undertaken by a suitably qualified person with a minimum of 5 years industry field experience every 5 years until completion criteria are achieved (i.e. Year 5 = 2029, Year 10 = 2034, Year 15 = 2039, Year 20 = 2045).

8.6 *Cycas megacarpa* targeted surveys

Cycas megacarpa targeted surveys will be undertaken to record species occurrence and recruitment in areas where existing suitable habitat is known to be present.

8.6.1 Survey sites

Cycas megacarpa targeted surveys will be undertaken within 15 pre-allocated survey sites. *Cycas megacarpa* survey sites are collocated with a subset of the habitat quality assessment sites as summarised in **Table 8.6**, and shown on **Figure 3-1**.

8.6.2 Method

At each survey site, a systematic meander must be conducted within a designated 0.5 ha quadrat (100 m x 50 m plot). All areas of the quadrat must be inspected and the following information recorded:

- Direct counts of all individuals. To avoid overcounting, surveyed individuals must be marked with biodegradable survey paint.
- Age category of individual, whereby only two age categories are utilised (seedling and subadult). Individuals without an observable above-ground stem are recorded as ‘seedling’ and individuals with an observable above-ground stem are recorded as ‘sub-adult’.

Cycas megacarpa targeted surveys must be undertaken by a senior suitably qualified person with a minimum of 5 years industry field experience.

Table 8.6 *Cycas megacarpa* survey sites

Survey Site	AU	GTRE – Code	GTRE – Condition
BC4	AU3	11.11.15	REM
BC18	AU11	11.12.1	REM
BC19	AU11	11.12.1	REM
BC20	AU11	11.12.1	REM
BC25	AU11	11.12.1	REM
BC32	AU3	11.11.15	REM
BC35	AU5	11.11.15	NR
BC36	AU5	11.11.15	NR
BC37	AU6	11.12.6	REM
BC39	AU7	11.11.4	REM
BC40	AU7	11.11.4	REM
BC43	AU8	11.11.4	REG
BC44	AU8	11.11.4	REG
BC46	AU9	11.11.4	NR
BC47	AU9	11.11.4	NR
BC50*	AU4	11.11.15	REG

*BC50 was not assessed during the Year 1 event but will be established for subsequent monitoring events.

8.6.3 Frequency

Cycas megacarpa targeted surveys will be undertaken by a suitably qualified person with a minimum of 5 years industry field experience every 5 years until completion criteria are achieved (i.e. Year 5 = 2029, Year 10 = 2034, Year 15 = 2039, Year 20 = 2045).

8.7 Koala targeted surveys

Targeted koala surveys will be undertaken to detect species presence and assess habitat utilisation and dispersal.

8.7.1 Survey sites

Targeted surveys will be completed within representative areas of Stage 1 BCOA.

8.7.2 Method

Direct and indirect koala survey techniques have been selected to determine the presence of the species and assess habitat utilisation and dispersal. Where koalas are detected on site, their location, any young present and tree species they are present in (or if detected on ground) will be recorded to assist in assessing the presence of populations, habitat utilisation and dispersal across the offset.

8.7.2.1 Direct survey techniques

Direct survey techniques for koala may include a combination of spotlighting and thermal drone surveys. Spotlighting will include walking transects with 2 personnel shining torches through the canopy to detect eyeshine and recording all species observed (and tree species in which koalas are present). Spotlighting within representative areas of koala habitat allows for detection of presence with improved performance over daytime surveys for lower density populations (Youngentob, Marsh, & Skewes, 2021). Thermal drone surveys will be undertaken in accordance with the National Koala Monitoring Program Methodologies - Drones (DCCEEW, 2025).

8.7.2.2 Indirect survey techniques

Call playback during spotlighting surveys allows for additional detection opportunities during breeding season vs spotlighting alone, whereby male koalas may audibly respond to prerecorded calls. These surveys allow for detection of species presence and may improve estimations of species occupancy (Youngentob, Marsh, & Skewes, 2021). Call playback surveys will involve broadcasting a recording of male koala bellowing and listening for responses from other males that may be proximal. These surveys will only be conducted on suitable nights during the breeding season where strong winds and rain are absent.

Scat surveys involve searching for koala scats under trees within a specified area of interest and are often used to establish koala presence and provide some indication of activity levels (Youngentob, Marsh, & Skewes, 2021). Scat surveys during offset monitoring will be based on the Balanced Koala Scat Survey (BKSS). The BKSS protocol (Jiang, Tribe, & Murray, 2019) is an adapted scat survey method incorporating aspects of the Spot Assessment Technique (SAT) and Koala Rapid Assessment Method (KRAM) developed to overcome biases and inefficiencies of those methods (Youngentob, Marsh, & Skewes, 2021). BKSS includes random selection of a centre tree of the survey site with a minimum diameter at breast height (DBH) of 10 cm. A thorough search of the ground for koala scats in a 1 m radius surrounding this tree is completed. If any Koala scats are detected, they are recorded and then the search will move on to the next nearest tree with a minimum DBH of 10 cm. If no koala scats are recorded within the 1 m radius, then the search method will move on only once a thorough search of the 1 m radius is completed. The search continues until the centre tree and the next nearest 29 trees have been searched.

8.7.3 Frequency

Targeted surveys for koala will be undertaken by a suitably qualified person with a minimum of 5 years industry field experience. Baseline surveys will be conducted in Year 2 = 2026, Year 5 = 2029, Year 10 = 2034, Year 15 = 2039 and Year 20 = 2045). Surveys will be planned for August – February when the species is most active and most likely to be detected (Queensland Government, 2019).

9. Corrective actions

The risk assessment presented in **Appendix B** identifies a range of corrective actions to be implemented to address the potential risks to achieving the offset area outcomes. A summary of these corrective actions, including associated monitoring activities, and timing for implementation, are presented in **Table 9.1**.

Table 9.1 Risks to offset outcomes and proposed corrective actions

Risk	Corrective Action Trigger	Related Monitoring Activity	Corrective Actions	Timing for Corrective Action
Offset area is not secured via legally binding mechanism	Corrective action trigger: <ul style="list-style-type: none"> the offset area has not been legally secured within 12 months of commencement of the action (i.e. secured by 13 January 2026) 	NA	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reason why the legally binding mechanism is not secured. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Follow up progress of application with relevant department and determine reason for delay. Confirm any issues with DCCEEW, and advise timing for the mechanism to be in place. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective action one month prior to the date that the legal mechanism should be secured (i.e. 13 December 2025).</p>
Non-compliance with Offset Agreement or OAMP by landholder	Corrective action trigger: <ul style="list-style-type: none"> Non-compliance with Offset Agreement and OAMP by landholder. 	NA	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reason for the non-compliance. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> BCWF to exercise its legal/contractual rights. Note in addition to a comprehensive dispute resolution framework, the Offset Agreement contains a specific process for BCWF to direct the landowner to remedy offset management issues and for BCWF to appoint a third party to remedy such issues if ultimately required. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>BCWF meet with associated parties within 5 business days of becoming aware of clearing.</p> <p>Implement appropriate corrective action within 3 months of non-compliance.</p>
Unapproved clearing of native vegetation within the offset area.	Corrective action trigger: <ul style="list-style-type: none"> Evidence of unapproved clearing of native vegetation within the offset area. 	Incidental observations or Annual inspections as per Section 8.1	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate how unauthorised clearing occurred. Assess the extent of unauthorised clearing and identify appropriate corrective actions. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Meet with landholder/parties associated with clearing and discuss breach of contract and rectification measures. Installation of additional fencing and/or signage and security for the offset area. Notify relevant department/s of unapproved clearing. Additional habitat quality assessments to assess any damage and progress toward recovery to meet the next interim milestones or completion criteria. Develop Restoration Plan for the impacted/cleared area to ensure completion criteria can be achieved, including any maintenance and monitoring. DCCEEW to approve Restoration Plan prior to implementation. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>BCWF meet with associated parties within 5 business days of becoming aware of clearing.</p> <p>Implement appropriate corrective action within 3 months of unapproved clearing.</p>

Risk	Corrective Action Trigger	Related Monitoring Activity	Corrective Actions	Timing for Corrective Action
Unauthorized access within the offset area.	Corrective action triggers: <ul style="list-style-type: none"> broken/tampered fences evidence of unauthorised activities. 	Incidental observations or Annual inspections as per Section 8.1	Step 1: Investigate cause of trigger: <ul style="list-style-type: none"> Investigate how and why unauthorised access occurred. Assess the extent of impact from unauthorised access. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> If access restrictions are not successful, implementation of camera monitoring to identify perpetrators. Notification to police and DCCEEW if suspected/substantiated unlawful access and damage to MNES. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident. Implement appropriate corrective action within 3 months of becoming aware of unauthorised access
Grazing management not in accordance with OAMP including: <ul style="list-style-type: none"> Livestock found in exclusion areas Livestock found in offset area in wet season. Significant degradation of riparian areas from cattle grazing are observed. Translocated cycads damaged by livestock. Regenerating vegetation is being heavily browsed. Soil degradation including significant areas of erosion and compaction soil caused by cattle. 	Corrective action triggers: <ul style="list-style-type: none"> broken/tampered fences evidence of livestock in exclusion areas evidence of degradation by livestock. 	Incidental observations or Annual inspections as per Section 8.1	Step 1: Investigate cause of trigger: <ul style="list-style-type: none"> Evaluate the reason for the breach. Evaluate damage and if any restoration is required. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> Remove livestock from exclusion areas. Remove livestock from riparian areas Lower stocking rate Reduce stocking rate or prohibit grazing year-round Rectify fencing to prevent future breaches. Reevaluate type of fence and change fencing design if fencing isn't found to effectively exclude cattle. Install electric fences to restrict cattle access to riparian areas. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident. Immediately remove livestock once observed within the exclusion area. Lower stocking rate or remove livestock within 10 business days. Fencing to be rectified within 30 days of damage being noted. Electric fencing installed within 6 months of degradation being observed. For impacts on translocated cycads, implement any corrective action on damaged cycad as determined within the CMTMP.
Damage to native vegetation surrounding dams is evident.	Corrective action trigger: <ul style="list-style-type: none"> damage to native vegetation surrounding dams is observed 	Incidental observations or Annual inspections as per Section 8.1	Step 1: Investigate cause of trigger: <ul style="list-style-type: none"> Evaluate the reason for the damage. Evaluate damage and if any restoration is required. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> Revegetate within 5m of the dam with a 1:3 replacement with tubestock of locally native species. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident. If required, revegetation to occur within 6 months of damaged vegetation being observed, or within the next suitable planting window, whichever is sooner.
Increase in % cover and richness of weed species at monitoring sites from baseline and subsequent monitoring events	Corrective action triggers: <ul style="list-style-type: none"> weed cover performance targets are not achieved new weed species identified through monitoring event. 	Weed surveys as per Section 8.2	Step 1: Investigate cause of trigger: <ul style="list-style-type: none"> Investigate the reasons that may have attributed to the increase in the species richness or cover of weeds. Investigate potential sources of new weed species occurrence. Review adherence to weed control and management actions. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> Amend weed hygiene requirements and provide additional education/awareness to contractors and personnel entering the site to ensure restrictions are adhered to. Increase the frequency and intensity of weed control and management activities. Third party review of weed control and management activities and identification of revised suitable methods. Ensure coordination with neighbours and community, where suitable, to ensure a consistent approach to management. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident. Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.

Risk	Corrective Action Trigger	Related Monitoring Activity	Corrective Actions	Timing for Corrective Action
<p>Increased presence of pest animals in the offset area from baseline and subsequent monitoring events</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> observed increase in incidental sightings of pigs or dogs. 10% increase in baseline activity indices. evidence of direct impact on cycads or koala from pest animals. 	<p>Incidental observations or pest animal surveys as per Section 8.4</p>	<p>Step 1: Investigate cause of trigger</p> <ul style="list-style-type: none"> Investigate the reasons that may have attributed to the increase in the score AI for the relevant pest animals Review adherence to pest animal control and management actions. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Increase the frequency and intensity of pest animal control and management activities Third party review of pest animal control and management activities and identification of revised suitable methods. Ensure coordination with neighbours and community, where suitable, to ensure a consistent approach to management. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.</p>
<p>Inappropriate fire regime, increased fire risk or unplanned fire event occurs</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> fuel loads are higher than what is typical for the relevant ecosystem as determined by the suitable qualified bushfire consultant within annual bushfire reporting access tracks are overgrown unmaintained fire breaks occurrence of an uncontrolled fire (i.e. any fire that is not deliberately lit as part of the prescribed fire regime and/or one that is unable to be contained despite firefighting efforts). 	<p>Incidental observations or Annual inspections as per Section 8.1</p>	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reasons why fuel loads have exceeded thresholds or unplanned fire has occurred. Review adherence to fire management protocols and activities. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Increase the frequency of biomass monitoring. Alter timing and frequency of selective grazing. Increase the frequency of weed control measures. Review the effectiveness of firebreaks and if required establish additional fire breaks and/or widen existing firebreaks. Inspect and maintain fire breaks more regularly, including prior to the peak fire season each year (August – December). Implement fuel load reduction actions that are most appropriate for the area and conditions. Review the timing, frequency and intensity of fuel hazard reduction burns for the particular offset value and vegetation communities. Should unplanned fire occur, undertake an assessment of the impacted area (within 2 months of the fire event) Evaluate impact of unplanned fire on achieving offset area outcomes and develop bushfire recovery program if deemed necessary Third party review of fire management protocols and activities, to advise on amendments or additional measures required. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective actions within 2 months of becoming aware of corrective action triggers.</p>
<p>Insufficient funds provided by approval holder to implement the OAMP.</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> Change in proponent. Budget exceeded. 	<p>NA</p>	<p>Step 1: Investigate cause of trigger</p> <ul style="list-style-type: none"> Investigate the reasons why budget has been exceeded. Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Ensure any new proponent is aware of offset requirements and associated costs. Review management activities / contractor procurement processes if annual budgets are exceeded. Review appropriateness of offset management budgets / funding. For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.</p>

Risk	Corrective Action Trigger	Related Monitoring Activity	Corrective Actions	Timing for Corrective Action
<p>Offset area outcomes are not achieved in required timeframes.</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> • Interim milestone not achieved • Performance target not achieved • Completion criteria not achieved 	<p>Habitat quality assessments as per Section 8.5</p>	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> • Investigate reasons why the performance targets, interim milestones or completion criteria were not achieved within the specified timeframes. • Re-evaluate the suitability of the relevant management measures in the OAMP and identify appropriate corrective actions. • Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • Third party review of OAMP efficacy and revise management actions such as: <ul style="list-style-type: none"> – Replace fencing structures to ensure management of stock according to the designated management zones. – Increase weed control. – Rectify erosion issues. – Place tree guards around young regenerating saplings to reduce browsing by native herbivores. – Modify fire management strategy – Increase fuel load management and monitoring frequency. – Conduct ripping, direct seeding and supplementary planting of tubestock in the regenerating areas. • Increase monitoring frequency to every 2 years to gauge effectiveness of corrective actions. • If it is considered that the completion criteria cannot be achieved BCWF will notify DCCEEW and, if required, provide alternative offset areas to acquit the required offset requirements. • For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.</p>
<p>Stochastic events (wildfire/drought/flood) prejudice attainment of completion criteria.</p>	<p>Corrective action trigger:</p> <ul style="list-style-type: none"> • Unplanned fire, drought or flood impacts offset within years 15 to 20. 	<p>Incidental observations</p>	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> • Re-evaluate the suitability of the relevant management measures in the OAMP and identify appropriate corrective actions. • Assess whether the trigger constitutes an incident as defined in the EPBC Act approval. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • Undertake risk assessment to determine the impact of the stochastic event on the achievement of offset area outcomes within the remaining timeframes. • Revise OAMP management and monitoring actions and frequencies. • Extend the life of the offset to beyond 20 years. • If it is considered that the completion criteria cannot be achieved BCWF will notify DCCEEW and, if required, provide alternative offset areas to acquit the required offset requirements. • For confirmed incidents under the EPBC Act approval, report non-compliance in accordance with Conditions 67 and 68 of the EPBC Act approval. 	<p>In accordance with Conditions 67 and 68 of the EPBC Act approval, if the trigger constitutes an incident, notification must be made to DCCEEW no later than 2 business days after becoming aware of the incident, and corrective actions must be reported no later than 10 business days after becoming aware of the incident.</p> <p>Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.</p>

10. Reporting and data management

Environmental offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. To support transparent governance arrangements, and demonstrate compliance with the OAMP, regular reporting and data management is proposed as outlined below.

10.1 Annual report

An Annual Report will be prepared within 60 business days following the anniversary of the commencement of the action (i.e. by 10th April) each year until the achievement of completion criteria. The Annual Report will be prepared by suitably qualified personnel and will be signed off by BCWF. The Annual Report will include:

- a description of all management actions completed (methods and locations) in the preceding 12-month period
- a description of the monitoring activities that were completed and results, including the outcomes of annual inspections
- identification of any constraints to monitoring and/or management actions over that timeframe (e.g. inability to access offset area due to flooding or other weather events, etc.)
- identification of any significant risks or potential threats to the offset and offset values that have become apparent and how they will be addressed
- any corrective actions triggers, and associated responses implemented during the 12-month period
- any learnings from implementation of the OAMP and monitoring
- any changes to the OAMP that may be proposed and justification.

10.2 Five yearly reports

At the completion of every five years (i.e. Year 5 = 2029, Year 10 = 2034, Year 15 = 2039, Year 20 = 2045) the Annual Report will become the Five Yearly Report. The Five Yearly Report will be submitted to DCCEEW for review. If changes to the OAMP are proposed and agreed, the OAMP will be updated and a new revision approved. The Five Yearly Report will:

- Document the results of the habitat quality assessment and other monitoring undertaken in accordance with **Section 8**.
- Assess how the offset is tracking against the offset area outcomes set out in **Section 5**, including whether the offset is likely to achieve the milestones, performance targets and completion criteria in adequate time based on current management actions, or if adaptive management is required.
- Review the effectiveness of the management program. The review will consider:
 - i. Is the management program achieving the desired outcomes?
 - ii. Are the management frequencies suitable?
 - iii. Is the management program efficient or are there improvements that could be made?
 - iv. What changes may be justified and why?
- Review the effectiveness of the monitoring program. The review will consider:

- v. Are the monitoring methods effective and providing the information required?
- vi. Are the monitoring frequencies suitable?
- vii. Is the monitoring program efficient or are there improvements that could be made?
- viii. What changes may be justified and why?

If corrective actions have been implemented these will be outlined and an evaluation of their success described. The report will then include recommendations for the next five years including any adaptive management that could be applied based on learnings from previous five years on the offset, or any new technology or learnings that may be relevant to each MNES or land management practices.

10.3 Data management

BCWF will ensure that all data collected as part of the OAMP implementation is managed and stored appropriately. A centralised spatial repository of all offset area data will be established to ensure proper data quality assurance, storage and protection occurs. Key features of the data management will be:

- spatial data collection proformas for use in the field to ensure robust data is collected, and in a consistent manner
- establishment of a geodatabase for management of spatial data
- standardised data collection methods by qualified personnel, particularly for monitoring so that it is completed consistently each year to enable comparison of results
- quality assurance review process by suitably qualified persons
- version control of data and reports
- appropriately stored information for future use and reference.

A summary of data associated with the baseline (Year 1) surveys is presented in **Table 10.1**.

Table 10.1 Data required for OAMP monitoring

Data	Description	Associated Dataset Name
Survey Site Locations	Spatial dataset showing the location of weed survey sites, pest animal survey sites, Cycas megacarpa survey sites and habitat quality assessment survey sites	BCOA_Final Survey Sites_2025.gdb
Raw BioCondition Data	Raw data outputs and data collation spreadsheet	Stage 1 BCOA_BioCondition_RawData_Year 1.xlsx
Habitat Quality Assessment Data - Koala	MHQA spreadsheets for the koala offset area	Stage 1 BCOA_Koala Offset_Year 1_HQ Scores.xlsx
Habitat Quality Assessment Data – Cycas megacarpa	MHQA spreadsheets for the Cycas megacarpa offset area	Stage 1 BCOA_Cycad Offset_Year 1_HQ Scores.xlsx
Weed Cover Data	Weed cover data	BCOA_BioCondition_RawData_Year 1.xlsx
Photo-monitoring Images	Baseline photo-monitoring data	BCOA_Baseline_photo_monitoring_data_Year 1

10.4 Experience and qualifications of third parties

BCWF will engage third parties who are appropriately experienced and licenced to deliver key aspects of the OAMP relating to weed control, pest animal control, bushfire management and ecological monitoring. BCWF is prioritising local participation in the Project, and it is anticipated that contractors, including landholders where appropriate, will be sourced to implement the Stage 1 BCOA from the local region with the following pre-qualifications:

- Weed managers must have experience with weed control in native bushland settings and have an ACDC license.
- Pest animal managers must hold a current Queensland pest management licence under the *Medicines and Poisons Act 2019* and a relevant pest management qualification (e.g. a statement of attainment issued by a registered training organisation under the Vocational Education and Training (*Commonwealth Powers*) Act 2012).
- Competent fire practitioners must have a minimum of 5 years' experience in designing bushfire regimes for the purposes of maintaining biodiversity and appropriate bushfire regimes for regional ecosystems, as well as experience in assessing fuel loads using the Overall Fuel Hazard Assessment Guide (Hines, Tolhurst, Wilson, & McCarthy, 2010).
- Ecological monitoring consultants must have experience with ecological restoration, vegetation management and monitoring of the target MNES species. Experience in completion of BioCondition assessment sites and habitat quality scoring is required.

11. Implementation schedule

Table 11.1 presents a summary of the implementation schedule for all management, monitoring and reporting activities outlined in the Stage 1 OAMP.

Table 11.1 Implementation schedule - management, monitoring and reporting

Activity	Year 1 - 2025	Year 2 - 2026	Year 3 - 2027	Year 4 - 2028	Year 5 - 2029	Year 6 - 2030	Year 7 - 2031	Year 8 - 2032	Year 9 - 2033	Year 10 - 2034	Year 11 - 2035	Year 12 - 2036	Year 13 - 2037	Year 14 - 2038	Year 15 - 2039	Year 16 - 2040	Year 17 - 2041	Year 18 - 2042	Year 19 - 2043	Year 20 - 2044	Details in Relevant Section of Stage 1 OAMP	
Management Program																						
Legal Security	✓																					Section 7.1
General restrictions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.2
Fencing and access	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.3
Weed management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.4
Pest animal management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.5
Grazing management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.6
Fire management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 7.7
Monitoring Program																						
Annual inspections	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 8.1
Fire management monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Section 8.2
Baseline weed survey	✓																					Section 8.3
Weed surveys			✓		✓					✓					✓						✓	Section 8.3
Baseline pest animal survey	✓																					Section 8.4
Pest animal survey			✓		✓					✓					✓						✓	Section 8.4
Baseline habitat quality assessments	✓																					Section 8.5
Habitat quality assessments					✓					✓					✓						✓	Section 8.5
<i>Cycas megacarpa</i> - Targeted surveys	✓				✓					✓					✓						✓	Section 8.6
Koala - Targeted surveys		✓			✓					✓					✓						✓	Section 8.7
Reporting																						
Annual report	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓			Section 10.1
5 yearly reports					✓					✓					✓						✓	Section 10.2

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Appendix A BCOA MHQA Methods



Attexó

Boulder Creek Offset Area

Modified Habitat Quality Assessment Method

Boulder Creek Wind Farm Pty Ltd

Date: 30 September 2025

Document information

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Date	30 September 2025
Prepared by	Matthew Whitehouse
Reviewed by	Kate McBean

Quality information

Rev	Date	Details	Authorisation	
			Name/position	Signature
1	30/09/2025	Final	Kate McBean, Principal Consultant – Biodiversity Offsets Service Line Lead	<i>Kate McBean</i>

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Contents

1. Introduction	4
2. MHQA methodology	5
2.1 Indicators and attributes.....	5
2.2 Score weighting.....	6
2.3 Site condition	6
2.3.1 Species habitat indices.....	8
2.4 Site context.....	8
2.4.1 Size of patch.....	9
2.4.2 Connectedness.....	9
2.4.3 Context.....	9
2.4.4 Ecological corridors.....	10
2.4.5 Role of site location for the population in the State	10
2.4.6 Threats.....	11
2.4.7 Species mobility capacity.....	12
2.5 Species stocking rate.....	12
3. Species-specific scoring parameters	13
3.1 Koala	13
3.1.1 Site condition – species habitat indices	13
3.1.2 Site context.....	14
3.1.3 Species stocking rate	16
3.2 Cycas megacarpa	18
3.2.1 Site Context	19
3.2.2 Species stocking rate.....	19
4. References	23

Appendices

Appendix A Regional Ecosystem and Species-Specific Benchmarks

Tables

Table 2.1: MHQA assessment components – indicators and attributes.....	5
Table 2.2: Default maximum indicator scores and weightings	6
Table 2.3: Scoring for the 13 site condition attributes.....	7
Table 2.4: Scoring for species habitat indices parameters.....	8
Table 2.5: Site context scoring attributes and maximum scores.....	8
Table 2.6: Scoring for size of patch.....	9
Table 2.7: Scoring for connectivity in the landscape	9
Table 2.8: Matter-specific context buffer distances.....	10
Table 2.9: Scoring for context	10
Table 2.10: Scoring for ecological corridors.....	10
Table 2.11: Definitions of habitat critical to the survival of the species (HCSS).....	11
Table 2.12: Scoring for role of the site location to species overall population in the state.....	11
Table 2.13: Scoring for threats.....	12

Table 2.14: Scoring for species mobility capacity.....	12
Table 3.1: Koala tree species utilise classes (DES 2023).....	13
Table 3.2: Quality and availability of food and foraging habitat parameter – koala.....	14
Table 3.3: Quality and availability of shelter parameters – koala.....	14
Table 3.4: Threats to the species – koala	15
Table 3.5: Species mobility capacity parameters – koala	15
Table 3.6: Definitions of ‘presence detected on or adjacent to site’ - koala.....	16
Table 3.7: Scoring for presence detected on or adjacent to site - koala.....	16
Table 3.8: Scoring for species usage of the site - koala.....	16
Table 3.9: Approximate density scoring – koala	17
Table 3.10: Supplementary scoring for role/importance of fauna species population on site.....	18
Table 3.11: Final scoring for role/importance of species population on site.....	18
Table 3.12: Threats to the species parameters – <i>Cycas megacarpa</i>	19
Table 3.13: Flora species stocking rate attributes and maximum scores.....	19
Table 3.14: Definitions of ‘presence detected on or adjacent to site’ for flora MNES values.....	20
Table 3.15: Scoring for presence detected on or adjacent to site for flora MNES values.....	20
Table 3.16: Number of plants recorded within the offset area.....	20
Table 3.17: Extent of population (ha) within the offset area.....	21
Table 3.18: Approximate density (per ha) over suitable habitat within the offset area	21
Table 3.19: Flora species stocking rate supplementary table attributes and maximum scores.....	21
Table 3.20: Supplementary scoring for role/importance of flora species population on site	22

1. Introduction

Habitat quality scoring is undertaken in accordance with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Modified Habitat Quality Assessment (MHQA) method. The MHQA method is an adaptation of the Queensland Government's *Guide to determining terrestrial habitat quality v1.2* (DEHP 2017; herein referred to as the Guide). It provides repeatable methods for habitat quality scoring and for determining offset requirements for significantly impacted Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The scoring process evaluates habitat quality for MNES at both the impact and offset area, for input into the EPBC Offset Assessment Guide (the calculator).

Most scoring procedures for the MHQA method are prescribed in the Guide (DEHP 2017); however, some inputs require assessment of matter-specific parameters to ensure scoring accuracy and consistency. Scoring for these matter-specific parameters are undefined in the MHQA method and therefore scoring methods and metrics must be developed for the unique ecological requirements and/or identified threatening processes of the MNES under assessment.

To compensate for the significant residual impact of the Project on two MNES (i.e. the koala [*Phascolarctos cinereus*] and *Cycas megacarpa*), environmental offsets have been established in accordance with the Project's approval conditions (EPBC 2020/8772). To ensure a consistent approach is undertaken for all future offset monitoring, and to ensure that a repeatable assessment methodology has been documented, this report has been prepared to outline:

- How the MHQA method has been applied including specific scoring procedures for **site condition, site context** and **species stocking rate (Section 2)**, particularly where these differ from the Guide, and
- Specific scoring procedures and metrics for selected parameters for each MNES where applicable (**Section 3**).

The scoring methodology presented in this document includes modifications from the impact and offset area scoring undertaken for the Project and documented in the original Stage 1 Offset Area Management Plan (Stage 1 OAMP; EMM 2024). These modifications have been made as the original Stage 1 OAMP did not expressly document the habitat quality assessment methods or scoring procedures, presenting challenges when replicating the assessment. To address this issue, this document outlines a detailed and specific habitat quality assessment method which is also utilised in the revised Stage 1 OAMP (Attexo 2025). All future habitat quality assessments must be undertaken using the methods outlined herein.

2. MHQA methodology

2.1 Indicators and attributes

The MHQA method relies on detailed assessment of three indicators:

1. **site condition**
2. **site context**
3. **species stocking rate** (SSR) (fauna and flora only).

Each indicator comprises multiple scoring attributes that integrate both site-specific field data and spatially derived data. All indicators and attributes that are assessed as part of the MHQA method are summarised in **Table 2.1**. In some instances, attribute scoring also incorporates matter-specific parameters to ensure a more accurate assessment of habitat quality. Where parameters are required to be assessed, these are clearly defined in this document.

As per the MHQA method, two scales of assessment are applied when scoring each indicator: the Assessment Unit scale and the Matter Area scale. As presented in **Table 2.1**, the Assessment Unit scale - referring to a subset of mostly homogenous sites (see Section 4.3 of the Guide) - is applied to **site condition** attributes, while all **site context** and **species stocking rate** attributes are assessed at the Matter Area scale (covering the entire impact or offset area for each individual MNES value). This approach differs from both BioCondition Manual (Eyre *et al* 2015) and the Guide.

Section 2.3, **Section 2.4** and **Section 2.5** outline the scoring procedure for the **site condition**, **site context** and **species stocking rate** indicators, respectively.

Table 2.1: MHQA assessment components – indicators and attributes

		Indicators		
		Site condition	Site context	Species stocking rate
Attributes	Recruitment of woody perennial species in EDL		Size of patch	Presence detected on or adjacent to site (neighbouring property with connecting habitat)
	Native plant species richness - trees		Connectedness	Species usage of the site (habitat type and evidenced usage)
	Native plant species richness - shrubs		Context	Approximate density (per ha)
	Native plant species richness - grasses		Ecological Corridors	Role/importance of species population on site
	Native plant species richness - forbs		Role of site location to species/TEC overall population in the State (i.e. Queensland)	Number of plants on site (flora only)
	Tree canopy height		Threats to the species	Extent of population (flora only)
	Tree canopy cover		Species mobility capacity (fauna only)	
	Shrub canopy cover			
	Native perennial grass cover			
	Organic litter			
Large trees				

		Indicators		
		Site condition	Site context	Species stocking rate
	Coarse woody debris			
	Non-native plant cover			
	Quality and availability of food and foraging habitat (fauna only)			
	Quality and availability of shelter (fauna only)			
Assessment Scale	Assessment Unit	Matter Area	Matter Area	Matter Area

2.2 Score weighting

Scores generated for each indicator are weighted and combined to generate a final habitat quality score. This score is expressed as a value out of 10; following standard rounding procedures, the score is provided as the nearest whole number. Standard maximum indicator scores and weightings are specified according to matter type (e.g. fauna, flora) but the combined scores, once finalised and appropriately weighted, always result in a final habitat quality score out of 10.

Table 2.2 summarises the maximum possible scores for each indicator alongside the standard weighting protocol. For the purpose of this assessment standard weighting protocols have been applied for both koala and *Cycas megacarpa*. Although not clearly defined in the *Guidance on the use of the Modified Habitat Quality Assessment method* (DCCEEW 2025), the default indicator weighting is based on koala habitat requirements and therefore will be retained for scoring. In addition, in the original approved OAMP (EMM 2024) the standard weighting protocol was used for *Cycas megacarpa* and for the purpose of consistency these weightings have been retained.

Table 2.2: Default maximum indicator scores and weightings

Matter type	Site condition		Site context		Species stocking rate	
	Maximum score	Maximum weighted score	Maximum score	Maximum weighted score	Maximum score	Maximum weighted score
Fauna	100	3 (30%)	56	3 (30%)	70	4 (40%)
Flora	80	3 (30%)	46	3 (30%)	105	4 (40%)

2.3 Site condition

The **site condition** indicator is primarily based on 13 pre-determined floristic and structural field attributes which are assessed in accordance with Section 5 of the Guide (DEHP 2017). This involves the establishment of 100 x 50 m sample sites (0.5 ha plots) in relevant representative vegetation types within which the site-specific field attributes are measured (see Section 4.4 of the Guide for how to determine the number and location of sample sites). Sub-plots and a central transect within the larger overall sample site are also used to measure specific data. At the offset sites, these plots are fixed and permanent.

Once field data is collected, scores are derived through comparison to benchmarks for regional ecosystems (RE) (from the *BioCondition Benchmark Database, Version 3.6* (Queensland Herbarium and Biodiversity Science 2025)), as outlined in Table 2 of the Guide and replicated below in **Table 2.3** (noting there are some errors in Table 2 of the Guide which have been corrected below as per guidance in the MHQA method). Relevant RE benchmarks for the Project and application of this method are presented in **Appendix A, Table A1**.

Table 2.3: Scoring for the 13 site condition attributes

Attribute	Attribute Measurement Area	Score categories and scales			
Recruitment of woody perennial species in EDL	100 x 50 m plot	Score	0	3	5
		Benchmark	<20%	>20-75%	>75%
Native plant species richness - trees	100 x 50 m plot	Score	0	2.5	5
		Benchmark	<25%	≥25-90%	≥90%
Native plant species richness - shrubs	50 x 10 m sub-plot	Score	0	2.5	5
		Benchmark	<25%	≥25-90%	≥90%
Native plant species richness - grasses	50 x 10 m sub-plot	Score	0	2.5	5
		Benchmark	<25%	≥25-90%	≥90%
Native plant species richness - forbs	50 x 10 m sub-plot	Score	0	2.5	5
		Benchmark	<25%	≥25-90%	≥90%
Tree canopy height	100 x 50 m plot	Score	0	3	5
		Benchmark	<25%	>25-70%	>70%
Tree canopy cover	100 m transect	Score	0	2	3
		Benchmark	<10%	>10%-<50%	>200%
Shrub canopy cover	100 m transect	Score	0	3	5
		Benchmark	<10%	≥10%–<50% or >200%	>50%–<200%
Native perennial grass cover	1 x 1 m sub-plots (x 5)	Score	0	1	3
		Benchmark	<10%	>10–50%	>50–90%
Organic litter	1 x 1 m sub-plots (x 5)	Score	0	3	5
		Benchmark	<10%	≥10%–<50% or >200%	>50%–<200%
Large trees	100 x 50 m plot	Score	0	5	10
		Benchmark	0%	0–50%	>50–100%
Coarse woody debris	50 x 20 m sub-plot	Score	0	2	5
		Benchmark	<10%	<50% or >200%	>50% or <200%
Non-native plant cover	50 x 10 m sub-plot	Score	0	3	5
				10	

Attribute	Attribute Measurement Area	Score categories and scales			
		% of weed cover	>50%	>25–50%	>5–25% <5%

2.3.1 Species habitat indices

The MHQA method incorporates two supplementary scoring attributes when assessing fauna species **site condition**, collectively referred to as **species habitat indices (SHI)**:

- **Quality and availability of food and foraging habitat**
- **Quality and availability of shelter**

Assessment of these **SHI** is undertaken in accordance with Section 7 of the Guide (DEHP 2017). Scoring for **SHI** relies on the development of species-specific parameters informed by the ecological requirements of each species. Examples include the *presence of micro-habitat features for shelter* or the *relative abundance of specific food resources*.

Scoring categories for **SHI** for koala follow the approach approved in the original Stage 1 OAMP (EMM 2024). These scoring categories are not consistent with those documented in the MHQA method and are presented in **Table 2.4**. As two parameters are used to score each **SHI**, the score all parameters are summed, and the final score is presented as a score out of 10 (i.e. the maximum score in the MHQA method).

Detailed **SHI** scoring parameters and their application for koala are presented in **Section 3.1.1**. **SHI** scoring attributes are not applicable to flora species and as such have not been included for *Cycas megacarpa*.

Table 2.4: Scoring for species habitat indices parameters

Attribute	Score	Score categories					
Quality and availability of food and foraging habitat (fauna only)	Score	0	1	2	3	4	5
Quality and availability of shelter (fauna only)	Score	0	1	2	3	4	5

2.4 Site context

The **site context** attributes, and assessment scales, are summarised in **Table 2.5**. The impact and offset area are located within fragmented landscapes, therefore the **site context** scoring protocols follow those in a fragmented landscape (Brigalow Belt bioregion). Scoring methods for each attribute are described below from **Section 2.4.1** to **Section 2.4.7**. As these attributes are scored at the matter area scale, there will be instances where fragmented assessment units can result in multiple scores for the same attribute. In these instances, the highest score has been adopted as a precaution.

Table 2.5: Site context scoring attributes and maximum scores

Attribute	Assessment Scale	Max Score
Size of patch	Matter Area	10
Connectedness	Matter Area	5
Context	Matter Area	5
Ecological Corridors	Matter Area	6
Role of site location to species/TEC overall population in the state	Matter Area	5

Attribute	Assessment Scale	Max Score
Threats	Matter Area	15
Species mobility capacity (fauna only)	Matter Area	10

2.4.1 Size of patch

Size of patch assessments are undertaken in accordance with Section 6.2 (Step 2) of the Guide (DEHP 2017). The scoring categories reflect those in Table 3 of the Guide and are replicated below in **Table 2.6**.

Table 2.6: Scoring for size of patch

Description	Score
<5 ha	0
≥5-25 ha	2
≥26-100 ha	5
≥101-200 ha	7
≥200 ha	10

2.4.2 Connectedness

Connectedness assesses how well the site is linked to surrounding habitat. It reflects the ability of species to move through the landscape between suitable habitat patches, which is essential for maintaining population viability. High connectedness enables fauna to move readily between habitats, while low connectedness increases the risk of population isolation (Eyre et al. 2015).

Assessment of **connectedness** generally follows Section 6.2 (Step 3) of the Guide, however, the MHQA method slightly modifies the Guide approach, by replacing 'remnant' vegetation with alternative spatial datasets which represent species-specific habitat (when available and relevant). **Connectedness** is scored using four broad categories consistent with Table 3 of the Guide as replicated below in **Table 2.7**.

Table 2.7: Scoring for connectivity in the landscape

Description	Maximum score
0-10%	0
>10% to <50%	2
50% to 75%	4
>75% or > 500 ha	5

2.4.3 Context

Context is assessed generally in accordance with Section 6 (Step 4) of the Guide. However, the MHQA method requires a matter-specific buffer distance to be applied rather than the standard 1 km buffer to 'better reflect the species mobility and utility of adjacent habitat'. Buffer distances to be applied for each MNES are listed in **Table 2.8**. **Context** is scored using four broad categories consistent with Table 3 of the Guide as replicated below in **Table 2.9**.

Table 2.8: Matter-specific context buffer distances

Matter	Buffer distance	Justification
Koala	10 km	According to Dique <i>et al.</i> (2003), the mean straight-line distance between the natal and breeding home ranges for koalas ranged from 300 m to 10.6 km and averaged 3.4 km for females and 3.5 km for males. 10 km is well above the average but also accounts for the maximum home range size.
<i>Cycas megacarpa</i>	1 km	This species has very minimal dispersal capabilities as seeds typically drop from the parent plant (DoE 2025). Considering the toxicity of these seeds, there are currently no fauna species known to aid with seed dispersal. As such, the standard 1 km buffer distance has been used for this species.

Table 2.9: Scoring for context

Description	Score
< 10% remnant vegetation	0
> 10% to 30% remnant vegetation	2
> 30% to 75% remnant vegetation	4
> 75% remnant vegetation	5

2.4.4 Ecological corridors

Proximity to **ecological corridors** is assessed in accordance with Section 6.2 (Step 6) of the Guide (DEHP 2017). Scoring is consistent with Table 3 of the Guide as replicated in **Table 2.10**.

Table 2.10: Scoring for ecological corridors

Description	Score
Not within	0
Sharing a common boundary	4
Within (whole or part)	6

2.4.5 Role of site location for the population in the State

Assessment and scoring of the **role of site location for the population in the State** is undertaken in accordance with Section 7.2 of the Guide (DEHP 2017). This attribute reflects the importance of the site for the overall population of the species in Queensland and is considered analogous to *Habitat critical to the survival of the species* (HCSS) as defined in the Commonwealth *MNES Significant impact guidelines 1.1* (DoE 2013), or where available, in accordance with matter-specific statutory documentation. As per DoE (2013) the definition of habitat critical to the survival of a species or ecological community refers to areas that are necessary:

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

The relevant definitions of HCSS used for each matter as part of scoring are summarised in **Table 2.11**. Scoring is consistent with Table 4 of the Guide as replicated in **Table 2.12**.

Definitions of HCSS for each matter is summarised in **Table 2.11**. The scoring categories used for this attribute are consistent with Table 4 of the Guide as replicated in **Table 2.12**, however the approach has been modified slightly. In instances where HCSS obviously occurs within the impact area/offset area based on these definitions then the highest score (5) is awarded. In instances where no HCSS is present then the lowest score (1) is awarded. For all other instances where it is hard to define HCSS for the species, a conservative approach has been taken, and a moderate score (4) is awarded.

Table 2.11: Definitions of habitat critical to the survival of the species (HCSS)

Matter	HCSS definition
Koala	<p>According to the species Conservation Advice (DCCEEW 2022), HCSS is broadly defined as: <i>areas that the species relies on to avoid or halt decline and promote the recovery of the species</i>. The following factors are to be considered when identifying HCSS:</p> <ul style="list-style-type: none"> • whether the habitat is used during periods of stress (e.g. flood, drought or fire) • whether the habitat is used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes) • the extent to which the habitat is used by important populations • whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development • whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements • whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation • any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community.
<i>Cycas megacarpa</i>	<p>As of 2007, only 46 populations of <i>Cycas megacarpa</i> had been identified, all of which are considered to be important populations. Whilst HCSS has not been explicitly defined for this species, due to their limited dispersal capabilities, any confirmed populations are likely to represent HCSS.</p>

Table 2.12: Scoring for role of the site location to species overall population in the state

Description	Score
Not or unlikely to be critical to species' survival	1
Likely to be critical to species' survival (i.e. there is some uncertainty)	4
Critical to species survival	5

2.4.6 Threats

For each MNES, **Section 3** provides a description of the species-specific threats, and justification for the inclusion or exclusion of each threat in the assessment process. For those threats proposed to be included in the assessment, parameters and score scales are defined in **Section 3**. Scoring for each parameter is consistent with Section 7.2 and Table 4 of the Guide (DEHP 2017), as replicated in **Table 2.13**. A slight modification on scoring is made where multiple parameters (i.e. threats) are assessed. For example, where two or more parameters are used, scores are combined

and transformed to a score out of 15 (e.g. summed score divided by the maximum possible score, then multiplied by 15).

Table 2.13: Scoring for threats

Description	Score
High threat level (i.e. likely to result in death, irreversible damage)	1
Moderate threat level	7
Low threat level (i.e. likely to survive)	15

2.4.7 Species mobility capacity

Species mobility capacity is only relevant for fauna species. Assessment and scoring for **species mobility capacity** is undertaken in accordance with Section 7.2 of the Guide. The Guide defines species mobility capacity as, *"the presence and severity of factors that would contribute to a reduction in the mobility of the species. For example, when a barrier to movement is created within or between habitats that is likely to result in a long-term reduction in genetic fitness or access to important resources"*.

For koala **Section 3.1.2.2** provides a description of the site-specific factors that may be contributing to a reduction in the mobility of the species and defines relevant parameters and scoring scales to assess these. Scoring for each parameter is consistent with Section 7.2 and Table 4 of the Guide, as replicated in **Table 2.14**. A slight modification on scoring is made where multiple parameters (i.e. factors impacting mobility capacity) are assessed. For example, where two or more parameters are used, scores are combined and transformed to a score out of 10 (e.g. summed score divided by the maximum possible score, then multiplied by 10).

Table 2.14: Scoring for species mobility capacity

Description	Score
Severely restricted (76–100% reduction)	1
Highly restricted (51–75% reduction)	4
Moderately restricted (26–50% reduction)	7
Minor restriction (0–25% reduction)	10

2.5 Species stocking rate

Assessment and scoring of the **species stocking rate (SSR)** indicator is exclusively based on the MHQA method and is only required for fauna and flora. Scoring inputs evaluate each species' broader distribution, abundance, and site use. The specific methods used for assessing **SSR** for koala and *Cycas megacarpa* are presented in **Section 3.1.3** and **Section 3.2.2**, respectively.

3. Species-specific scoring parameters

3.1 Koala

3.1.1 Site condition – species habitat indices

Scoring categories for **SHI** for koala, as outlined below, follow the overall approach approved in the original Stage 1 OAMP (EMM 2024). However, scoring scales and approaches have been better defined to ensure that future assessments can be consistently undertaken.

3.1.1.1 Quality and availability of food and foraging habitat

Koalas are obligate folivores, primarily feeding upon the leaves of eucalypts (the genera of *Eucalyptus*, *Corymbia* [*Blakella*], *Angophora*, *Syncarpia* and *Lophostemon*). They exhibit strong preferences for certain species depending on the region (DCCEEW 2022).

To help quantify the quality and availability of food and foraging resources for the koala within the offset area two parameters were selected. The *first parameter* was tree species utility (as defined in spatial modelling for koalas in south-east Queensland) (DES 2023) which was adopted as a suitable surrogate for identifying and ranking tree species that are known foraging resources for the koala. Tree species observed within each survey plot (100 m x 50 m) were assigned a tree species utility classification (DES 2023). This utility classification ranks the usefulness of tree species listed in the full regional ecosystem descriptions of the REDD database into 1 of 4 categories which are outlined in **Table 3.1**. The utility classification of each tree identified as part of the **Native plant species richness - trees** data collection during field surveys was identified and used to calculate the totals of these classes for each site. Scores were then assigned based on the score scaling presented in **Table 3.2**.

Table 3.1: Koala tree species utilise classes (DES 2023)

Tree species utilise class	Description
Higher	Species referred to in a variety of reports and literature, the majority of which were definitive studies, described as being an important utility species for koala.
Medium	Species referred to in some reports and literature, can be secondary or anecdotal reference to species used by koalas e.g. species included in a factsheet.
Lower	Species not referred to in any literature or considered a trace food species for koalas from a definitive study, and/or eucalypt.
None or unknown	Species not referred to in any literature, not a eucalypt, <i>Melaleuca</i> or <i>Lophostemon</i> .

The second parameter used to score this attribute was *tree canopy cover*, which was adopted as a surrogate to quantify the available foraging material within the offset area. For the purposes of this parameter, a consolidated canopy cover value of both the canopy and sub-canopy totals was used as koalas can forage within both strata. Additionally, only those trees identified under the utility classification above (i.e. higher, medium and lower) were incorporated into the scoring for this attribute. Scores were then assigned based on the score scaling presented in **Table 3.2**.

Table 3.2: Quality and availability of food and foraging habitat parameter – koala

Parameter	Parameter measurement area	Score					
		0	1	2	3	4	5
Tree species utility	100 m x 50 m plot	No recognised utility species	Lower utility species only	At least 1 medium utility species	Multiple medium utility species	At least 1 higher utility species	Multiple higher utilise species
Canopy Cover (%) of recognised utility species	100 m transect	<10% cover	10-20%	20-30%	30-40%	40-50%	>50%

3.1.1.2 Quality and availability of shelter habitat

Koalas are arboreal, obligate folivores with a highly specialised diet whose foraging habitat varies from season to season depending on resource availability (DCCEEW 2022). They often move across the ground between food and shelter sites, with this movement being more common in the breeding season. Shelter trees for koalas can include roadside and rail vegetation and paddock trees, however, they prefer larger areas of forest or woodland. Landscape features such as sheltered gullies, dense areas of vegetation (e.g. closed canopy forests), and vegetated watercourses are recognised as important koala refuges during extreme weather events like droughts and intense bushfires.

Considering their reliance on these larger patches of vegetation for both foraging and shelter, both the abundance of large trees and the relative canopy cover have been selected as parameters to gauge the quality and availability of shelter for the koala.

Specifically, the first parameter used was *tree canopy cover*. The total tree cover (incorporating both canopy and sub-canopy cover) at each site was used to inform this parameter with scores increasing with increasing tree cover. Scores were then assigned based on the score scaling presented in **Table 3.3**.

The second parameter was the *large tree abundance*, which uses field-based large tree data to score each site based on benchmark comparisons. Scores were then assigned based on the score scaling presented in **Table 3.3**.

Table 3.3: Quality and availability of shelter parameters – koala

Parameter	Parameter measurement area	Score					
		0	1	2	3	4	5
<i>Tree canopy cover*</i>	100 m transect	<10%	10-20%	20-30%	30-40%	40-50%	>50%
<i>Large tree abundance*</i>	100 m x 50 m plot	0	1.5	6-10	11-20	21-30	>=31

*See **Appendix A** for RE benchmarks

3.1.2 Site context

3.1.2.1 Threats

According to the species' Conservation Advice (DCCEEW 2022), several threatening processes have been identified for the koala. Of these, the two threats most relevant include mortality due to wild dog attacks and the abundance of ground covering weeds (particularly *Lantana camara*). Score gradings for these parameters are discussed below and outlined below in **Table 3.4**.

Mortality due to wild dogs is a known threat to koalas, with risks increasing in areas adjacent to peri-urban and residential areas. Pest presence data was collected across the offset area using methods outlined in the Baseline

Report. To calculate a species activity index for dogs, the Catling Index Value was utilised (Mitchell & Balogh 2007). This index can be used as a measure of pest animal presence/activity and is calculated using the following formula: $\text{Number of trap nights with pest records} / \text{total number of trap nights} \times 100$. The score scaling used for this attribute was informed by the baseline Catling Index Value of 2.37, with incremental improvements towards no pest observations and has been outlined in **Table 3.4**.

The presence of ground cover weeds can impede the dispersal capabilities of locally occurring koala populations (DCCEEW 2022). It was noted during the baseline surveys that ground cover weeds (particularly *Lantana camara*) were present throughout the offset properties. Whilst the abundance of lantana varied throughout the offset site, the average cover for this species across the offset property was approximately 20%. As such, the overall abundance of this weed species within the offset site was selected as a viable threat to the koala, both from impeding their local movements and from increasing fuel loads, leading to more intense bushfires. The score scaling used for this attribute was based on score scaling provided in Table 2 of the Guide, but starting with a maximum coverage of >20%. The scores for this parameter are presented in **Table 3.4**.

Table 3.4: Threats to the species – koala

Parameter	Score		
	1	7	15
<i>Wild dog presence based on Catling Species Index</i>	Catling Index Value >2.00	Catling Index Value between 1.00 and 2.00	Catling Index Value <1.00
<i>Average Lantana camara coverage across all monitoring sites</i>	>20% Lantana coverage across all sites	5% - 20% Lantana coverage across all sites	<5% Lantana coverage across all sites

3.1.2.2 Species mobility capacity

Koalas are primarily arboreal but often travel on the ground, particularly at night, when moving between foraging and sheltering habitats. These movements typically increase during the breeding season (DCCEEW 2022). The species has been recorded crossing cleared areas for hundreds of metres between trees, and dispersing over even greater distances (Youngentob *et al.* 2021). While traversing, isolated trees (including ancillary habitat trees [AHT]) and small patches of vegetation provide important refuges and stepping stones that connect larger areas of habitat (Youngentob *et al.* 2021).

During such movements, koalas prefer natural, undisturbed, and contiguous habitats. On the ground, their movement can be impeded by barriers such as fences, buildings, water bodies or other structures, as well as threats such as predation by feral or domestic animals (Beale *et al.* 2022). Dense infestations of weeds such as lantana may also impede movement. Given the abundance of lantana at the offset site this *average lantana cover* has been selected as the parameter to assess species mobility capacity for koala.

Average lantana cover is assessed by undertaking weed cover surveys in accordance with the method outlined in the OAMP. The average cover (%) is determined (all sites combined) and is scored using the score scales presented in **Table 3.5**, which were informed by Section 5.1 of the Guide (Table 2: Non-native plant cover).

Table 3.5: Species mobility capacity parameters – koala

Parameter	Score			
	1 (severely restricted)	4 (highly restricted)	7 (moderately restricted)	10 (minor restriction)
<i>Average lantana cover (across all survey sites)</i>	>50%	>25–50%	>5–25%	<5%

3.1.3 Species stocking rate

The attributes assessed for fauna-specific **SSR** are:

- Presence detected on or adjacent to site
- Species usage of the site
- Approximate density (per ha)
- Role/importance of species population on site

3.1.3.1 Presence detected on or adjacent to site

This attribute was assessed for the koala using observational data from site-specific field surveys and publicly available verified species records. The definitions of 'on site' and 'adjacent to site' are based on species-specific characteristics, particularly mobility and dispersal potential. These definitions align with the approach used to determine context scores (see **Section 2.4.3**), applying the same species-specific buffer distances. The definition of 'on-site' and 'adjacent to site' for koala are presented in **Table 3.6** below. Scoring for this attribute is consistent with the MHQA method as described in **Table 3.7**.

Table 3.6: Definitions of 'presence detected on or adjacent to site' - koala

Matter	Definition of 'on-site'	Definition of 'adjacent to site'
Koala	Record or evidence within the MNES matter area	Record or evidence within 10km of the MNES matter area

Table 3.7: Scoring for presence detected on or adjacent to site - koala

Attribute	Scoring			
	Score	0	5	10
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Criteria	No	Yes - adjacent to site	Yes – on-site

3.1.3.2 Species usage of the site (habitat type and evidenced usage)

This attribute was scored using species-specific habitat mapping within the offset area. Scoring for this attribute is consistent with the MHQA method as described in **Table 3.8**. When species habitat categorisation deviates from the standard procedure, a precautionary scoring approach is applied. For instance, if foraging and breeding habitats were combined for a matter, the highest score of 15 was assigned.

Table 3.8: Scoring for species usage of the site - koala

Attribute	Scoring				
	Score	0	5	10	15
Species usage of the site (habitat type and evidenced usage)	Description	Not habitat	Dispersal	Foraging	Breeding

3.1.3.3 Approximate density (per ha)

3.1.3.3.1 Population and density data

According to the species Conservation Advice (DCCEEW 2022), koalas are widespread across Queensland, occurring in patchy and often low-density populations across different bioregions. In many areas, koala populations are considered to be low-density, widespread, and fragmented (DCCEEW 2022). Surveys in north-western Queensland have found koalas to be patchily distributed, typically associated with creek-lines, areas of higher tree species richness, and locations where leaf moisture content is greater (DCCEEW 2022).

State-wide estimates of population size remain limited, with survey effort and available data concentrated in south-east Queensland (DCCEEW 2022). In response to this limitation and the lack of peer-reviewed estimates of koala numbers noted in earlier listing assessments, an expert elicitation exercise was undertaken in 2012 (DCCEEW 2022). The results of this exercise are now widely recognised as the most robust baseline for koala population estimates across Queensland’s bioregions and form the reference point for the current Conservation Advice. Based on this exercise, it was estimated that there were approximately 79,264 koalas in Queensland in 2012, distributed across eight bioregions. The highest population estimates were for Brigalow Belt North, Mulga Lands, and South East Queensland, with koalas also present in Central Mackay Coast, Desert Uplands, Einasleigh Uplands and Wet Tropics, Mitchell Grass Downs, and South Brigalow. These eight bioregions together cover a total area of 1,489,650 km² (148,965,000 ha), equating to a mean density of approximately 0.0005 koalas per hectare. Low-density populations are particularly characteristic of regions west of the Great Dividing Range (GDR), and this trend is even more pronounced in semi-arid environments.

3.1.3.3.2 Assessing approximate density

Given the uncertainty surrounding population and density data, a precautionary proxy parameter - *number of records per 100 ha* - has been applied to score the **approximate density (per ha)** attribute. This parameter is assessed using the total number of species records within the matter area and species-specific **context** buffer (>31,000 ha) (see **Section 2.4.3**). Including the context buffer in the assessment area reflects the species’ mobility and use of adjacent habitat. Records or verified evidence are counted over five-year periods (using the most recent five years) to align with monitoring cycles and demonstrate continued species occupancy. Under this approach, sites with higher numbers of records are precautionarily assumed to represent greater relative value to the species.

To generate a score, records per ha is calculated and then converted to records per 100 ha using the following formula:

$$\text{Records per 100 ha} = \frac{\text{Records}}{\text{Area (ha)}} \times 100$$

This parameter is then assigned a score following **Table 3.9**. Score scaling is informed by the state’s mean density of 0.05 koalas per 100 ha whereby ≥ 1 record per 100 ha will generate the low score.

Table 3.9: Approximate density scoring – koala

Parameter	Parameter measurement area	Score			
		0 (no records)	10 (low)	20 (moderate)	30 (high)
<i>Number of records per 100 ha</i>	Matter area plus context buffer described in Section 2.4.3	0	$\geq 1-2$	$\geq 3-5$	> 5

3.1.3.4 Role/importance of species population on site

This attribute was assessed for the koala using the definitions described below and the standard MHQA scoring protocols presented in **Table 3.10** and **Table 3.11**.

Key source population for breeding

The maximum score in **Table 3.10** was applied for this attribute where:

- An important population for the species is defined at the impact or offset area, and
- Habitat present is known breeding habitat.

Otherwise, a score of 0 was applied.

Key source population for dispersal

The maximum score in **Table 3.10** was applied for this attribute where:

- An important population for the koala is defined at the impact or offset area, and
- Habitat present is known dispersal habitat.

Otherwise, a score of 0 was applied.

Near the limit of the species range

This attribute was scored using spatial analysis based on DCCEE's *Species of National Environmental Significance* (SNES) distribution mapping. A species was considered near the limit of its range (and assigned the maximum score in **Table 3.10**) if the impact or offset area was located within 10 km of the SNES-defined distribution boundary, noting this data has been gridded to 1 km or 10 km, depending on species sensitivity.

Necessary for maintaining genetic diversity

The maximum score in **Table 3.10** was applied for this attribute where:

- An important population for the koala is defined at the impact or offset area, and
- There is available evidence to suggest that this population is necessary for maintaining genetic diversity.

Otherwise, a score of 0 was applied.

Table 3.10: Supplementary scoring for role/importance of fauna species population on site

Attribute		Minimum	Maximum
Key source population for breeding	Score	0	10
	Determination	No	Yes
Key source population for dispersal	Score	0	5
	Determination	No	Yes
Near the limit of the species range	Score	0	15
	Determination	No	Yes
Necessary for maintaining genetic diversity	Score	0	15
	Determination	No	Yes

Table 3.11: Final scoring for role/importance of species population on site

Attribute	Scoring				
Role/importance of species population on site	Score	0	5	10	15
	Total score	0	5-15	20-35	40-45

3.2 Cycas megacarpa

This section is largely based on the species SPRAT profile (DoE 2025) and the multi-species recovery plan for cycads (Queensland Herbarium 2007). *Cycas megacarpa* is endemic to south-east Queensland where they are found as far south as Woolooga to Bouldercombe in the north. They are a small to medium sized Cycad with an erect trunk standing around 3 m tall and approximately 15 cm in diameter. This species, as with many cycad species, contain many toxic components including glucosides cycasin and macrozamin as well neurotoxic non-protein amino acids. Very little is known about how this species is pollinated, and its seeds generally do not disperse far from the parent

plant. Seed dispersal may be aided by certain fauna species (including mammals, rodents and fruit bats), however, these seeds are toxic and relatively large.

Cycas megacarpa is found in woodland, open woodland and open forests, often in conjunction with a grassy understory (DoE 2025). They are often found in habitats dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *Corymbia erythrophloia*, *Eucalyptus melanophloia* and *Lophostemon confertus*. This species often grows on undulating to hilly terrain at altitudes ranging from 40 – 680m. They appear to have evolved to endure fires of different intensities. Mature plants are capable of survive most fires, whereas seedlings are more susceptible to intense fires.

3.2.1 Site Context

3.2.1.1 Threats to the species

According to the species’ SPRAT profile, the key threat to populations of *Cycas megacarpa* populations include habitat clearing and high intensity bushfires (DoE 2025). Upon advice from DCCEEW, broader landscape scale threats should be excluded from offset analysis, and as such the risk of bushfires has been selected as the most appropriate threat to measure for this species. As it can be difficult to quantify this risk, it was determined that this parameter would instead assessed by reviewing whether management actions have been implemented across the offset area or not. Scores simply range from No (low score of 1) to Yes (high score of 15) as outlined in **Table 3.12**.

Table 3.12: Threats to the species parameters – *Cycas megacarpa*

Parameter	Score		
	1 (high)	7 (moderate)	15 (low)
Potential for intense bushfires	Property not subject to bushfire management measures	-	Bushfire management measures have been implemented

3.2.2 Species stocking rate

The scoring attributes and maximum scores for flora-specific SSR assessments are summarised in **Table 3.13**. Although not defined in the MHQA method document, the MHQA spreadsheet template includes two additional attributes for assessing SSR for flora species, **Number of plants on site** and **Extent of population on site**. As such these have been included in the assessment method. The following sections outline how these individual attributes are scored.

Table 3.13: Flora species stocking rate attributes and maximum scores

Attribute	Score
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10
Number of plants on site	30
Extent of population on site	30
Approximate density (per ha) over suitable habitat within project area	30
Role/importance of species population on site	15

3.2.2.1 Presence detected on or adjacent to site

This attribute was assessed for *Cycas megacarpa* using site-specific field surveys and verified species record locations. Survey-specific methods for each MNES are documented in the Project’s Offset Proposal and OAMP.

The definitions of 'on site' and 'adjacent to site' are based on species-specific characteristics, especially dispersal potential. These definitions align with the approach used to determine context scores (see **Section 2.4.3**), applying the same species-specific buffer distances. The definition of 'on-site' and 'adjacent to site' for each MNES are presented in **Table 3.14** below. Scoring for this attribute is consistent with the MHQA method as described in **Table 3.15**.

Table 3.14: Definitions of 'presence detected on or adjacent to site' for flora MNES values

Matter	Definition of 'on-site'	Definition of 'adjacent to site'
<i>Cycas megacarpa</i>	Record or evidence within the MNES matter area	Record or evidence within 1km of the MNES matter area

Table 3.15: Scoring for presence detected on or adjacent to site for flora MNES values

Attribute	Scoring			
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5	10
	Criteria	No	Yes - adjacent to site	Yes – on-site

3.2.2.2 Number of plants on site

Surveys across the broader Boulder Creek Wind Farm in 2023 (EMM) identified a relatively large population of *Cycas megacarpa* separated into distinct clusters, which is typical for this species due to its limited dispersal capability (DoE 2025). In total, approximately 3,060 individuals were observed, of which approximately 73% were sub-adult and 27% were seedlings. It was also noted that almost a quarter of these individuals (22%) were deceased, with a further 4% considered in poor health. According to the conservation advice (DoE 2025) and the National Multi-species Recovery Plan (Queensland Herbarium 2007), while there are a high number of known populations of *Cycas megacarpa* (46 at the time of publication), only 7 of these contained more than 3,500 individuals. This indicates that the population recorded within the BCWF is one of the largest known populations for this species.

Whilst comprehensive cycad surveys were not undertaken throughout the entire offset area, several monitoring locations were established in conjunction with BioCondition monitoring sites. Baseline surveys undertaken at these monitoring locations identified 165 individuals, of which approximately 83% were sub-adult and 17% were seedlings. No deceased individuals were observed within these monitoring locations. As there is currently no published literature available on the recruitment for *Cycas megacarpa* (Queensland Herbarium 2007), the starting population size within the offset area was used as a basis for the score scaling of this attribute. To account for a slow population growth and to incorporate the presence of deceased (and poor health) individuals observed within the broader Project area, this baseline score was placed in the middle of the score scaling, making an allowance for the population to increase and decrease. The score scaling for this attribute has been outlined in **Table 3.16**. This attribute was calculated at the matter area scale.

Table 3.16: Number of plants recorded within the offset area

Attribute	Scoring					
Number of plants on site (based on a starting population size of 165 recorded during baseline surveys)	Score	0	10	15	20	30
	Criteria	<100 individuals	100-200 individuals	200-300 individuals	300-400 individuals	>400 individuals

3.2.2.3 Extent of population on site

The scoring for this parameter follows the standard MHQA method, however the exact GPS coordinates of *Cycas megacarpa* individuals recorded within the offset area was not collected during the baseline surveys. Subsequent

monitoring events will record this information and produce a more accurate area calculation that can be scored for the duration of the offset.

For the baseline report however, the extent of the population within the Offset area has been estimated by multiplying the number of recorded individuals (165 individuals observed) by 1 m². This surrogate for the actual extent of the offset population has been scored using the criteria presented in **Table 3.17**. It is expected that these criteria will be updated accordingly during the next monitoring event and will reflect the potential growth and/or decline of the existing population.

Table 3.17: Extent of population (ha) within the offset area

Attribute		Scoring				
Extent of population on site (ha)	Score	0	10	15	20	30
	Criteria	<0.01 ha	0.01-0.02 ha	0.02-0.03 ha	0.03-0.04 ha	>0.04 ha

3.2.2.4 Approximate density (per ha)

This was calculated for *Cycas megacarpa* using site-specific field data. An approximate density was calculated by dividing the total number of plants recorded within the offset area by the total area of potential habitat. *Cycas megacarpa* monitoring locations were established in conjunction with the BioCondition sites and consisted of a 100 x 50 m area (0.5 ha), resulting in a total of 16 sites which equates an 8 ha survey area. These density calculations were then scored at a similar scoring scale to that used for number of plants on site, as they are directly related. This score scaling has been presented in **Table 3.18**.

Table 3.18: Approximate density (per ha) over suitable habitat within the offset area

Attribute		Scoring				
Approximate density (individuals per ha)	Score	0	5	10	15	20
	Criteria	<15 individuals per ha	15-25 individuals per ha	25-35 individuals per ha	35-40 individuals per ha	>40 individuals per ha

3.2.2.5 Role/importance of species population on site

This attribute was scored for *Cycas megacarpa* using the flora SSR supplementary table (**Table 3.19**) in accordance with the MHQA method. Statutory documentation and relevant literature were reviewed to evaluate each supplementary attribute. These attributes are closely linked to the presence of important populations with scoring limited to two options: No (score = 0) or Yes/Possibly, with the latter assigned a score of 10, or 15 depending on the attribute.

Table 3.19: Flora species stocking rate supplementary table attributes and maximum scores

Attribute	Score
Key source population for germination and seed/gamete dispersal	10
Necessary for maintaining genetic diversity	15
Near the limit of the species range	15

Key source population for germination and seed/gamete dispersal

The maximum score in **Table 3.20** was applied for this attribute where:

- A population of *Cycas megacarpa* is defined at the impact or offset area, and
- It is a key source population for germination and seed/gamete dispersal.

Otherwise, a score of 0 was applied.

Necessary for maintaining genetic diversity

The maximum score in **Table 3.20** was applied for this attribute where:

- A population *Cycas megacarpa* is defined at the impact or offset area, and
- There is available evidence to suggest that this population is necessary for maintaining genetic diversity.

Otherwise, a score of 0 was applied.

Near the limit of the species range

This attribute was scored using spatial analysis based on DCCEEW's Species of National Environmental Significance (SNES) distribution mapping. A species was considered near the limit of its range (and assigned the maximum score in **Table 3.20**) if the impact or offset area was located within 5 km of the SNES-defined distribution boundary, noting this data has been gridded to 1 km or 10 km, depending on species sensitivity.

Table 3.20: Supplementary scoring for role/importance of flora species population on site

Attribute		Minimum	Maximum
Key source population for germination and seed/gamete dispersal	Score	0	10
	Determination	No	Yes
Necessary for maintaining genetic diversity	Score	0	15
	Determination	No	Yes
Near the limit of the species range	Score	0	15
	Determination	No	Yes

4. References

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Appendix A

Regional Ecosystem
and Species-Specific
Benchmarks

Table A1: Regional Ecosystem benchmarks

Attribute	11.11.1	11.11.15	11.11.4	11.11.4c	11.12.1	11.12.6	11.3.25	11.11.3
Recruitment (%)	100	100	100	100	100	100	100	100
Tree_Rich	4	4	4	5	3	4	4	3
Shrub_Rich	7	3	9	5	6	5	4	6
Grass_Rich	8	7	9	11	8	8	8	6
Forb_Rich	10	12	21	20	13	15	13	14
Tree_Height (E)	na	na	na	na	na	na	na	na
Tree_Height (T1)	16	18	21	46	15	25	23	28
Tree_Height (T2)	7	10	12	17	10	9	11	15
Tree_Cover (E)	na	na	na	na	na	na	na	na
Tree_Cover (T1)	30	35	48	26	35	44	34	45
Tree_Cover (T2)	6	5	7	13	7	15	12	6
Shrub_Cover (%)	4	3	17	1	4	4	7	9
N_Grass_Cover (%)	30	45	25	37	41	26	35	17
Litter (%)	32	23	28	39	28	44	21	50
Large Trees (Euc)	10	17	20	16	20	13	19	17
Large Trees (non)	na	na	na	na	na	na	13	na
CWD (/ha)	176	441	496	537	408	819	473	642
Non-Native_Cover (%)	0	0	0	0	0	0	0	0

Appendix B Risk Assessment

The key risks to achieving the offset area outcomes have been assessed using qualitative likelihood (**Table B.1**) and qualitative consequence ratings (**Table B.2**) with the interaction of likelihood and consequence determining the overall resultant risk. The risk assessment matrix is presented as **Table B.3**.

Table B.4 outlines the key risks to achieving the interim milestones, performance targets and completion criteria, as well as the likelihood of the identified management actions achieving the set management objectives. It outlines feasible mitigation measures to reduce the overall risk and failure of the offset.

The initial ratings assume that the risks are untreated, i.e. have not been addressed by specific risk mitigation measures other than routine design and operational practice. The residual risk resulting from corrective actions applied to each risk event is then applied.

Table B.1 Qualitative measure of likelihood

Score	Definition / Rationale
Highly Likely (L5)	Is expected to occur in most circumstances
Likely (L4)	Will probably occur during the life of the project
Possible (L3)	Might occur during the life of the project
Unlikely (L2)	Could occur but considered unlikely or doubtful
Rare (L1)	May occur in exceptional circumstances

Notes: Likelihood is defined by how likely is it that this event/circumstances will occur after management activities are implemented

Table B.2 Qualitative measure of consequence

Score	Definition / Rationale
Minor (C1)	Minor risk of failure to achieve the plan’s objectives. Minor incident of environmental damage that can be reversed. Results in short-term delays to achieving plan objectives, implementing low-cost, well-characterised corrective actions.
Moderate (C2)	Moderate risk of failure to achieve the plan’s objectives. Isolated but substantial instances of environmental damage that could be reversed with intensive efforts. Results in short-term delays to achieving plan objectives, implementing well-characterised, high-cost/effort corrective actions.
High (C3)	High risk of failure to achieve the plan’s objectives. Substantial instances of environmental damage that could be reversed with intensive efforts. Results in medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions.
Major (C4)	The plan’s objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies. Major loss of environmental amenity and real danger of continuing.
Critical (C5)	The plan’s objectives are unable to be achieved, with no evidenced mitigation strategies. Severe widespread loss of environmental amenity and irrecoverable environmental damage

Table B.3 Risk assessment matrix

		Consequence				
		Minor (C1)	Moderate (C2)	High (C3)	Major (C4)	Critical (C5)
Likelihood	Highly likely (L5)	Medium	High	High	Severe	Severe
	Likely (L4)	Low	Medium	High	High	Severe
	Possible (L3)	Low	Medium	Medium	High	Severe
	Unlikely (L2)	Low	Low	Medium	High	High
	Rare (L1)	Low	Low	Low	Medium	High

Table B.4 Risk assessment

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Offset area is not secured via legally binding mechanism	L3	C4	High	Legally secure the offset area using a Voluntary Declaration under the <i>Vegetation Management Act 1999</i> . This will remain on the title binding future owners and constrain future development.	L2	C2	Low	<p>Corrective action trigger:</p> <ul style="list-style-type: none"> the offset area has not been legally secured within 12 months of commencement of the action (i.e. 13 January 2026) 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reason why the legally binding mechanism is not secured. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Follow up progress of application with relevant department and determine reason for delay. Confirm any issues with DCCEEW, and advise timing for the mechanism to be in place. 	Implement appropriate corrective action one month prior to the date that the legal mechanism should be secured (i.e. 13 December 2025)

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Non-compliance with Offset Agreement or OAMP by landholder	L2	C4	High	<p>Offset Agreements are executed and enforced.</p> <p>Landholders have a legal requirement to comply with agreements and the OAMP.</p> <p>The legally binding mechanism will also bind the landowner to the OAMP.</p> <p>Maintain regular communication with offset landholders.</p>	L1	C2	Low	<p>Corrective action trigger:</p> <ul style="list-style-type: none"> Non-compliance with Offset Agreement and OAMP by landholder. 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reason for the non-compliance. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> BCWF to exercise its legal/contractual rights. Note in addition to a comprehensive dispute resolution framework, the Offset Agreement contains a specific process for BCWF to direct the landowner to remedy offset management issues and for BCWF to appoint a third party to remedy such issues if ultimately required. 	<p>BCWF meet with associated parties within 5 business days of becoming aware of clearing.</p> <p>Implement appropriate corrective action within 3 months of non-compliance.</p>

<p>Unapproved clearing of native vegetation within the offset area.</p>	<p>L4</p>	<p>C4</p>	<p>High</p>	<p>Offset Agreements executed and enforced. Landholders have a legal requirement to comply with agreements and the OAMP. Maintain regular communication with offset landholders.</p>	<p>L2</p>	<p>C3</p>	<p>Medium</p>	<p>Corrective action trigger:</p> <ul style="list-style-type: none"> Evidence of unapproved clearing of native vegetation within the offset area. 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate how unauthorised clearing occurred. Assess the extent of unauthorised clearing and identify appropriate corrective actions. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Meet with landholder/parties associated with clearing and discuss breach of contract and rectification measures. Installation of additional fencing and/or signage and security for the offset area. Notify relevant department/s of unapproved clearing. Additional habitat quality assessments to assess any damage and progress toward recovery to meet the next interim milestones or completion criteria. Develop Restoration Plan for the impacted/cleared area to ensure completion criteria can be achieved, including any maintenance and monitoring. DCCEEW to approve Restoration Plan prior to implementation. 	<p>BCWF meet with associated parties within 5 business days of becoming aware of clearing. Implement appropriate corrective action within 3 months of unapproved clearing.</p>
<p>Unauthorized access within the offset area.</p>	<p>L2</p>	<p>C2</p>	<p>Low</p>	<p>The offset areas will be</p>	<p>L1</p>	<p>C2</p>	<p>Low</p>	<p>Corrective action triggers:</p>	<p>Step 1: Investigate cause of trigger:</p>	<p>Implement appropriate</p>

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
				<p>appropriately fenced, with gates installed. Entry will be for the landowner, BCWF and any approved contractors.</p> <p>Fencing will minimise any livestock getting into the offset from adjacent properties.</p> <p>BCWF will ensure all contractors coming to Project site are aware of the offset areas and that it is an exclusion area unless they are permitted to carry out works in the area under this OAMP or CMTMP.</p> <p>Landholder to incidentally monitor fencelines and property to detect evidence of unauthorised access.</p>				<ul style="list-style-type: none"> • broken/tampered fences • evidence of unauthorised activities. 	<ul style="list-style-type: none"> • Investigate how and why unauthorised access occurred. • Assess the extent of impact from unauthorised access. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • If access restrictions are not successful, implementation of camera monitoring to identify perpetrators. • Notification to police and DCCEEW if suspected/substantiated unlawful access and damage to MNES. 	corrective action within 3 months of becoming aware of unauthorised access

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
<p>Grazing management not in accordance with OAMP including:</p> <ul style="list-style-type: none"> • Livestock found in exclusion areas • Livestock found in offset area in wet season. • Significant degradation of riparian areas from cattle grazing are observed. • Translocated cycads damaged by livestock. • Regenerating vegetation is being heavily browsed. • Soil degradation including significant areas of erosion and compaction soil caused by cattle. 	L5	C3	High	<p>The offset areas will be appropriately fenced, with gates installed. Fencing will minimise any livestock getting into exclusion areas.</p> <p>Landholders have a legal requirement to comply with agreements and the OAMP.</p>	L3	C3	Medium	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> • broken/tampered fences • evidence of livestock in exclusion areas • evidence of degradation by livestock. 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> • Evaluate the reason for the breach. • Evaluate damage and if any restoration is required. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • Remove livestock from exclusion areas. • Remove livestock from riparian areas • Lower stocking rate • Reduce stocking rate or prohibit grazing year-round • Rectify fencing to prevent future breaches. • Reevaluate type of fence and change fencing design if fencing isn't found to effectively exclude cattle. • Install electric fences to restrict cattle access to riparian areas. 	<ul style="list-style-type: none"> • Immediately remove livestock once observed within the exclusion area. • Lower stocking rate or remove livestock within 10 business days. • Fencing to be rectified within 30 days of damage being noted. • Electric fencing installed within 6 months of degradation being observed. • For impacts on translocated cycads, implement any corrective action on damaged cycad as determined within the CMTMP.

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Damage to native vegetation surrounding dams is evident.	L3	C2	Medium	Landholders have a legal requirement to comply with agreements and the OAMP.	L2	C2	Low	Corrective action trigger: <ul style="list-style-type: none"> • damage to native vegetation surrounding dams is observed 	Step 1: Investigate cause of trigger: <ul style="list-style-type: none"> • Evaluate the reason for the damage. • Evaluate damage and if any restoration is required. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> • Revegetate within 5m of the dam with a 1:3 replacement with tubestock of locally native species 	If required, revegetation to occur within 6 months of damaged vegetation being observed, or within the next suitable planting window, whichever is sooner.

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Increase in % cover and richness of weed species at monitoring sites from baseline and subsequent monitoring events	L4	C3	High	<p>Baseline weed survey will occur in Year 1 across offset area. The survey will document species presence and cover.</p> <p>Weed control will be undertaken annually as a minimum, by suitably qualified and experienced personnel.</p> <p>Access only by authorised personnel.</p> <p>Implement hygiene control program including vehicle washdown</p> <p>Any introduced mulch, soil or plants are to be weed free and disease free.</p> <p>Ongoing monitoring conducted for weed species and cover.</p>	L2	C2	Low	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> weed cover performance targets are not achieved new weed species identified through monitoring event. 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Investigate the reasons that may have attributed to the increase in the species richness or cover of weeds. Investigate potential sources of new weed species occurrence. Review adherence to weed control and management actions. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Amend weed hygiene requirements and provide additional education/awareness to contractors and personnel entering the site to ensure restrictions are adhered to. Increase the frequency and intensity of weed control and management activities. Third party review of weed control and management activities and identification of revised suitable methods. Ensure coordination with neighbours and community, where suitable, to ensure a consistent approach to management. 	Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Increased presence of pest animals in the offset area from baseline and subsequent monitoring events	L3	C2	Medium	<p>Baseline pest animal survey will occur in Year 1. The survey will document species presence and activity.</p> <p>Pest animal control to be undertaken in accordance with the OAMP.</p> <p>Where possible, support feral pig control in adjacent properties.</p> <p>Management must consider humane control measures</p>	L2	C2	Low	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> observed increase in incidental sightings of pigs or dogs. 10% increase in baseline activity indices. evidence of direct impact on cycads or koala from pest animals. 	<p>Step 1: Investigate cause of trigger</p> <ul style="list-style-type: none"> Investigate the reasons that may have attributed to the increase in the score AI for the relevant pest animals Review adherence to pest animal control and management actions. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Increase the frequency and intensity of pest animal control and management activities Third party review of pest animal control and management activities and identification of revised suitable methods. Ensure coordination with neighbours and community, where suitable, to ensure a consistent approach to management. 	Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.

<p>Inappropriate fire regime, increased fire risk or unplanned fire event occurs</p>	<p>L4</p>	<p>C4</p>	<p>High</p>	<p>Fire management and monitoring activities will be undertaken on an annual basis as outlined in the OAMP. This will include establishment and maintenance of fire breaks and fuel load reduction.</p> <p>Prescribed burns will be used to manage fuel loads (in combination with light grazing in some areas) and promote diversity in MNES habitats.</p> <p>Fire prescriptions will consider the vegetation community type, maturity and ecological requirements of the regenerating areas.</p> <p>Appropriate burn times including cool burns to influence a variety of ecological responses that do not favour any one species.</p> <p>Biomass control will be undertaken to reduce likelihood</p>	<p>L3</p>	<p>C2</p>	<p>Medium</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> • fuel loads are higher than what is typical for the relevant ecosystem as determined by the suitable qualified bushfire consultant within annual bushfire reporting • access tracks are overgrown • unmaintained fire breaks • occurrence of an uncontrolled fire (i.e. any fire that is not deliberately lit as part of the prescribed fire regime and/or one that is unable to be contained despite firefighting efforts). 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> • Investigate the reasons why fuel loads have exceeded thresholds or unplanned fire has occurred. • Review adherence to fire management protocols and activities. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • Increase the frequency of biomass monitoring. • Alter timing and frequency of selective grazing. • Increase the frequency of weed control measures. • Review the effectiveness of firebreaks and if required establish additional fire breaks and/or widen existing firebreaks. • Inspect and maintain fire breaks more regularly, including prior to the peak fire season each year (August – December). • Implement fuel load reduction actions that are most appropriate for the area and conditions. • Review the timing, frequency and intensity of fuel hazard reduction burns for the particular offset value and vegetation communities. • Should unplanned fire occur, undertake an assessment of the 	<p>Implement appropriate corrective actions within 2 months of becoming aware of corrective action triggers.</p>
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Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
				of hot bushfires occurring.					impacted area (within 2 months of the fire event) <ul style="list-style-type: none"> Evaluate impact of unplanned fire on achieving offset area outcomes and develop bushfire recovery program if deemed necessary Third party review of fire management protocols and activities, to advise on amendments or additional measures required. 	
Insufficient funds provided by approval holder to implement the OAMP.	L3	C4	High	Committed actions in this OAMP will be fully costed each financial year. BCWF will set aside those funds to deliver required actions. BCWF will engage appropriate contractors to implement management actions and monitoring over set periods of time and pay associated invoices based on delivery of work.	L1	C2	Low	Corrective action triggers: <ul style="list-style-type: none"> Change in proponent. Budget exceeded. 	Step 1: Investigate cause of trigger <ul style="list-style-type: none"> Investigate the reasons why budget has been exceeded. Step 2: Corrective actions will be applied, such as: <ul style="list-style-type: none"> Ensure any new proponent is aware of offset requirements and associated costs. Review management activities / contractor procurement processes if annual budgets are exceeded. Review appropriateness of offset management budgets / funding. 	Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.

<p>Offset area outcomes are not achieved in required timeframes.</p>	<p>L4</p>	<p>C3</p>	<p>High</p>	<p>Implementation of the OAMP to achieve offset area outcomes will include reducing grazing pressure, reducing weed cover, reducing pest animal activity, actively managing fire risk and reducing fuel loads.</p>	<p>L2</p>	<p>C2</p>	<p>Low</p>	<p>Corrective action triggers:</p> <ul style="list-style-type: none"> • Interim milestone not achieved • Performance target not achieved • Completion criteria not achieved 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> • Investigate reasons why the performance targets, interim milestones or completion criteria were not achieved within the specified timeframes. • Re-evaluate the suitability of the relevant management measures in the OAMP and identify appropriate corrective actions. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> • Third party review of OAMP efficacy and revise management actions such as: <ul style="list-style-type: none"> – Replace fencing structures to ensure management of stock according to the designated management zones. – Increase weed control. – Rectify erosion issues. – Place tree guards around young regenerating saplings to reduce browsing by native herbivores. – Modify fire management strategy – Increase fuel load management and monitoring frequency. – Conduct ripping, direct seeding and supplementary planting of tubestock in the regenerating areas. 	<p>Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.</p>
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Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
									<ul style="list-style-type: none"> • Increase monitoring frequency to every 2 years to gauge effectiveness of corrective actions. • If it is considered that the completion criteria cannot be achieved BCWF will notify DCCEEW and, if required, provide alternative offset areas to acquit the required offset requirements 	

Risk	Initial Risk			Management Actions	Residual Risk			Corrective Action Trigger	Corrective Actions	Timing of Corrective Action
	L	C	RL		L	C	RL			
Stochastic events (wildfire/drought/flood) prejudice attainment of completion criteria.	L3	C5	Severe	<p>Fire management planning will ensure fuel loads are managed and monitored.</p> <p>Fuel load reduction will be through grazing, manual reduction or cool burns.</p> <p>Weed and pest animal management will be adaptive and adjusted based on monitoring results.</p>	L3	C3	Medium	<p>Corrective action trigger:</p> <ul style="list-style-type: none"> Unplanned fire, drought or flood impacts offset within years 15 to 20. 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Re-evaluate the suitability of the relevant management measures in the OAMP and identify appropriate corrective actions. <p>Step 2: Corrective actions will be applied, such as:</p> <ul style="list-style-type: none"> Undertake risk assessment to determine the impact of the stochastic event on the achievement of offset area outcomes within the remaining timeframes Revise OAMP management and monitoring actions and frequencies Extend the life of the offset to beyond 20 years If it is considered that the completion criteria cannot be achieved BCWF will notify DCCEEW and, if required, provide alternative offset areas to acquit the required offset requirements 	Implement appropriate corrective actions within 3 months of becoming aware of corrective action triggers.

Appendix C EPBC Act Offset Principles

The EPBC Act Environmental Offsets Policy (2012) sets out eight principles for offset suitability. The Stage 1 BCOA has been assessed against these principles in the table below.

EPBC Environmental Offset Policy Principle	How it is Met
<p>Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter</p>	<p>The offset package will directly contribute to the ongoing viability of the MNES required to be offset through the protection of habitat on title from future loss, improvement in habitat quality and connectivity, increase the availability of foraging and breeding habitat for koalas, and result in a reduction of threatening processes for koalas and <i>Cycas megacarpa</i>.</p> <p>The proposed management actions will deliver conservation outcomes for each target MNES to achieve completion criteria at Year 20.</p> <p>The offset area is known to support both MNES species. Baseline habitat quality assessments have been completed in Year 1 (2025). Habitat quality assessments will be undertaken at five-yearly intervals until the completion criteria are achieved.</p> <p>Without the offset being put in place key threatening processes would prevail including landholder’s rights for vegetation clearing in non-remnant areas, weeds would increase and predation and impacts from pest animals. Lantana for example is a fire accelerant (increase risk of hot bushfires) and can create a barrier for koalas to travel between trees and increase predation by wild dogs</p> <p>This OAMP and associated management actions will support regeneration and restoration of Koala and <i>Cycas megacarpa</i> habitat. Habitat quality gains, including performance targets are proposed.</p> <p>As per the EPBC Offsets Policy the DCCEEW Offsets Assessment Guide for relevant MNES has been applied including showing habitat quality score gains. Calculators are provided in Appendix E.</p>
<p>Suitable offsets must be built around direct offsets but may include other compensatory measures</p>	<p>The offset package is comprised of 100% land-based offsets for each MNES. EPBC Offset Calculators provided in Appendix E demonstrates the Stage 1 BCOA meets and exceeds offset requirements.</p>
<p>Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter</p>	<p>Anticipated offset requirements have been calculated using the Offsets Assessment Guide.</p> <p>The Guide considers the listing status of each MNES and their probability of annual extinction. The use of these measurements in the Guide ensures that the appropriate level of statutory protection is applied. Koala was assessed as ‘vulnerable’ under the calculator as this was its listing at the time the Project was determined a controlled action by DCCEEW.</p> <p>All threats to MNES outlined in the Conservation Advices have been considered and those relevant to the Project and offset area are addressed in this OAMP. The Stage 1 BCOA meets offset requirements for both Koala and <i>Cycas megacarpa</i> under the EPBC Offset Policy requirements resulting in large areas of habitat being improved in habitat quality, legally secured in perpetuity from future loss, and delivering conservation outcomes for the impacted MNES.</p>

EPBC Environmental Offset Policy Principle	How it is Met
<p>Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter</p>	<p>This OAMP provides for land-based offsets for the Stage 1 clearing of koalas and <i>Cycas megacarpa</i> habitat.</p> <p>Offset requirements have been built around compensating for the maximum Stage 1 clearing limits. Anticipated offset requirements have been calculated using habitat quality scoring and the Offset Assessment Guide (OAG), which considers the conservation status of the protected matter, area of impact to habitat, risk of loss with and without the offset, time it will take to yield a conservation gain and risk of gain not being realised.</p> <p>The proposed offset presents habitat commensurate in type (like for like) within the impact area. The total offset required has been determined using the maximum SRI, application of the OAG, and habitat quality scoring which includes both site specific data from impact area and offset area.</p> <p>The size and scale of the proposed offset is appropriate and will deliver conservation gains for each MNES. The size and scale of land-based offsets are also sustainable as they are directly connected to other large tracts of remnant vegetation and biodiversity corridors as described in the OAMP.</p>
<p>Suitable offsets must effectively account for and manage the risks of the offset not succeeding</p>	<p>Confidence in the success of the offset is high because these rely on controllable management actions including a) prevention of future clearing; b) removal of livestock from <i>Cycas megacarpa</i> translocation areas for seven years and regrowth areas during the summer until completion criteria are met; c) weed control; d) pest control and e) managing natural regeneration.</p> <p>Potential risks have been carefully considered and are considered manageable and based on management actions proposed and regular monitoring can be adequately managed to ensure the offset succeeds. The risk assessment identifies how risks will be avoided and minimised, or if they do occur what are corrective actions to be implemented.</p> <p>Offsets need to be adaptive to ensure different scenarios are catered for, and that learnings are built on until completion criteria are met (Year 20). This is where a robust monitoring program will assist to pick up any risks or issues early, and to ensure they are acted on to ensure the offset succeeds. Monitoring events are clearly defined.</p> <p>The level of confidence that habitat quality gains will be achieved is assessed at 80%. Koalas and <i>Cycas megacarpa</i> are based on a one and two point increases over 20 years. This is justified on the basis of:</p> <ul style="list-style-type: none"> • Weed control and pest animal control will be undertaken by suitably experienced and licenced contractors. • Active weed control through well used and recommended techniques are known to be effective in reducing fuel loads, reducing non-native weed cover which will then result in increased levels of recruitment and increased native ground cover. • Reducing feral pig populations will also have a positive impact on <i>Cycas megacarpa</i> populations and their recruitment and growth. Feral pig control is known to be effective and based on annual control efforts will reduce populations on site. • Resource effort can be increased for weed and pest control if required to ensure gains are achieved. • Through grazing controls to be put in place in regeneration areas this will increase recruitment and growth of eucalypt species. Over time it will also increase canopy cover, canopy height and species richness. Landholders will be regularly

EPBC Environmental Offset Policy Principle	How it is Met
	<p>reviewing groundcover levels and stocking rates to ensure the offset values are being maintained and improved. Corrective actions are also specified to ensure the outcomes are being met.</p> <ul style="list-style-type: none"> • Fuel load management and fire management is known to be effective in reducing the risk of hot wildfires occurring and maintaining appropriate ground cover levels. • Through actively managing natural regeneration, and if required supplementary plantings, this will result in an increase in koala habitat foraging resources, increased canopy tree height and cover. There are many koala restoration projects which have successfully demonstrated koalas are using these areas after 10 years from planting. <p>Habitat quality gains are further outlined in Section 5 and management actions to achieve those gains summarised in Section 7. A proportion of the offset is cleared and degraded land from historic land uses. There are large gains to be achieved here through increased abundance of eucalypt trees, increase in canopy height and canopy cover, increase in recruitment, improved native ground cover and reduction of non-native cover. These areas will provide additional habitat for koalas and improved connectivity. The level of confidence that this can occur is high as natural regeneration will be managed and monitored. If regeneration rates are too low supplementary plantings will be put in and actively managed. These types of restoration projects for koalas have been done successfully many times over.</p> <p>Other management actions proposed are proven as effective such as weed control and pest animal control. This work will be done by suitably experienced and licenced contractors from the local region.</p> <p>The high confidence of the offset succeeding is also supported by the offset site selection, design of management actions, and comprehensive monitoring and reporting procedures.</p> <p>The OAMP has been developed to be adaptive and utilise results of monitoring to help inform where corrective actions and changes might be needed. This is to ensure habitat quality gains stay on track to achieve both interim performance criteria and final performance outcomes. This approach further mitigates the risk of the offset not succeeding.</p> <p>Based on the one and two point increases proposed for both MNES the above actions and associated outcomes are considered likely to be achieved with a high degree of confidence.</p>
<p>Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs</p>	<p>Legally securing the offset sites in perpetuity will ensure existing and future owners are prohibited from conflicting land uses, including clearing and grazing. Offset landowners must comply with the OAMP. Clearing native vegetation within the offset can only occur for those prescribed items in the OAMP. If the offset was not in place the landowners could clear regrowth in non-remnant areas and prevent any future regeneration occurring. Grazing and agricultural land uses would also continue in their current form or with potential for intensification.</p> <p>Management beyond minimum legislative requirements is proposed across the whole area to ensure loss of habitat values does not occur through intensification of weeds causing degradation of habitat and loss of connectivity, destruction of habitat via hot intensive fires and increased risk of mortality or injury by predators. Landowners don't need to legally manage</p>

EPBC Environmental Offset Policy Principle	How it is Met
	<p>all weeds that are present on the offset and are not carrying out weed management to the intensity it is required to allow more natural regeneration to occur and to reduce impediment to koala movement and cycad growth.</p> <p>Achieving conservation gain for each MNES requires management actions that go beyond standard land management requirements and will provide benefit more generally to terrestrial ecology values in the region.</p> <p>One of the largest additional actions is removal of livestock from regrowth areas during summer to enable natural regeneration of these cleared areas creating additional koala habitat. This would not occur if the offset was not put in place.</p>
<p>Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable</p>	<p>Efficient and Effective:</p> <p>The offset area is strategically located adjacent to existing large tracts of remnant vegetation and biodiversity corridors. The clearing of koala habitat is a relatively small proportion (i.e. 3.5% of Project Area) of the overall habitat and the offset will increase habitat availability and patch size in the non-remnant areas. Large areas of known and potential habitat will be retained in the Project area, including riparian vegetation, maintaining connectivity with the site and broader region.</p> <p>Management actions will ensure efficient delivery of outcomes over the offset area and proactive management, monitoring and reporting will ensure response/corrective actions are timely and focused.</p> <p>Timely:</p> <p>Remnant vegetation will deliver habitat quality gains quite quickly due to being established habitat and significant improvements can be made in first five years such as reduction in non-native cover. Koala habitat regeneration areas will also make good gains in the first 5 to 10 years increasing number of foraging trees available, increased canopy height and cover, improved connectivity. Many revegetation projects showing koalas using these planted trees within first 10 years.</p> <p>To increase habitat attributes such as large trees this are expected to take years.</p> <p>Reduction in pest animal populations can be achieved quite quickly and within the first five to 10 years substantial gains can be made in reducing their numbers.</p> <p>It is anticipated that the full habitat quality gains will be achieved within 20 years.</p> <p>The offset will be legally secured within 12 months of commencement of the action.</p> <p>Corrective actions will be implemented in a timely manner when required.</p> <p>Transparent:</p> <p>The OAMP has a number of measures to maintain transparency including an annual compliance report. This report will be submitted to DCCEEW and include details of offset management actions completed, any corrective actions implemented, and how offset is progressing.</p> <p>Every five years a monitoring report will be prepared and made and submitted to DCCEEW. This monitoring report will include all monitoring results, compare previous monitoring rounds, and assess whether the offset has achieved the interim performance criteria for that stage.</p> <p>A final report at end of 20 years will also be published demonstrating attainment of completion criteria.</p>

EPBC Environmental Offset Policy Principle	How it is Met
	<p>Scientifically robust:</p> <p>The Stage 1 BCOA was assessed by qualified and experienced Ecologists, including with experience in management of koalas and <i>Cycas megacarpa</i>. Ongoing management and monitoring actions will be undertaken by land managers under the guidance of an offset manager ((qualified ecologists and regeneration specialists) to achieve the outcomes specified within the EPBC Act approval and this OAMP.</p> <p>Suitably qualified contractors will undertake management actions such as weed control, fire management and pest animal control.</p> <p>The baseline surveys completed have been undertaken by suitably qualified and experienced ecologists, using agreed survey methods and guidelines endorsed by DCCEEW.</p>
<p>Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced</p>	<p>This OAMP establishes clear guidance regarding the ongoing management and monitoring requirements to improve or maintain the viability of the protected matters.</p> <p>The OAMP provides a transparent and detailed methodology to deriving habitat quality scores for each MNES.</p> <p>A comprehensive monitoring program has been developed which is set out in the OAMP which will allow for the progress of the offset to be tracked, but also provide important information on the presence, abundance and distribution of MNES in the offset.</p> <p>Auditing arrangements and clear identification of persons responsible for delivery actions have been identified.</p>

Appendix D Suitably Qualified Ecologists

Jeromy Claridge

Principal Environmental Scientist



Profile

Jeromy has an extensive background in environmental impact assessment and management. He has 30 years of experience providing environmental advice through all project development phases from preliminary planning and site/route selection through to project feasibility and transaction support, environmental assessment and approvals and on-site environmental management.

Jeromy is a Certified Environmental Practitioner and has comprehensive knowledge and understanding of environmental legislation at the Commonwealth, state and local government levels. Jeromy has managed complex multidisciplinary environmental assessments, undertaken extensive consultation with government agencies at all levels, and facilitated community engagement for a range of projects.

Qualifications & Certifications

Master of Environmental Management, 2007

University of Queensland

Bachelor of Science (Hons Botany), 1996

University of Queensland

Certified Environmental Practitioner (CEnvP), 2006 to present

Career Summary

Attexo Group 2020-present

EMM Consulting 2017-2019

Amec Foster Wheeler / Wood (formerly Unidel) 2009-2017

Scott Wilson 2008-2009

AECOM / Maunsell 2004-2008

Parsons Brinckerhoff 2002-2004

**Queensland Department of Primary Industries /
Department of Environment and Resource
Management** 1995-2001

Partner and Principal Environmental Scientist

Associate Director, Environment

Associate Director, Environment

Australian Planning and Environment Manager

Principal Environmental Scientist

Senior Environmental Scientist

Scientist

Key Project Experience

- Callide Wind Farm Preliminary Documentation, Iberdrola. EPBC approvals advice, review of Preliminary Documentation, approach to offsets and *Cycas megacarpa* translocation, Protected Plant Clearing permit and construction environmental management.
- Herries Range Wind Farm, Acciona. Ecological constraints mapping, EPBC approvals strategy, protected plant surveys, Bird and Bat Utilisation Surveys, and *Macrozamia conferta* translocation strategy.
- MacIntyre Wind Farm EIS, Acciona. EPBC 2020/8756 approvals, development and implementation of MNES Management Plan, Offset Area Management Plan (for MNES values; Koala, Grey-headed Flying-fox, Greater Glider, Squatter Pigeon and Regent Honeyeater), *Macrozamia conferta* Translocation Management Plan, UQ Research Plan, Protected Plant Clearing Permits, review of Bird and Bat Management Plan.
- Aldoga Solar Farm Preliminary Documentation, Acciona (EPBC 2020/877). Review of Offset Area Management Plan (for Koala, Squatter Pigeon, and Greater Glider), *Cycas megacarpa* Translocation Plan, MNES Management Plan, High-risk Species Management Plan, Pre-clearance Survey Methodology.
- Boudier Creek Wind Farm, Green Investment Group (Macquarie) EPBC 2020/8772. Post EPBC approval advice, review of *Cycas megacarpa* Translocation Management Plan and Offset Management Plans.
- Lotus Creek Wind Farm, Ark. Review of *Cycas megacarpa* Translocation Management Plan and Protected Plant Clearing Permit application.
- Dulacca Wind Farm (EPBC 2018/8368), Environmental Management Plans, pre-construction environmental monitoring and reporting
- Carmichael Rail, EPBC 2010/5736 MNES Management Plan implementation during construction 2017 to 2021; including Squatter Pigeon offsets and species impact management
- West Mount Cotton Quarry Expansion, Karreman Quarries EPBC 2018/8340 approval, development and implementation of OAMP (from 2022 and ongoing) for Koala, Greater Glider and Grey-headed Flying-fox.
- Pikedale Wind Farm, CWP. Ecological constraints planning and approvals strategy.
- Harrami Wind Farm, Mainstream Renewable Power. Ecological constraints planning.
- Gayndah Wind Farm, Mainstream Renewable Power. Ecological constraints planning.
- Dulacca Wind Farm, MPC Kinetic. Secondary environmental approvals and associated management plans; weed and pest, pre-clearance surveys, ESCPs and environmental inspections.
- Surat Basin Rail EIS; Project Manager, Surat Basin Rail Pty Ltd – 210km greenfield railway in central Queensland with a CAPEX of ~\$1.5b.
- Inland Rail Project, ARTC – environmental approvals strategy for geotechnical studies for Queensland portion of the alignment, coordination of protected plant and ecological studies for ~1,500 sites
- Woolgoolga to Ballina Pacific Highway Upgrade Project Species Management Plans, Roads and Maritime Services – Project Director
- Moranbah and Nebo Gas-fired Power Stations EIS, Transfield Services – Project Manager
- Australia Pacific LNG Project, Origin Energy – post-EIS Approvals and Studies including: environmental work packs under the Collaborative Well Delivery Services model, including design for ~250 wells; Export Pipeline Detailed Environmental Infield Studies; Exploration and Appraisal environmental management and fauna spotter catcher coordination; gasfield ecology and pre-clearance surveys for ~50 properties; gasfield aquatic values management plans, Soil Assessment Management Plans, biodiversity offsets for gasfield and export pipeline.
- New Acland Mine, New Hope Coal – Progressive Rehabilitation Certification, Protected Plant Permit application
- Bauxite Hills Mine Project EIS, Metro Mining – terrestrial and aquatic ecology studies

Appendix E EPBC Act Offset Calculators

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
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	360	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	180.01	Adjusted hectares	
<i>Threatened species</i>						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
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		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		
								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)	
Area of habitat	Yes	180.01	Adjusted hectares		Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1279.3	Risk of loss (%) without offset	3%	Risk of loss (%) with offset	0%	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	
								Future area without offset (adjusted hectares)	1240.9	Future area with offset (adjusted hectares)	1279.3										
								Time until ecological benefit	20	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)									5
<i>Threatened species habitat</i>																					
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
Number of features e.g. Nest hollows, habitat trees	No																				
Condition of habitat Change in habitat condition, but no change in extent	No																				
<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	180.005	211.42	117.45%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Cycas megacarpa
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

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	136.1	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	68.05	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
<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)	Start quality (scale of 0-10)	Risk of loss (%) without offset	Future area without offset (adjusted hectares)	0.0	Risk of loss (%) with offset	Future area with offset (adjusted hectares)	0.0								
						Time until ecological benefit			Future quality without offset (scale of 0-10)			Future quality with offset (scale of 0-10)										
Area of habitat	Yes	68.05	Adjusted hectares		20	Time over which loss is averted (max. 20 years)	Start area (hectares)	606.1	Risk of loss (%) without offset	Future area without offset (adjusted hectares)	587.9	Risk of loss (%) with offset	Future area with offset (adjusted hectares)	606.1	18.18	80%	14.55	11.46	82.12	120.68%	Yes	
									Time until ecological benefit			Future quality without offset (scale of 0-10)										Future quality with offset (scale of 0-10)
									20			Start quality (scale of 0-10)										6
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
Number of features e.g. Nest hollows, habitat trees	No																					
Condition of habitat Change in habitat condition, but no change in extent	No																					
<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	68.05	82.12	120.68%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Appendix F Offset Calculator Justifications

Koala offset calculator

Attribute	Justification
Quality of impact area	<p>The habitat quality of the impact site is 5 out of 10.</p> <p>Habitat quality assessments were conducted across the impact area in accordance with the Guide to Determining Terrestrial Habitat Quality Version 1.2.</p>
Quality of offset area	<p>The starting habitat quality of the offset area is 5 out of 10.</p> <p>Habitat quality assessments were conducted across the offset areas in accordance with BCOA Modified Habitat Quality Assessment Methods.</p>
Future quality without offset	<p>This is the habitat quality of the offset area if the offset was not to be put in place including active management as set out in this OAMP not occurring, and threatening processes continuing.</p> <p>Due to existing land management practices across the offset areas including cattle grazing, horses and clearing in non-remnant areas to maintain pasture, as well as likely increase in weed cover, threats from hot bushfires and unmanaged pest animals it is predicted that the offset condition would stay at a 5 out of 10.</p> <p>Key impacts to habitat quality include:</p> <ul style="list-style-type: none"> • Grazing contributes to reductions in native grass and forb species richness, ground cover, litter cover and coarse woody debris • disturbance of soil and riparian areas, spread of weeds and feeding on native plants by Feral Pigs • reduction in recruitment of native trees due to grazing and land clearing.
Future quality with offset	<p>For Koala, the HQ score is estimated to increase by two points to 7 out of 10 within 20 years due to the implementation of management measures and change to land management as outlined in the OAMP.</p> <p>Key management actions will include:</p> <ul style="list-style-type: none"> • increasing native species canopy cover, particularly in non-remnant areas • increase in tree height and species diversity to improve foraging habitat for Koalas • protection of regrowth areas and assistance in natural regeneration to facilitate connectivity to other areas of habitat and increase quantity of Koala food trees • reducing non-native weed cover particularly with a focus on lantana due to its ability to restrict Koala movement • control of grazing pressure which will in turn increase native species richness, recruitment and native ground cover • fuel load reduction and bushfire management.
Confidence in result – future quality (%)	<p>Confidence in result is a percentage figure that describes the level of certainty about the success of the proposed offset. Offset actions that are designed to have a lower risk of failure will have a higher confidence in result score.</p> <p>Based on the prescribed management actions, and lower starting condition of some areas, there is a high confidence the habitat quality gains will be achieved for Koalas and Koala habitat. Areas of non-remnant vegetation have potential for large improvements in the quantity of Koala food trees, canopy height and cover, reduction in non-native vegetation and increase in ground cover and woody debris.</p> <p>The level of confidence that habitat quality gains will be achieved is assessed at 80%. To achieve a one point increase in habitat quality over 20 years is reasonable and achievable through the management actions proposed. Management actions proposed are proven as effective and performance outcomes for Koalas would be achievable in the timeframe provided for. Also, regular monitoring will occur to ensure effectiveness of management actions, and corrective actions applied to keep the offset on track.</p> <p>The specified management actions such as weed management, management of grazing including exclusion of grazing in some areas, managing natural regeneration and bushfire management will see the one point increase occur at the end of 20 years.</p>

Attribute	Justification
Risk of loss without offset (%)	<p>Risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be permanently lost in the foreseeable future. Risk of loss accounts for any clearing of a site which might not be regulated under Commonwealth, state or territory environmental law.</p> <p>The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with advice provided in 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (TSRH 2017), the risk of loss for Rockhampton Regional Council local government area (LGA) is 13.79%. The offset is situated in this LGA.</p> <p>It is acknowledged the offset properties are situated on the western boundary of the LGA in a rural zone which isn't under as great threat from future development such as urban pressures. The offset area does however include 35% of non-remnant areas which can be legally cleared of any regrowth or regenerating vegetation. There are also permitted agricultural land uses on the offset property including cattle grazing and horses, clearing for fence lines, tracks and farm infrastructure that can occur in both remnant and non-remnant areas which are contributors to loss of habitat condition and function for Koalas.</p> <p>Based on review of Table 3 in the risk of loss guideline it is acknowledged the offset areas do contain MNES values, but that some clearing and development would not trigger an offset requirement. This is because landholders can continue to clear and develop for agricultural purposes non-remnant and regrowth habitat under lawful exemptions and would not refer these actions for their impact on Koala.</p> <p>It is considered the Koala offset areas are subject to an overall risk of loss of 3%.</p>
Risk of loss with offset (%)	<p>This has been set at 0%.</p> <p>The offset area will be legally secured on title using a voluntary declaration under <i>Vegetation Management Act 1999</i>. This will be binding on the title therefore existing and future landowners must retain the offset area in perpetuity. The offset vegetation cannot be cleared, and management of the land must be in accordance with the OAMP.</p> <p>If a development was proposed to occur it would require an offset.</p>
Confidence in result – risk of loss (%)	<p>This relates to confidence that the risk of loss will be averted by putting the offset in place. Based on the legally binding mechanism being in place and active management occurring to protect and enhance habitat values, an 80% confidence has been assigned.</p>
Time over which loss is averted (years)	<p>This is the time over which changes in the level of risk can be considered and is equivalent to the time over which the offset area is proposed to be actively managed. A timeframe of 20 years has been applied as this is the length of time over which active management of the property will be in place to achieve the performance outcomes and final HQ score for Koalas. It is also consistent with the offset assessment guide.</p> <p>The offset will be legally secured in perpetuity.</p>
Time until ecological benefit (years)	<p>This is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. Twenty years has been allowed for the habitat quality of the remnant, non-remnant and regenerating regrowth Koala habitat to improve two points given the implementation of the management measures outlined in Section 5.</p> <p>The first five years will see significant gains in the non-remnant portions of the offset from natural regeneration of Koala food trees, and reduction in weed cover across the entire offset area also improving Koala connectivity. Within 20 years there will be significant improvement in Koala food tree species diversity, tree height and canopy cover, reduced weed cover and reduced threats from hot bushfire and pest animals.</p>
% of impact offset	117%
Impact area	360.01 ha
Offset area	1,279.3 ha

Cycas megacarpa offset calculator

Attribute	Justification
Quality of impact area	The habitat quality of the impact site is 5 out of 10. Habitat quality assessments were conducted across the impact area in accordance with the Guide to Determining Terrestrial Habitat Quality Version 1.3 (referred to as the Habitat Quality Guide) (DES 2020).
Quality of offset area	The starting habitat quality of the offset area is 6 out of 10. Habitat quality assessments were conducted across the offset areas in accordance with BCOA Modified Habitat Quality Assessment Methods.
Future quality without offset	This is the habitat quality of the offset area if the offset was not to be put in place, active management does not occur, and threatening processes continue. Land management practices across the offset areas include livestock grazing and clearing in non-remnant areas to maintain pasture. Over time these activities combined with a likely increase in weed cover and soil degradation, will cause a decline in habitat quality. Additionally, high fuel loads increase potential for a hot bushfire to occur which would impact on <i>Cycas megacarpa</i> populations. Without the offset a general decline in habitat quality is likely to occur in attributes such as species richness, canopy cover, recruitment of native canopy species and non-native plant cover. It is predicted that future habitat quality for the species would reduce one point to a 5 out of 10.
Future quality with offset	For <i>Cycas megacarpa</i> , the HQ score of habitat is estimated to increase by one point to 7 out of 10 within 20 years due to the implementation of management measures. Key management actions are likely to include: <ul style="list-style-type: none"> • improving native species canopy cover, particularly in non-remnant areas • increase in tree height • protection of regrowth areas and assistance in natural regeneration to facilitate connectivity to other areas of habitat • increase in recruitment and populations of <i>Cycas megacarpa</i> • reducing non-native weed cover particularly with a focus on lantana due to its ability to prevent growth of <i>Cycas megacarpa</i> • control of grazing pressure to prevent damage to <i>Cycas megacarpa</i> • reduction in feral pig populations to reduce predation on seed and impact to plants • fuel load reduction and bushfire management.
Confidence in result – future quality (%)	Confidence in result is a percentage figure that describes the level of certainty about the success of the proposed offset. Offset actions that are designed to have a lower risk of failure will have a higher confidence in result score. Based on the prescribed management actions, and starting baseline score of 6 out of 10, there is a high confidence the habitat quality gains will be achieved for <i>Cycas megacarpa</i> and their habitat. Gains will be achieved through a reduction in weed cover to enhance the ability for <i>Cycas megacarpa</i> to grow and regenerate. Feral pig control will reduce predation on cycad seeds and increase success of regeneration and increase in population numbers. Fuel loads will be managed and monitored to prevent hot bushfires occurring. The level of confidence that habitat quality gains will be achieved is assessed at 80%. To achieve a one point increase in habitat quality over 20 years is reasonable and achievable through the management actions proposed. Management actions proposed are proven as effective and performance outcomes for <i>Cycas megacarpa</i> would be achievable in the timeframe provided for. Also, regular monitoring will occur to ensure effectiveness of management actions, and corrective actions applied to keep the offset on track. The specified management actions such as weed management, management of grazing including exclusion of grazing in areas such as <i>Cycas</i> recipient sites, bushfire management and feral pig control will see the one point increase occur at the end of 20 years.
Risk of loss without offset (%)	Risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be permanently lost in the foreseeable future. Risk of loss accounts for any clearing of a site which might not be regulated under Commonwealth, state or territory environmental law. The difference between the risk of loss with and without an offset is the level of averted loss provided by the proposed offset. In accordance with advice provided in 'Guidance for deriving

Attribute	Justification
	<p>'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (TSRH 2017), the risk of loss for Rockhampton Regional Council local government area (LGA) is 13.79%. The offset is situated in this LGA.</p> <p>It is acknowledged the offset properties are situated on the western boundary of the LGA in a rural zone which isn't under as great threat from future development such as urban pressures. The offset area includes areas of regrowth and cleared land that can be legally cleared of any existing native vegetation including regenerating vegetation. There are also permitted agricultural land uses on the offset property including cattle grazing and horses, clearing for fencelines, tracks and farm infrastructure that can occur in both remnant and non-remnant areas which are contributors to loss of habitat condition and function for <i>Cycas megacarpa</i>.</p> <p>Based on review of Table 3 in the risk of loss guideline it is acknowledged the offset areas do contain MNES values, but that some clearing and development would not trigger an offset requirement. This is because landholders can continue to clear and develop for agricultural purposes non-remnant and regrowth habitat under lawful exemptions and would not refer these actions for their impact on <i>Cycas megacarpa</i>. Individual cycads are also under some risk of loss from general land management such as track maintenance, livestock tramping juveniles and extensive weed cover that can outcompete them.</p> <p>It is considered the <i>Cycas megacarpa</i> and their habitats are subject to an overall risk of loss of 3%.</p>
Risk of loss with offset (%)	<p>This has been set at 0%.</p> <p>The offset area will be legally secured on title using a voluntary declaration under <i>Vegetation Management Act 1999</i>. This will be binding on the title therefore existing and future landowners must retain the offset area in perpetuity. The offset vegetation cannot be cleared, and management of the land must be in accordance with the OAMP.</p>
Confidence in result – risk of loss (%)	<p>This relates to confidence that the risk of loss will be averted by putting the offset in place. Based on the legally binding mechanism being in place and active management occurring to protect and enhance habitat values, an 80% confidence has been assigned.</p>
Time over which loss is averted (years)	<p>This is the time over which changes in the level of risk can be considered and is equivalent to the time over which the offset area is proposed to be actively managed. A timeframe of 20 years has been applied as this is the length of time over which active management of the property will be in place to achieve the performance outcomes and final HQ score for <i>Cycas megacarpa</i>. It is also consistent with the offset assessment guide.</p> <p>The offset will be legally secured in perpetuity.</p>
Time until ecological benefit (years)	<p>This is equivalent to the estimated time it will take for the habitat quality to improve and the offset to be realised. Twenty years has been allowed for the habitat quality to improve two points given the implementation of the management measures outlined in Section 5.</p> <p>The first five years will see significant gains in a reduction of weed cover, reduction in feral pig populations across the offset area and reduced risk from hot bushfires. Within 20 years there will be significant improvement in tree species diversity, tree height and canopy cover, reduced weed cover and increased population numbers and dispersal of <i>Cycas megacarpa</i>.</p>
% of impact offset	121%
Impact area	136.08 ha
Offset area	606.1 ha

Appendix G Consistency with Conservation Advice

Summary of threatened species management objectives

Key Threats	Management Outcome	Management Action/s to Address Key Threats
Koala		
<p>The relevant conservation advice and recovery plans considered are listed below:</p> <ul style="list-style-type: none"> • <i>Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory. (DAWE 2022a).</i> • <i>National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE 2022b).</i> 		
Habitat loss, fragmentation and/or degradation	<ul style="list-style-type: none"> • Overall improvement in Koala habitat quality. • Increase in Koala habitat extent through natural regeneration. • Increased Koala habitat connectivity. 	<p>Habitat loss and fragmentation are identified as a key threat to the koala as identified in the conservation advice for the Koala.</p> <p>A total of 1,206 ha of existing and future Koala habitat will be protected and managed within the Stage 1 BCOA (consistent with Action 3a in the National Recovery Plan for the Koala). Existing grazing practices will be reduced and managed across the site, allowing natural regeneration to occur.</p> <p>Weed control works and fuel/biomass control will be implemented across the 898 ha of remnant woodland, resulting in a net improvement in condition through reduction of weeds and control of biomass and ongoing growth and recruitment of Koala feed trees and resting trees.</p> <p>Weed control works and fuel/biomass control will also be implemented across the 308 ha of regrowth woodland and natural regeneration management areas, resulting in continued regeneration of these areas and a net increase in availability of koala habitat. Natural regeneration management areas will be managed by prohibiting clearing, reducing weed cover and mitigating high intensity bushfires, to increase the quality of koala and <i>Cycas megacarpa</i> habitat within this area. (Consistent with Action 5c in the National Recovery Plan for the Koala)</p> <p>These measures, combined, address a key threat of habitat loss and will have a positive impact on the local and regional population of the koala.</p>
Predation by wild dogs	<ul style="list-style-type: none"> • Reduced likelihood of predation by wild dogs. 	<p>Predation, particularly by wild dogs, is identified as a threat to the Koala and may lead to localised declines (DSEWPC 2012b, TSSC 2012, DAWE 2020a) as identified in the Conservation Advice for the Koala. Whilst much of the available data is from urban and peri-urban environments wild dogs will prey on Koalas in rural and regional settings and may lead to significant local declines, particularly when coupled with other impacts.</p> <p>Predator control works, focusing on wild dogs will be undertaken across the Stage 1 BCOA in areas of known wild dog populations, and movement corridors using a variety of methods including trapping and shooting (refer to the controls listed in the Queensland Government Biosecurity Act 2014). Ensuring high or increasing populations of predators are reduced, particularly wild dogs, will reduce overall population pressure, providing positive benefits for the local Koala population.</p>
Climate change and drought	<ul style="list-style-type: none"> • Enhancing drought-resistant habitat. 	<p>Drought and incidences of extreme heat are identified as a threat to the Koala in the Conservation Advice and may cause significant mortality in the populations (TSSC 2012). Seabrook et al. (2012) identified that drought significantly reduced populations in south-east Queensland and Koalas contracted to critical riparian habitats.</p> <p>The offset area will enhance drought-resistance and connectivity to known drought refugia habitat, such as riparian vegetation. By maintaining and enhancing the quality of these refugia areas will in turn increase the resilience of koala populations across the area.</p>
Mortality and injury from wildfires	<ul style="list-style-type: none"> • Reduce frequency and intensity of fires 	<p>Climate change and resultant increased risk of fire is identified as an increasing threat to the Koala, resulting in mortality and range reductions (TSSC 2012). The recent 2019/2020 bushfire season have resulted in significant losses of Koala habitat and the</p>

Key Threats	Management Outcome	Management Action/s to Address Key Threats
	<p>within Koala habitat.</p> <ul style="list-style-type: none"> Increased survival of extreme fire events. 	<p>Koala is identified as needing urgent, emergency action to address an increased risk of extinction. This event demonstrates that capacity of increased fire risk to impact this species.</p> <p>Weed and fuel/biomass control will be undertaken across the Stage 1 BCOA to reduce fuel loads and risk of high intensity to catastrophic fires, by utilising targeted grazing and implementing controlled burns/hazard reduction burns. Further, these measures are designed to ensure they do not have negative impact on other habitat features such as regeneration or on <i>Cycas megacarpa</i> individuals.</p> <p>Firebreaks will be maintained within and adjacent to the offset area to also protect the area from wildfires.</p> <p>These measures will provide an increased level of protection for the Koala within the Stage 1 BCOA, reducing the risk of both mortality and habitat loss because of fire. This will provide benefits for local populations as well the regional population through ensuring an available population source should fires have detrimental impact on regional populations.</p>
Mortality and injury from vehicle strikes	<ul style="list-style-type: none"> Reduce risk of vehicle collision as Koalas move through habitat across vehicle tracks 	<p>Risk of mortality has been identified in the Conservation Advice for the Koala as a threat to the species. Signage will be placed along vehicular tracks and speed limits no higher than 60 km/h will be enforced to reduce the risk of vehicle strike in locations of observed Koala sightings within the Stage 1 BCOA.</p>
<i>Cycas megacarpa</i>		
<p>The recovery plans considered is listed below:</p> <ul style="list-style-type: none"> <i>National Multi-species Recovery Plan for the cycads, Cycas megacarpa, Cycas ophiolitica, Macrozamia cranei, Macrozamia lomandroides, Macrozamia pauli-guilielmi and Macrozamia platyrhachis (Queensland Herbarium 2007).</i> 		
Land clearing and habitat degradation (also loss of genetic variation)	<ul style="list-style-type: none"> Overall improvement in <i>Cycas</i> habitat quality. Increase in <i>Cycas</i> habitat extent through natural regeneration. 	<p>Destruction of individuals and habitat from land clearing activities is considered the greatest threat to the species as identified in the National Recovery Plan as referenced above.</p> <p>A total of 606.1 ha of existing <i>Cycas megacarpa</i> habitat has been delineated as the <i>Cycas megacarpa</i> offset area and will be protected and managed as part of the Stage 1 BCOA. No clearing activities are permitted within the Stage 1 BCOA.</p> <p>The Stage 1 BCOA contains two discrete cycad recipient areas that will contain translocated cycads salvaged from the impact works and propagated seedlings. These recipient areas will provide habitat for cycads and increase connectivity and genetic diversity for the population.</p> <p>Weed control works and fuel/biomass control will be implemented across the 395 ha of remnant woodland, resulting in a net improvement in condition through reduction of weeds and control of biomass and ongoing growth and recruitment of <i>Cycas megacarpa</i> individuals.</p> <p>Weed control works and fuel/biomass control will be implemented across the regrowth woodland and natural regeneration management areas, resulting in continued regeneration of these areas and a net increase in availability of <i>Cycas megacarpa</i> habitat.</p>
Predation by pests such as feral pigs or insects	<ul style="list-style-type: none"> Reduction in cycad predation 	<p>Feral pig populations will be managed on site where necessary by the measures described in the OAMP.</p> <p>Management of predation within cycad recipient areas is described within the Boulder Creek Windfarm CMTMP. Management includes monitoring translocated cycads and implementing corrective actions where significant predation is observed, including from insects. These corrective actions will potentially include treatment with relevant insecticides, growth stimulants and where necessary the potential quarantining of the plant (i.e. temporarily relocate the plant away from the other plants).</p>
Destruction of cone, seed bank and seedlings from hot wildfires	<ul style="list-style-type: none"> Reduce instance of hot wildfire 	<p>Land management practices including fire, have been identified as a threat to the species in the National Recovery Plan. Weed and fuel/biomass control will be undertaken across the Stage 1 BCOA to reduce fuel loads and risk of high intensity to catastrophic fires.</p>

Key Threats	Management Outcome	Management Action/s to Address Key Threats
		<p>Regular fuel load monitoring will also be carried out and controlled burns undertaken where appropriate to reduce fuel loads. Grazing in some areas will also assist to maintain fuel loads at the right stocking rate to ensure habitat condition does not deteriorate.</p> <p>Firebreaks will also be created around the entire Stage 1 BCOA as well as the cycad recipient areas to protect the area from hot wildfires.</p>
<p>Illegal harvesting</p>	<ul style="list-style-type: none"> • Reduce instance of trespassing and illegal harvesting 	<p>Illegal harvesting has been identified as a threat to the species in the National Recovery Plan. Measures will be taken to minimise trespassing into the Stage 1 BCOA, and any illegal harvesting of seeds or plants. This will include locked gates and cameras if evidence of illegal harvesting is observed within the Stage 1 BCOA.</p>