



Anglo American Moranbah North Mine Extension (EPBC 2018/8338)

Offset Area Management Plan

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A	25 September 2022	Internal draft	TK	
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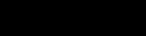
DECLARATION OF ACCURACY

I declare that:

- 1. To the best of my knowledge, all the information contained in, or accompanying this Moranbah North Mine Extension - Offset Area Management Plan (Revision) is complete, current and correct.
- 2. I am the designated proponent or the approval holder for this action.
- 3. I am aware that:
 - a. Section 490 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.
 - b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) where the person knows the information or document is false or misleading.
 - c. The above offences are punishable on conviction by imprisonment, a fine or both.



 Signed



 Full name (please print)

Anglo American Steelmaking Coal

 Organisation (please print)

Date 24/06/24

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1. Introduction

This Offset Area Management Plan (**OAMP**) describes how Anglo American proposes to secure and manage biodiversity offsets for the Moranbah North Mine Extension (**the Project**) as part of the approval (EPBC 2018/8338) issued under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* on 18 September 2020 (and varied on 28 February 2022).

This OAMP describes how significant residual impacts to Matters of National Environmental Significance (**MNES**) will be offset consistent with the *EPBC Act Environmental Offsets Policy*.

The OAMP utilises the agreed ecological mapping and condition of the impacted site and the findings of the ecological assessments undertaken at the proposed offset areas to outline how the offset obligations under the approval are addressed.

1.1. Responsible Party

The proponent for the Project is Anglo Coal (Moranbah North Management) Pty Ltd a wholly owned subsidiary of Anglo American Steelmaking Coal Pty Ltd (**AASMC**). AASMC is, in turn, a wholly owned subsidiary of Anglo American plc, which is one of the largest diversified mining companies in the world with operations in Africa, Asia, the Americas, Europe and Australia. In Australia, Anglo American's focus is on producing highest-quality hard coking coal for steel production with five metallurgical coal operations in Central Queensland and also joint venture interests in metallurgical coal and manganese. Anglo American are the third largest seaborne exporter of metallurgical coal in the world and the largest underground coal miner in Australia.

Anglo Coal (Moranbah North Management) Pty Ltd, its successors and assigns, commits to the implementation of this OAMP.

1.2. The Project

The Moranbah North Mine is an underground metallurgical coal mine, located near Moranbah in the Bowen Basin of Central Queensland (Figure 1). The Project is located on Mining Lease 70042 and is shown in Figure 2.

1.3. Purpose and objectives of this management plan

The purpose of this OAMP is to address the requirements of the varied EPBC Act approval dated 28 February 2022 relating to MNES offset requirements and offset delivery. This OAMP addresses the offset requirements for both Stage 1 and Stage 2 of the project. The requirements from the varied approval and a reference to the relevant section of this OAMP are provided in *Table 1*.

The environmental outcomes of this OAMP are specific improvements in ecological values in habitat for each of the matters impacted by the Project. These improvements are defined in detail in Section 5 of this document (including offset completion criteria and performance targets).

Table 1: Offset requirements of the EPBC Act Approval

Condition ¹	OAMP section																								
1. The approval holder must undertake the action in the Moranbah North Extension project area.																									
2. The approval holder must not clear more habitat for each listed threatened species than the area specified for each listed threatened species in the 'Total Clearance of habitat (hectares)' column of the following table:																									
<table border="1"> <thead> <tr> <th>MNES</th> <th>Stage 1</th> <th>Stage 2</th> <th>Total Clearance of habitat (hectares)</th> </tr> </thead> <tbody> <tr> <td>Koala</td> <td>300</td> <td>230</td> <td>530</td> </tr> <tr> <td>Greater glider</td> <td>300</td> <td>230</td> <td>530</td> </tr> <tr> <td>Squatter pigeon breeding habitat</td> <td>124</td> <td>141</td> <td>265</td> </tr> <tr> <td>Squatter pigeon foraging habitat</td> <td>182</td> <td>88</td> <td>270</td> </tr> <tr> <td>Ornamental snake</td> <td>10</td> <td>31</td> <td>41</td> </tr> </tbody> </table>	MNES	Stage 1	Stage 2	Total Clearance of habitat (hectares)	Koala	300	230	530	Greater glider	300	230	530	Squatter pigeon breeding habitat	124	141	265	Squatter pigeon foraging habitat	182	88	270	Ornamental snake	10	31	41	
MNES	Stage 1	Stage 2	Total Clearance of habitat (hectares)																						
Koala	300	230	530																						
Greater glider	300	230	530																						
Squatter pigeon breeding habitat	124	141	265																						
Squatter pigeon foraging habitat	182	88	270																						
Ornamental snake	10	31	41																						
3. To compensate for the total clearance of habitat for the listed threatened species up to the limits as specified in condition 2, the approval holder must provide an environmental offset in accordance with the principles of the Environmental Offsets Policy.	<i>Refer to Section 1.4 and Section 3.</i>																								
4. To compensate for the total clearance of 530 ha of Greater Glider (<i>Petauroides volans</i>) habitat, the environmental offset must result in an increase in Greater Glider (<i>Petauroides volans</i>) habitat connectivity in the riparian zones within the environmental offset	<i>Refer to Section 3 and 4. The offset area selected contains riparian zones and associated vegetation.</i>																								
5. By 30 September 2022, the approval holder must submit an Offset Area Management Plan (OAMP) prepared by a suitably qualified ecologist and suitably qualified person for the written approval of the Minister. The approval holder must not commence Stage 2 until the OAMP has been approved in writing by the Minister. The approved OAMP must be implemented for at least the remaining duration of this approval.	This document fulfils the requirements of the OAMP, which has been prepared by a suitably qualified ecologist and a suitably qualified person.																								
6. The OAMP must include:	<i>Outlined in Section 4 and Section 5</i>																								
a) a description of the environmental offset that will compensate for the total clearance of the listed threatened species habitat as specified in condition 2, including the location, size, condition, environmental values present and surrounding land uses;																									
b) baseline data, including results from field validation surveys, and quantifiable ecological data on habitat quality and other supporting evidence that documents the presence of each listed threatened species, and the quality of habitat for each listed threatened species within the environmental offset;	<i>Attachment A and B – Ecological reports for the offset site</i>																								
c) an assessment of site habitat quality;	<i>Attachment C – Habitat quality scoring sheets based on the ecological reports for the offset site</i>																								
d) details of how the environmental offset will provide connectivity with other habitats and biodiversity corridors or will contribute to a larger strategic offset for each listed threatened species;	<i>Outlined in Section 3 and Figures 2 and 3</i>																								
e) maps and shapefiles to clearly define the location and boundaries of the environmental offset, accompanied by the offset attributes;	<i>Figures 4 – 7 illustrate the offset areas and vegetation types within the properties;</i>																								

¹ Approval Moranbah North Extension Project (EPBC 2018/8338) approval as varied on 28 February 2022

Condition ¹	OAMP section
	<i>further detail is provided in the attached ecology reports</i>
f) specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat for each listed threatened species in the environmental offset over the remaining period of effect of this approval;	<i>Outlined in Section 5</i>
g) details of the management actions, and timeframes for implementation, to be undertaken to achieve the offset completion criteria, including but not limited to: (i) removal and exclusion of stock from grazing in the riparian zones where establishment work of tree species native to the Bowen Basin region is being undertaken; (ii) control of grazing in the riparian zones where there are established trees; (iii) establishment of a typical range of tree species native to the Bowen Basin region, in particular local Eucalyptus species in riparian zones and elsewhere in the environmental offset; (iv) measures to protect juvenile trees from grazing by native species; and (v) weed and feral animal management;	<i>Outlined in Section 7, Table 10</i>
h) interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria;	<i>Outlined in Section 5</i>
i) 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 all necessary corrective actions);	<i>Outlined in Section 9</i>
j) timing for the submission of internal monitoring reports which provide evidence demonstrating whether the interim milestones and offset completion criteria are likely to be, and/or have been, achieved;	<i>Outlined in Section 9</i>
k) timing for the implementation of corrective actions if monitoring activities indicate the interim milestones will not be, or have not been, achieved;	<i>Refer to Sections 7 and 9</i>
l) 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 a rating of all initial and post-mitigation residual risks in accordance with the risk assessment matrix;	<i>Refer to Section 6</i>
m) evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans; and	<i>Outlined in Section 2.2</i>
n) details of the legal mechanism for legally securing the environmental offset, such that legal security remains in force over the environmental offset for at least the period of effect of this approval.	<i>Outlined in Section 10</i>
7. To assess the effectiveness of the management actions in the approved OAMP to increase Greater Glider (<i>Petauroides volans</i>) habitat connectivity in	<i>Outlined in Sections 5 and 9</i>

Condition ¹	OAMP section
the riparian zones within the environmental offset, the approval holder must engage an independent suitably qualified expert to undertake an assessment every 5 years after the approval of the OAMP until the offset criteria are achieved.	
8. The approval holder must ensure each assessment of the effectiveness of the management actions in the approved OAMP is: <ul style="list-style-type: none"> a) subject to a peer-review completed within 6 months of the completion each such assessment; and b) published on its website with the findings of the peer-review within 6 months of the completion of the peer-review and remain published for the remaining duration of this approval. 	<i>Outlined in Section 9</i>
9. The approval holder must legally secure the environmental offset within 1 year from the date that the OAMP is approved in writing by the Minister. The approved OAMP must be attached to the legal mechanism used to legally secure the environmental offset.	<i>Outlined in Section 10.</i>
10. The approval holder must notify the Department within 5 business days of the mechanism to legally secure the environmental offset having been executed.	<i>Outlined in Section 10.</i>

1.4. MNES within the Project area

The Project is located in central Queensland within the Brigalow Belt Bioregion North. A range of EPBC Act listed threatened species and threatened ecological communities (TECs) are known to occur across the bioregion and potentially within the Project area, mainly in areas of remnant vegetation.

Field studies and vegetation mapping was undertaken in the project area during the assessment and approval of the Project, this identified four (4) MNES as present. The MNES impacted and the area of both impact and required offset are detailed in Table 2.

For the offset area the overlapping habitats of particular species have been co-located and the larger area allocated as the offset. Accordingly, offset areas for Koala, Greater glider and Squatter pigeon are grouped together while the offset for Ornamental snake is separate.

Table 2: MNES significant residual impacts and offset areas

Protected matter and Habitat Definition (approval conditions)	Impact area (ha)*	Habitat quality score	Offset area (ha)*	Habitat quality start score	Habitat quality completion score	% impact offset
<i>Phascolarctos cinereus</i> (Koala) Forest or woodland containing species that are Koala food trees.	530	■	■	■	■	■
<i>Petauroides volans</i> (Greater glider) All areas of Eucalypt forests or woodlands that contain hollow-bearing trees	530	■	■	■	■	■
<i>Geophaps scripta scripta</i> (Squatter pigeon - southern) Grassy woodlands dominated by <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Acacia</i> or <i>Callitris</i> within 1 km of a waterbody.	265	■	■	■	■	■
Grassy woodlands dominated by <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Acacia</i> or <i>Callitris</i> species within 3 km of a waterbody.	270					

Protected matter and Habitat Definition (approval conditions)	Impact area (ha)*	Habitat quality score	Offset area (ha)*	Habitat quality start score	Habitat quality completion score	% impact offset
<i>Denisonia maculate</i> (Ornamental snake) Gilgai mounds and depressions with cracking-clay soils and moist areas (particularly within, or close to habitat that is known to be favoured by its prey (frogs))	41	■	■	■	■	■

*Noting the total area is not the sum of the combined areas as there are overlapping habitats.

^All areas qualify as breeding habitat as they are within 1 km of permanent waterbodies.

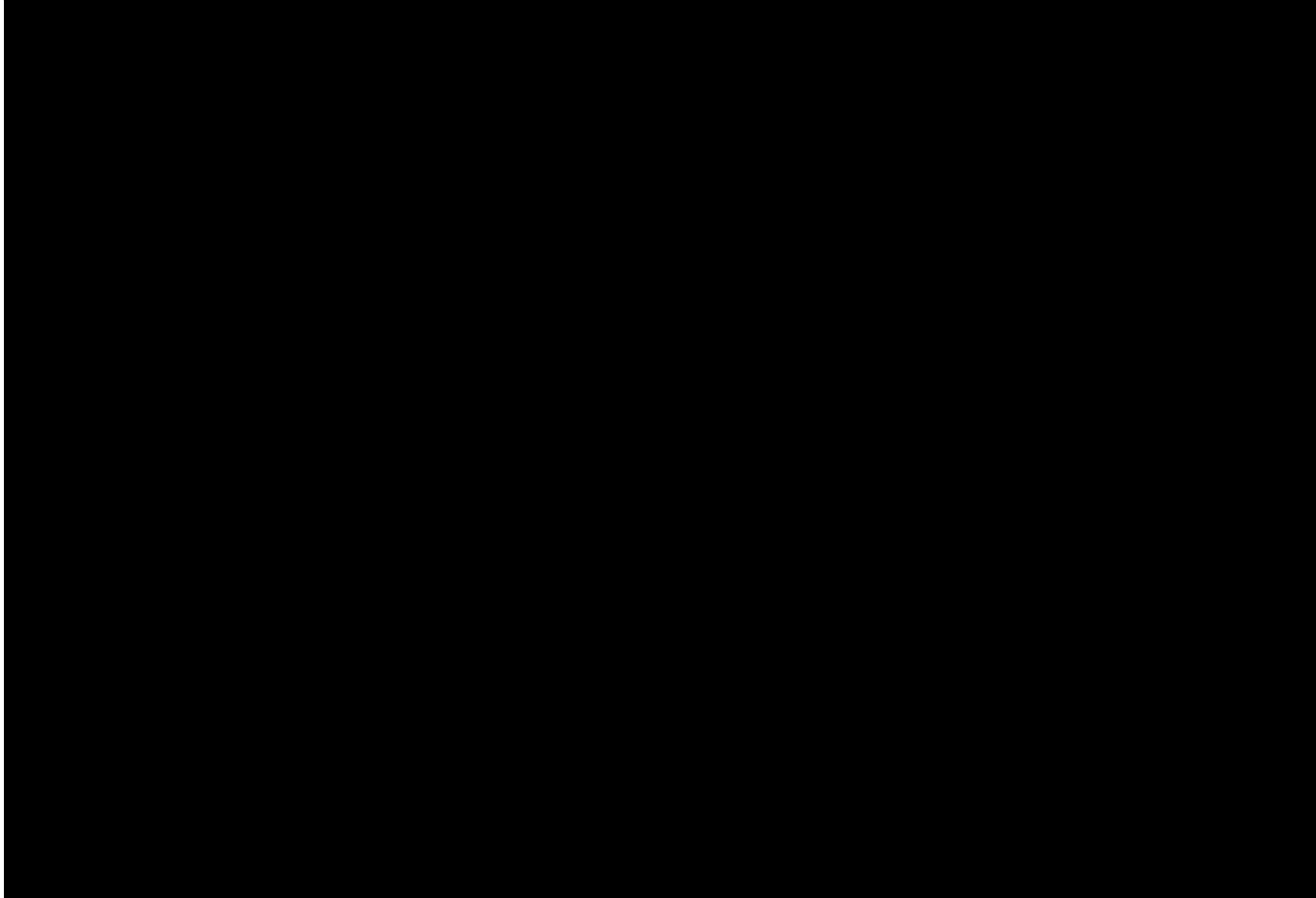
1.5. Area for offset acquittal

To fulfil the requirements of the EU two properties have been selected to acquit the offset requirements.

1. [REDACTED] km north-east of the Project area.
2. [REDACTED] km east of the Project area.

The locations of the two properties are shown in Figure 1. The [REDACTED] will provide the offset for Koala, Greater glider and Squatter pigeon, while [REDACTED] provides the offset for Ornamental snake. The selected properties are considered suitable to provide the values required to address the approval requirements.

Figure 1: Location Moranbah North Mine and Offset Areas



2. EPBC Act Environmental Offsets Policy and framework

This section describes how the proposed offset meets the relevant requirements of the EPBC Act Environmental Offsets Policy (October 2012), plans and guidelines.

2.1. Policy principles

The EPBC Act Environmental Offsets Policy sets out eight key overarching principles to determine the suitability of offsets. Table 3 outlines each of the policy principles and how it has been considered in the OAMP, with a reference to the relevant OAMP section.

Table 3: EPBC Act Environmental Offset Policy principles

Policy principle	Project offsets
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters.	The offset will deliver a conservation outcome by providing habitat areas for the following species: koala, greater glider, squatter pigeon and ornamental snake. The habitat will be managed to improve the habitat values for those species, and a Voluntary Declaration (VDec) under the <i>Vegetation Management Act 1999</i> (QLD) (VMA) will ensure legal protection of the offset area.
Suitable offsets must be built around direct offsets but may include other compensatory measures.	100% of the Project's MNES offset obligations will be acquitted by the proposed direct land-based offsets.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	The status of the impacted threatened species has been taken into account through the use of offset assessment guide that was used to calculate the offset area requirements.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.	The extent of the offset has been calculated using ecological reports that include both flora and fauna surveys, for both the impact and offset sites to inform inputs into the offset assessment guide (OAG).
Suitable offsets must effectively account for and manage the risks of the offset not succeeding.	The risks associated with the offset have been assessed (<i>Section 6</i>) and mitigation and appropriate management actions proposed in the Offset Area Management Measures provided in <i>Section 7</i> . In addition, uncertainty, and therefore risk, associated with averted loss and net gain in habitat quality were addressed by applying the offset assessment guide.
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.	Vegetation clearing as a Native Forest Practice, or a Forest Practice; and grazing on the offset site; is not currently prohibited by legal mechanisms at either the local, state or Australian government legislative level. The areas are zoned rural and have been used for timber harvesting and cattle grazing previously. Areas of the offset properties have been subject to vegetation clearing since the late 1970s. The current regulated vegetation will be secured via a VDec that has its head of power under the VMA.
Suitable offsets must be efficient, timely, transparent, scientifically robust and reasonable	The proposed offsets will be efficient and timely as the offset will be established and implementation commenced as soon as this OAMP is approved. The scale and suitability of the offset are transparent, and the offsets are based on the terrestrial ecology reports prepared by suitably qualified ecologists. The proposed areas have been determined using the EPBC Act OAG inputs and calculators.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	The offset sites were surveyed between 2020-2022, providing the baseline habitat quality assessment and these scores compared against the relevant bio-condition benchmarks for attributes relevant to the protected matters. Habitat quality assessments were conducted in accordance with the <i>Guide to Determining Terrestrial Habitat Quality Version 1.8, 2020</i> . These habitat assessment measurements will be repeated periodically in accordance with this plan during its implementation phase. Monitoring and reporting are detailed in <i>Section 9</i> . The offset will be protected from clearing and secured via a VDec that has its head of power under the VMA.

2.2. Addressing relevant EPBC plans and advice

The EPBC Act Environmental Offsets Policy states that an offset should address key priority actions for the impacted MNES in any approved recovery plans, threat abatement plans, conservation advice, ecological character description or approved Commonwealth Management Plan. Table 4 summarises how this plan addresses the relevant Conservation Advices and Threat Abatement Plans.

Table 4: Conservation Advice and Threat Abatement Plans addressed in the OAMP

Document	Key threats	Comment/Relevant Section in document
<p>Approved Conservation Advice for <i>Phascolarctos cinereus</i> (Koala), Canberra: Department of the Environment, 2012.</p> <p><i>NB. At the time the approval was signed the Koala was listed as Vulnerable under the EPBC Act. Subsequently the Koala has been re-listed as Endangered and the Conservation advice updated.</i></p> <p><i>While the Endangered status of the Koala is not legally relevant the updated conservation advice and Recovery Plan has been taken into account in developing this plan.</i></p>	<p>Vegetation clearing for cropping and pasture and grazing Land clearing was a significant cause of mortality to koalas, particularly in the Brigalow Belt Bioregion (Cogger et al. 2003). Habitat fragmentation may also impede post-drought recovery of koala populations.</p> <p>Vehicle strike Dogs and cars are threats to koalas that are closely associated with urban expansion, with exposure to both increasing as land adjacent to koala habitat is developed and occupied. However, while these threats are most intense in the urban and peri-urban environment, they may be threats in rural areas (Crowther et al. 2010; Senate Environment and Communications References Committee 2011).</p> <p>Disease The most well-known disease present in koala populations until recently is associated with chlamydia (Natural Resource Management Ministerial Council 2010). Many koalas carry chlamydia, but do not always show clinical symptoms (known as chlamydiosis). There is circumstantial evidence that chlamydiosis might increase in response to environmental stresses such as overcrowding and poor nutrition (Melzer et al. 2000 and references therein), although the epidemiology of chlamydiosis is not well understood. Koala Retrovirus (KoRV) was recently identified and is thought to be responsible for a range of conditions, including leukaemia (Tarlinton et al. 2005) and an immunodeficiency syndrome. Up to 100% of koalas in Queensland and NSW have KoRV. There is some evidence that chlamydiosis may be exacerbated by KoRV (Tarlinton et al. 2005). Koala Retrovirus has endogenised in koalas (Tarlinton et al. 2006) in Queensland and New South Wales. That is, it has infected germ line cells (spermatozoa or oocytes) and is transmitted genetically (by inheritance) from</p>	<p>Refer to <i>Section 7</i>: Forestry and native vegetation - clearing is not permitted under the plan. No forestry or timber harvesting activities will be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset area is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.</p> <p><i>Section 7</i>: Access to the offset area will be restricted. Illegal access is not allowed and access will be managed by the landowner. <i>Section 9</i>: Monthly inspections will identify if fences are operational and preventing cattle and unauthorised people from accessing the offset area. The offset areas are on large privately owned agricultural properties in a remote area with access to the area restricted to the land managers. The offset areas are contained on the back portions of the properties and there are no public access points to the offset areas. There is no known treatment for disease that is prevalent in the populations naturally. The establishment of the offset area, increasing the extent and condition of the habitat, may act to reduce some of the environmental stresses that are thought to accentuate the diseases.</p>

Document	Key threats	Comment/Relevant Section in document
	<p>parents to offspring. Although this is a known mechanism of transmission, KoRV may also spread from koala to koala (horizontal spread) by close contact, and from infected mothers to their joeys via the milk, in a manner similar to the way that many other retroviruses spread (Hanger 1999). Whether KoRV can be transmitted by biting insects has yet to be determined.</p> <p>Predation by dogs Dogs and cats are threats to koalas that are closely associated with urban expansion, with exposure to both increasing as land adjacent to koala habitat is developed and occupied. However, while these threats are most intense in the urban and peri-urban environment, both may also be threats in rural areas (Crowther et al. 2010; Senate Environment and Communications References Committee 2011).</p>	
<p>Approved Conservation Advice for <i>Petauroides Volans (Greater Glider)</i>, Canberra: Department of the Environment, 2016.</p> <p><i>NB. At the time the approval was signed the greater glider was listed as Vulnerable under the EPBC Act. Subsequently the greater glider has been re-listed as Endangered and the Conservation advice updated.</i></p> <p><i>While the Endangered status of the Greater glider is not legally relevant the updated conservation advice has been taken into</i></p>	<p>Habitat loss (through clearing, clearfell logging and the destruction of senescent trees due to prescribed burning) and fragmentation. The species is absent from cleared areas and has little dispersal ability to move between fragments through cleared areas; low reproductive output and susceptibility to disturbance ensures low viability in small remnants.</p> <p>Too intense or frequent fires Population loss or declines documented in and after high intensity fires (Lindenmayer et al., 2013). Studies show that hot, unplanned fires are a main threat to greater glider habitat through increased mortality due to overheating and loss of hollows.</p> <p>Timber production Prime habitat coincides largely with areas suitable for logging; the species is highly dependent on forest connectivity and large mature trees. Glider populations could be maintained post-logging if 40% of the original tree basal area is left (Kavanagh 2000). There is a progressive decline in numbers of hollow-bearing trees in production forests as logging rotations become shorter and as dead stags collapse (Ross 1999; Ball et al., 1999;</p>	<p><i>Section 7:</i> Feral animals – will be monitored and controlled. The plan will minimise the presence of feral animals and control of existing populations of feral animals (feral cats, dogs and pigs) within the offset areas in accordance with the <i>Biosecurity Act 2014</i> (Qld). Upon being notified or becoming aware of the presence of large numbers of feral animals in the offset area, the Landholder is to implement feral animal control measures within one month. <i>Section 9:</i> Monthly inspections will be conducted by the landholder to record the presence of wallow holes, tracks and visual incidents in the offset area.</p> <p><i>Section 7:</i> Forestry and native vegetation - clearing is not allowed under the management plan. No forestry or timber harvesting activities are to be conducted during the period of the declared area. Forestry and native timber harvesting practices in the offset area remove large trees that provide shelter and food and may also contain hollows and deadwood. It is therefore considered a potential threat to the quality of the habitat.</p> <p><i>Section 7:</i> Fire is not permitted in the offset area unless for fuel reduction purposes, at no less than seven-year intervals and no more than 30% of the area at any one time (as per Queensland Department of Environment and Science (DES) regional ecosystem descriptions fire management guidelines). Fuel reduction burns will be used as a last resort, and if utilised will be planned to be cool burns of low intensity with no canopy scorch, with the aim to reduce fuel load in the ground cover layer. This practice aims to prevent unplanned high intensity burns that result from a build-up of fuel.</p> <p><i>Section 7:</i> Forestry and native vegetation - clearing is not permitted by the plan. No forestry or timber harvesting activities are to occur during the period of the declared area. Forestry and native timber harvesting practices in the offset area remove large trees that provide shelter and food and may also contain hollows and deadwood. It is therefore considered a potential threat to the quality of the vegetation community and habitat.</p>

Document	Key threats	Comment/Relevant Section in document
<i>account in developing this plan.</i>	<p>Climate change Biophysical modelling indicates a severe range contraction for the northern subspecies (Kearney et al., 2010). Occupancy modelling indicates that the degree of site occupancy is associated with vegetation lushness and terrain wetness (Lumsden et al., 2013). Water stress affects growth in forest eucalypts (Matusick at al., 2013) and the availability of browse, and higher temperatures may cause heat stress and mortality (Vic SAC 2015).</p>	<p>For the contribution to biodiversity corridors and connectivity – Refer to <i>Section 3.2</i>. At a property level climate change is best addressed through the building or resilience within natural ecosystems. A key element of this is protecting and managing larger areas of good condition native vegetation and habitat as intended under this OAMP. The offset site was selected for its potential to provide a substantial increase to the habitat, connectivity and other ecological values within the surrounding area. The area is currently composed of degraded tracts of regulated vegetation associated with Sixteen Mile Creek and its tributaries. Protecting these Eucalypt forests from native timber harvesting and fire will add significant value to the area by improving the condition of the koala and greater glider habitat. Additionally, the offset is located adjacent to existing offset areas on the property, which will further assist in improving landscape connectivity and overall habitat value.</p>
	<p>Barbed wire fencing (entanglement). There are occasional losses of individuals.</p>	<p><i>Section 7: Fencing</i> – internal fences will not be constructed in the offset area with the possible exception of riparian fencing to protect sapling regrowth. Current fencing is all external to the offset.</p>
	<p>Hyper-predation by owls The greater glider forms a significant part of the powerful owl's diet (Bilney et al., 2006).</p>	<p>Refer to the contribution to biodiversity corridors and connectivity - <i>Section 3.2</i> and no timber harvesting in <i>Section 8</i> and general enhancement of habitat quality to support greater glider population.</p>
Approved Conservation Advice for <i>Geophaps scripta scripta</i> (Squatter Pigeon southern), Canberra: Department of the Environment.	<p>Ongoing vegetation clearance and fragmentation Birds do not move far from woodland trees that provide protection from predatory birds, and do not typically forage further than 100 m from remnant trees or patches of wooded habitat (DoEE 2018). The population declined rapidly during the late 19th and early 20th centuries and continued to decline in NSW and southern Queensland where it is now very rare (Cooper et al., 2014). In NSW, the disappearance of the subspecies has been attributed to overgrazing at times of drought, followed by clearing of vegetation. Current threats include ongoing vegetation clearance and fragmentation,</p>	<p><i>Section 7: Forestry and native vegetation</i> - clearing is not permitted under the plan. No forestry or timber harvesting activities will be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset area is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.</p>
	<p>Overgrazing of habitat by livestock and feral herbivores; trampling of nests by domestic stock. The population declined rapidly during the late 19th and early 20th centuries and continued to decline in NSW and southern Queensland where the species is now very rare (Cooper et al., 2014). In NSW, the disappearance of the subspecies has been attributed to overgrazing at times of drought, followed by clearing of vegetation.</p>	<p><i>Section 7: Grazing</i> – grazing is not permitted during the wet season or the later part of the squatter pigeon breeding season Aug-Oct; ground cover levels will be monitored and managed. Stock will be grazed in the offset areas for fuel reduction purposes during March to July (inclusive), to part avoid squatter pigeon breeding season and nest trampling.</p>
	<p>Introduction of weeds Squatter pigeons have a mainly granivorous diet, mostly feeding on the seeds of legumes in the family Fabaceae (45% of food volume) including</p>	<p><i>Section 7: Pest plants</i> – will be reduced to less than 10% of total cover. Weed control will be undertaken throughout the offset areas and then periodically, as required, to treat the weeds at the optimum time in their life</p>

Document	Key threats	Comment/Relevant Section in document
	those of exotic pasture plants such as <i>Stylosanthes</i> spp., and native grasses in the family Poaceae (23% of food volume) (Crome 1976; Higgins and Davies 1996). They occasionally forage in sown grasslands and pastures, feeding on exotic legumes such as <i>Stylosanthes</i> spp. (Crome 1976). A high weed cover results in competition for the bird's diet.	cycles. The practices will control and minimise the spread of existing weed species.
	Inappropriate fire regimes Hot fires that impact vegetation community structure and increase the likelihood of weed invasion after the initial reduction in groundcover.	<i>Section 7:</i> Fire – fire is not permitted in the offset area unless for fuel reduction purposes at no less than seven-year intervals and no more than 30% of the area in any year (this is restricted to the Eucalypt areas).
	Predation by feral animals including cats and foxes	<i>Section 8:</i> Feral animals – will be monitored and controlled. The presence of feral animals will be minimised and existing populations of feral animals (feral cats, dogs and pigs) controlled within the offset areas in accordance with the <i>Biosecurity Act 2014</i> (Qld). Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.
	Illegal shooting	<i>Section 7:</i> Access – access by unauthorised personnel will not be permitted. Monthly inspections will confirm fences are preventing cattle and unauthorised people from accessing the offset area. The offset areas are on a large privately owned agricultural properties in a remote area (<i>Figure 4</i>) with access to the area restricted to the land managers.
Approved Conservation Advice for <i>Denisonia maculata</i> (Ornamental Snake), Canberra: Department of the Environment, 2014.	Vegetation clearing for cropping and pasture and grazing The main identified threat to the ornamental snake is a continued legacy of past broadscale land clearing and habitat degradation.	<i>Section 7:</i> Forestry and native vegetation clearing will not be permitted under the plan. No forestry or timber harvesting activities will be authorised during the period of the declared area. Forestry and native timber harvesting practices in the offset is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	Potential poisoning resulting from the ingestion of cane toads Destruction of wetland habitat by feral pigs Destruction of wetland habitat by feral pigs (<i>Sus scrofa</i>) is also a threat, along with the associated destruction of frog habitat and direct competition for their food source (frogs) (WWF-Australia/QMDC, 2008).	<i>Section 7:</i> Feral animals – monitoring and control will be undertaken by the landholder. The presence of feral animals will be monitored and control of existing populations of feral animals (feral cats, dogs and pigs) will be undertaken within the offset areas in accordance with the <i>Biosecurity Act 2014</i> (Qld).
Threat Abatement Plan for predation by the European red fox Australian Government, 2008	Predation by foxes (applies to each fauna species)	<i>Section 7:</i> Feral animals – monitoring and control will be undertaken. <i>Section 9:</i> The presence of feral animals will be monitored and control of existing populations of feral animals (feral cats, rabbits, foxes, dogs and pigs) will be undertaken within the offset areas in accordance with the <i>Biosecurity Act 2014</i> (Qld).
Threat Abatement Plan for predation by feral cats . Australian Government, 2015	Predation by cats (applies to each fauna species)	

Document	Key threats	Comment/Relevant Section in document
Threat Abatement plan for competition and land degradation by rabbits . Australian Government, 2016	Presence of rabbits (applies to each fauna species and each TEC)	
Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (<i>Sus scrofa</i>). Australian Government, 2017.	Presence of wild pigs (applies to each fauna species and each TEC)	

3. Offset properties

3.1. Overview of the offset properties - '██████████' and '██████████'

The selected properties for the offset site are portions of ██████████ and ██████████ (see Figure 1). Both properties are located within the Brigalow Belt Bioregion. ██████████ of the Project impact area and ██████████

The properties were selected for their suitability, including:

- Delivery of the offset in close proximity to the impact site.
- Proximity to state biodiversity corridors or linking to other areas of conservation. The ██████████ offset area is located within a corridor of State significance (Figure 2) and the offset area on ██████████ adjoins the ██████████ National Park (Figure 3).
- Field verified biodiversity values present on the properties (Figure 4 and Figure 5).
- The potential to locate future offsets on the same properties for other projects thus creating larger areas of biodiversity offsets and achieving a better environmental outcome.

Both properties are primarily used for agricultural grazing purposes. It is likely that that other areas within both properties will be proposed and used for other biodiversity offsets, including by AASMC but also potentially other third party corporations.

3.2. Connectivity

On ██████████, the offset site will improve the regional biodiversity value at the landscape level, by enhancing the quality of habitat within the state recognised biodiversity corridor (Figure 2).

The Offset Investigation Area on ██████████ will be utilised for further offset projects over time, which will further enhance the connectivity and quality of the habitat in the bioregional corridor. The ground verified regional ecosystems are illustrated in Figure 4.

On ██████████, the offset area is a continuous patch of suitable habitat that adjoins other vegetated areas which will likely be used for offsets in the near future. The Offset sits within the mapped bioregional corridor and importantly adjoins the ██████████ National Park to the west creating a large expanse of conservation land (Figure 3). ██████████ also supports an existing offset area along the southern boundary of the property, immediately adjacent to ██████████ National Park and immediately west of the offset land. Survey verified regional ecosystems are illustrated in Figure 5.

Additional offset areas are planned for both properties enabling the offset areas to be further connected and provide larger tracts of habitat for the species being protected.

Figure 2: State biodiversity corridors - [REDACTED]

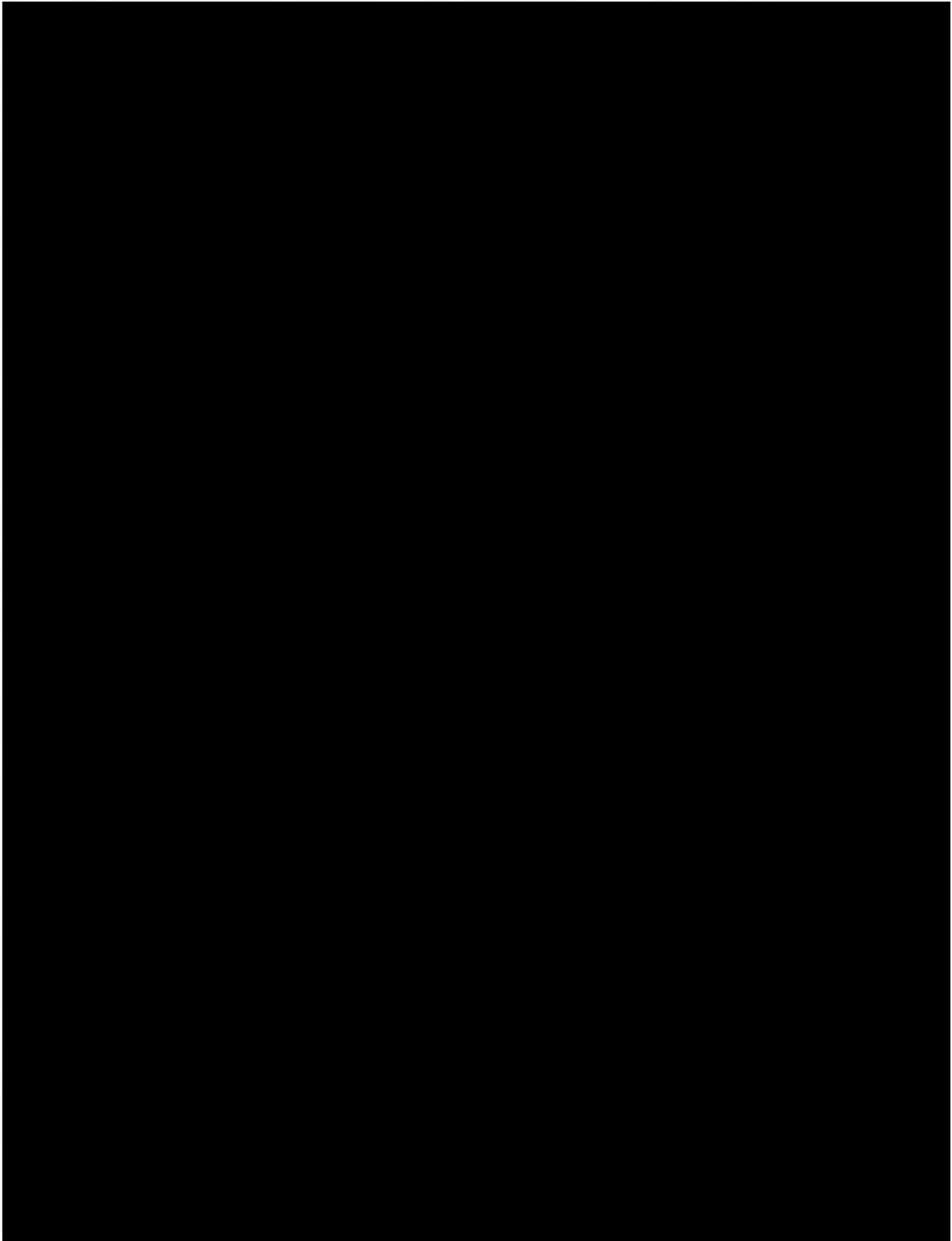


Figure 3: [REDACTED] Nature Refuge and [REDACTED] offset – [REDACTED]

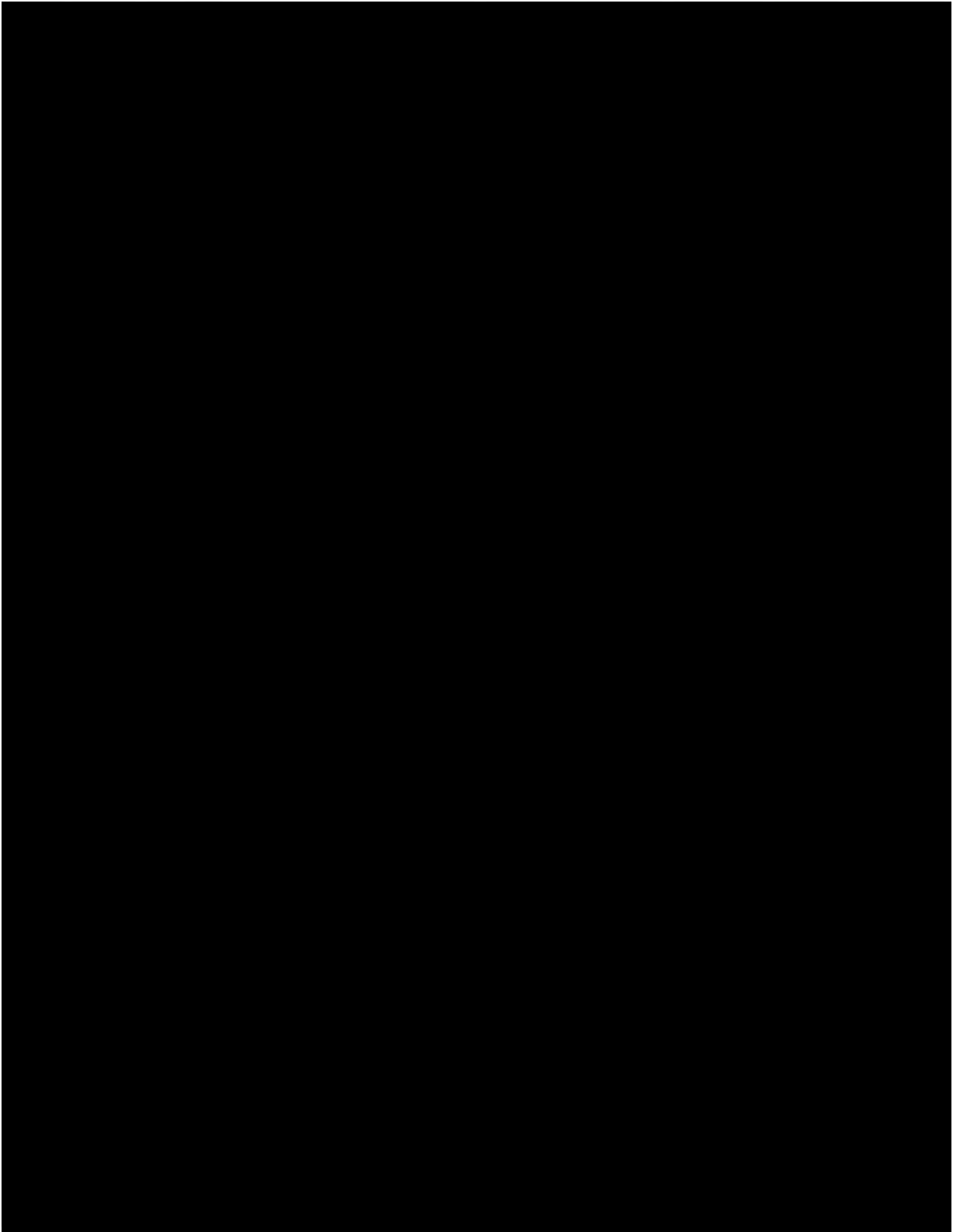


Figure 4: Field-verified regional ecosystems – [REDACTED]

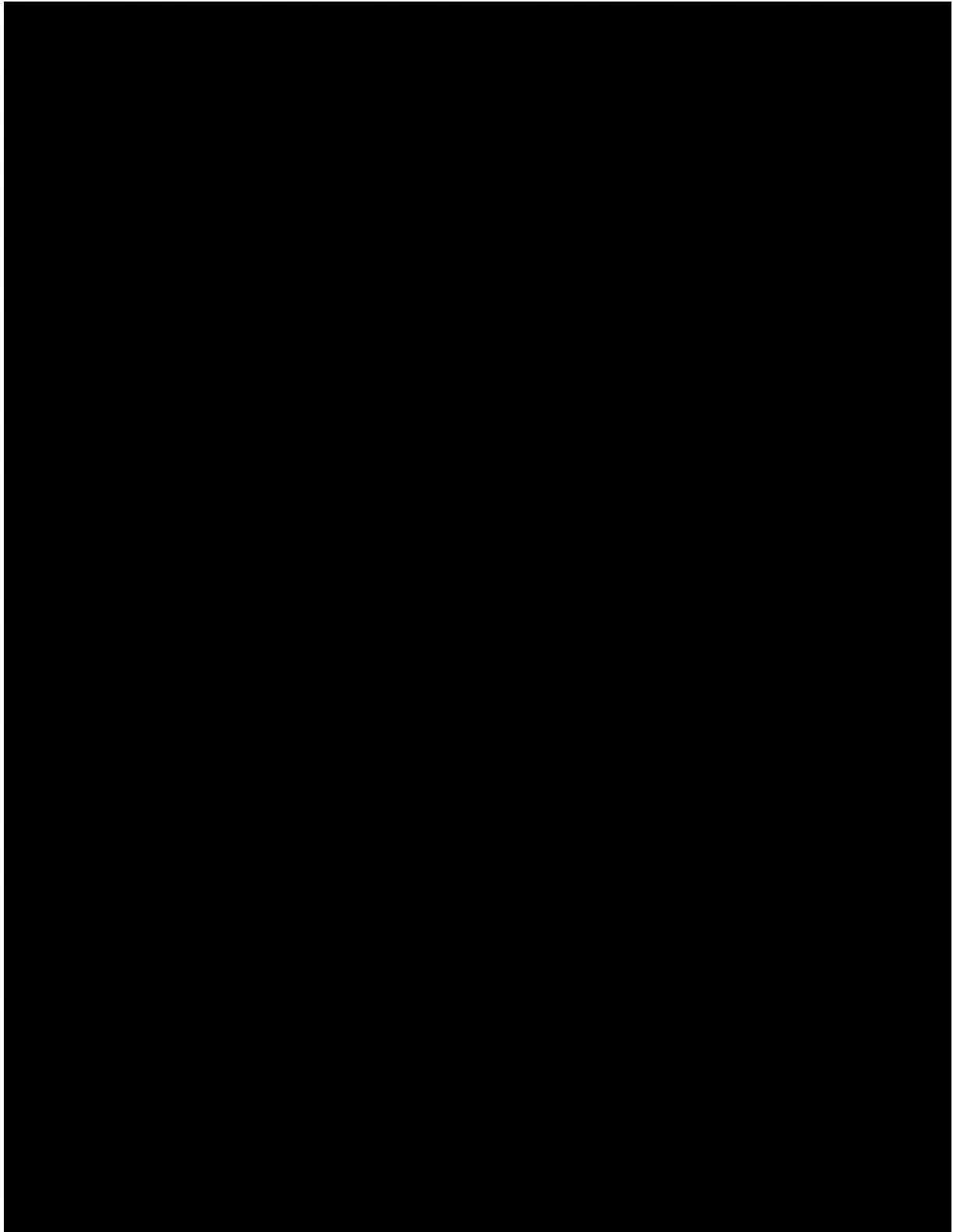
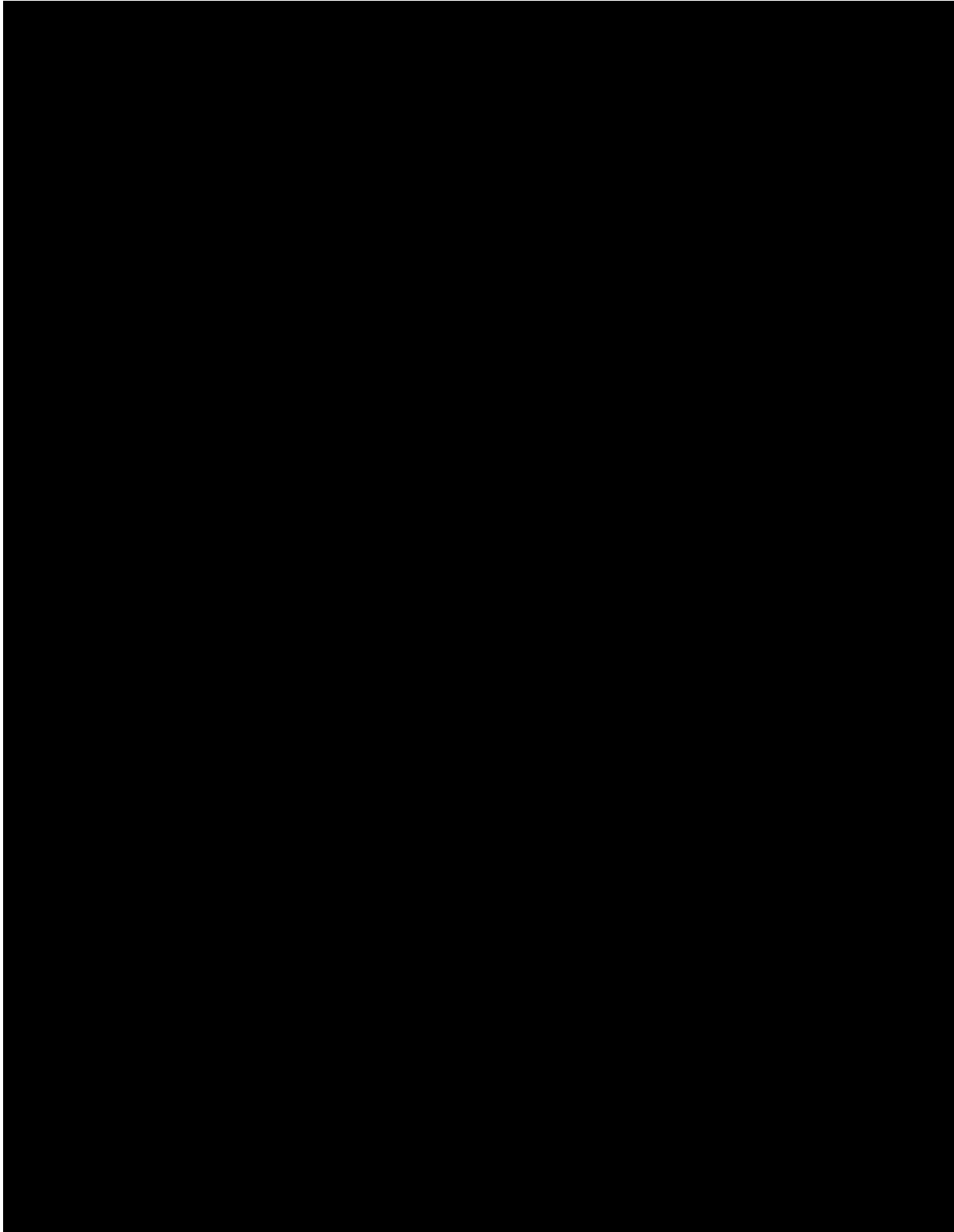


Figure 5: Field-verified regional ecosystems – [REDACTED]



4. Offset site biodiversity values

4.1. Site assessment methodology to determine ecological values

BioCondition assessments were conducted in accordance with the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual* (Eyre et al., 2015) (the BioCondition Manual) which involved the collection of spatial data and in situ vegetation surveys, assessing site condition, and spatial context.

Habitat quality assessments were undertaken in accordance with the *Guide to determining terrestrial habitat quality - A toolkit for assessing land-based offsets under the Queensland Environmental Offsets Policy* (2020) within vegetation (i.e. relevant broad vegetation groups (BVGs), REs and habitat) suitable for offsetting MNES and MSES values.

4.1.1. [REDACTED]

The [REDACTED] Offset Investigation Area ecological survey was undertaken by [REDACTED] Consulting on 17-18 March 2021, supplemented by [REDACTED] on 26-27 April 2021 and a more extensive survey by [REDACTED] ecologists over the period of 10-16 May 2021 (*Appendix A*). [REDACTED] then supplemented this latter survey with a specific Ornamental snake targeted survey and habitat assessment in 2022.

The ecological surveys included:

- a desktop review of available vegetation mapping and environmental database records
- ground-truthing of the DNRME mapped REs and identifying MNES threatened ecological communities (TECs)
- targeted surveys and habitat assessments for MNES and MSES threatened fauna requiring offsets
- observations regarding the ecological function and suitability of vegetation communities as an offset site.

Targeted surveys and habitat assessments were undertaken to inform the habitat suitability for threatened fauna species. Habitat assessments included these attributes:

- density of tree hollows >10 cm diameter (per ha)
- tree stem density
- composition and cover (%) of koala food tree species
- gilgai presence and depth
- presence of woody debris.

Targeted surveys included:

- active, diurnal searches for koala presence (i.e. scratches and scat) and squatter pigeon within suitable habitat. A total survey effort of 140 person hours were undertaken.
- nocturnal, spotlighting transects were undertaken over two nights, targeting the koala and greater glider. Transects were undertaken by vehicle and on foot and totalled approximately 24 person-hours.
- opportunistic observations for the detection of threatened flora and fauna species (i.e. squatter pigeon).

4.1.2. [REDACTED]

The Ornamental snake offset which was surveyed in September 2022 by [REDACTED] (*Appendix B*).

The surveys were undertaken as per the *Guide to determining terrestrial habitat quality - A toolkit for assessing land-based offsets under the Queensland Environmental Offsets Policy* (2020).

4.2. General description and vegetation habitat values

Detailed maps of the proposed offset areas for each of the TEC/species on the offset site are provided in the attached ecology reports.

The [REDACTED] offset area is centred on range country dominated by eucalypt woodland with numerous drainage lines and small creeks.

A number of tributaries (stream order 1 and 2 watercourses) are included in the [REDACTED] offset area, these flow into the larger creek systems, further strengthening connectivity associated with watercourses and the broader landscape. [REDACTED], within the [REDACTED] property, has permanent water holes, seasonal bed flow in the creek. Additionally, there are several farm dams that provide suitable areas to support Squatter pigeon breeding habitat, and additional drinking sources for Koala in times of drought. As required by Condition 4, the watercourses also provide connected riparian habitat that will support Greater glider breeding and movement. The offset will provide improved connectivity for this species along these watercourses as trees mature and riparian vegetation recovers with reduced grazing pressures.

The offset area on [REDACTED] contains Koala and Greater glider habitat in the form of remnant Eucalypt woodlands including poplar box, ironbark, bluegum and *Corymbia* species. Koala, greater glider and squatter pigeon presence were confirmed during surveys.

The offset area on [REDACTED] for the Ornamental snake is located in an area of remnant coolabah woodland on alluvial soils. The area contains cracking soils and gilgai (water depressions) that provide habitat for frogs that make up the key prey species for Ornamental snakes. These areas represent preferred habitat for the Ornamental snake.

4.3. Offset sites start values

The results of the habitat quality assessments of the two areas and the various assessment units that occur within the offset areas are summarised in Tables 5 and 6. Field data is provided within the ecology reports (*Appendices A and B*). The areas of offset have been determined based on the field verified ecological data and the EPBC Act Offsets Assessment Guide (OAG). Populated OAGs for each species are included in Appendix C.

4.3.1. [REDACTED]

4.3.1.1. Koala

Proposed offset area: [REDACTED] hectares.

The ecological values of the offset site have been selected to be consistent with the definition of Koala habitat contained in the *EPBC Act Referral Guidelines for the vulnerable koala* (DoE 2014), which define koala habitat as:

“any forest or woodland containing species that are known Koala food trees, or shrubland with emergent food trees. This can include remnant and non- remnant vegetation in natural, agricultural, urban and peri-urban environments.”

Koala food trees, particularly *Eucalyptus populnea*, *E. camaldulensis* and *E. tereticornis* occur within the riparian woodlands in the ‘lower country’ of the property (i.e. RE 11.3.2, 11.3.4 and 11.3.25); whereas *E. crebra* is the dominant species in RE 11.10.7 in the ‘range country’. Evidence of Koala (Photo 1 and 2) were observed at numerous locations along riparian corridors within the property although no individuals were directly observed during the field survey.

The property provides approximately 7,161.03 ha of suitable Koala habitat including remnant and regrowth RE 11.3.2, RE 11.3.4, RE 11.3.25, RE 11.5.9, RE 11.9.7, RE 11.9.9 and RE 11.10.7.



Photos 1 and 2: Koala scratches observed on the trunk of an *E. tereticornis* during the [REDACTED] field survey

The offset site will be managed to reduce the number of predatory animals present, prohibit timber harvesting and mitigate the risk of hot fires.

4.3.1.2. Greater glider

Proposed offset area: [REDACTED] hectares.

The offset site was selected to be consistent with the definition of Greater glider habitat in the *Guide to greater glider habitat in Queensland* (Eyre et al 2022), which defines habitat as:

woodland areas within the known distribution that contain suitable hollow bearing trees, dominated by Corymbia citriodora, Eucalyptus moluccana, E. tereticornis, E. crebra, C. intermedia and E. portuensis.

The Greater glider habitat offset is collocated with the Koala offset contains areas with tree hollows. Greater gliders were observed at three locations within the property during the field surveys. Suitable habitat for greater glider throughout the property is provided by remnant vegetation comprising RE 11.3.2, RE 11.3.4, RE 11.3.25, RE 11.5.9, RE 11.9.7, RE 11.9.9 and RE 11.10.7.

A number of large, hollow bearing trees, ranging from 1-12 hollows/ha, were observed throughout the offset area in association with eucalypt dominated woodlands.

The offset site will be managed to increase the number of hollows available by prohibiting timber harvesting and the use of hot fires. Thinning of areas that have too high a stem density will also be undertaken to enable the faster growth of the remaining trees to develop hollows.



Photos 3 and 4: Greater gliders observed within the [REDACTED] property during the [REDACTED] field survey

4.3.1.3. Squatter pigeon

Proposed offset area: [REDACTED] hectares.

The Squatter pigeon offset is collocated with the Koala and Greater glider offset areas.

Squatter Pigeon (southern) habitat is generally defined as:

open-forests to sparse, open-woodlands and scrub that are:

- *mostly dominated in the overstorey by Eucalyptus, Corymbia, Acacia or Callitris species*
- *remnant, regrowth or partly modified vegetation communities, and*
- *within 1 km of water bodies or courses for breeding and within 3 km for foraging.*

Squatter pigeon were recorded at two locations during the field survey within the property. Suitable habitat for squatter pigeon occurs throughout the property in vegetation dominated by Eucalypt species.

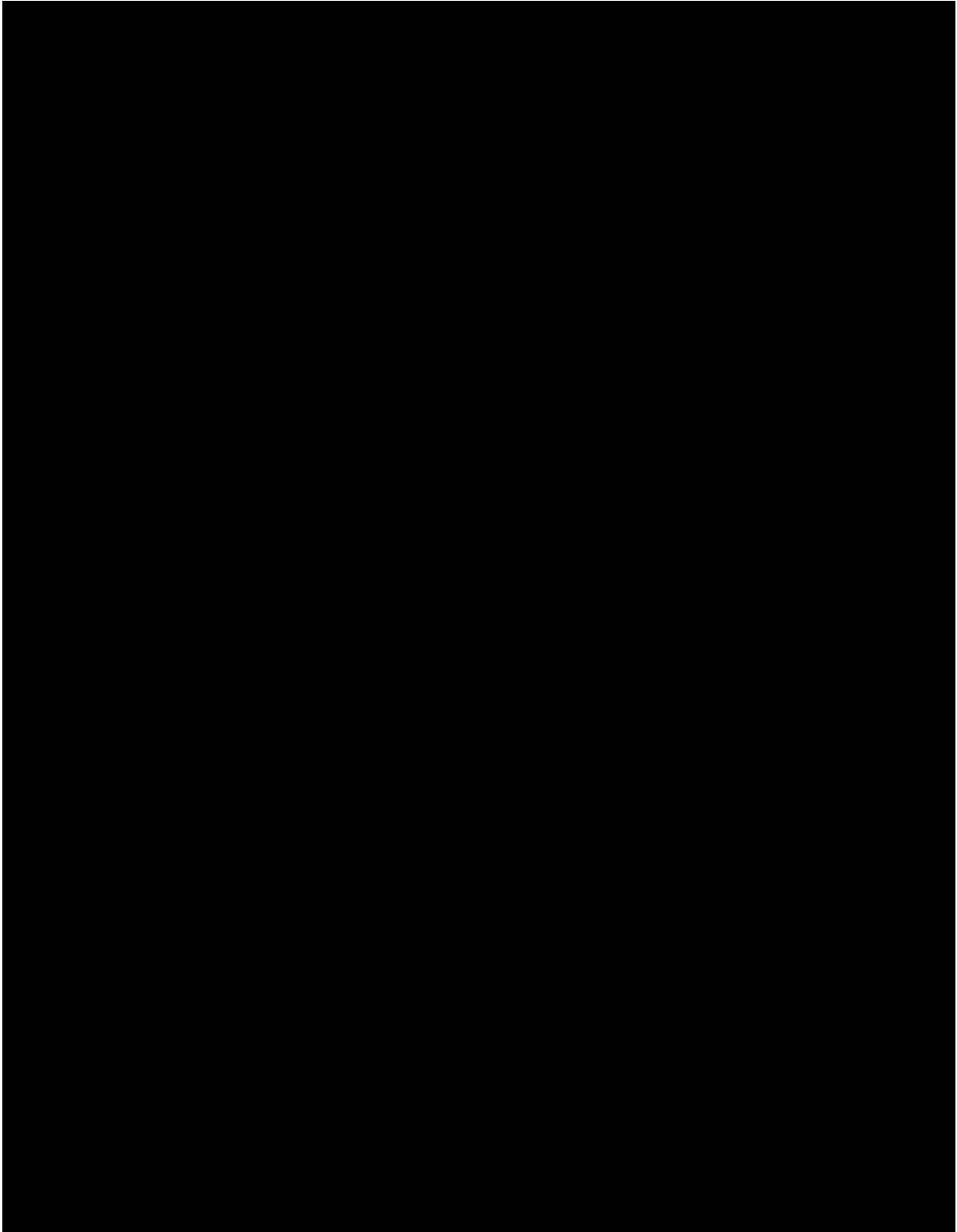


Photos 5 and 6: Squatter pigeon observed within the [REDACTED] property during the [REDACTED] field survey

Table 5: Koala, Greater glider and Squatter pigeon offset area habitat quality assessment results

Regional ecosystem	Description	Assessment sites	Start Habitat quality score	Area (ha)	Contribution to offset area as a % of the final area (ha)
11.10.7	<i>Eucalyptus crebra</i> woodland on coarse-grained sedimentary rocks	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
11.3.4	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. woodland on alluvial plains	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Figure 6: Koala, Greater glider and Squatter pigeon offset area – [REDACTED]



4.3.2. [REDACTED]

4.3.2.1. Ornamental snake

Required offset area: [REDACTED] hectares.

Ornamental snake habitat is defined as:

gilgai mounds and depressions with cracking-clay soils, moist areas (particularly within, or close to, habitat that is known to be favoured by its prey (frogs)) with microhabitat features (i.e. logs, woody debris and leaf litter).

The [REDACTED] ha offset area on [REDACTED] selected for the Ornamental snake is located within a patch of remnant vegetation that has been ground-truthed as RE 11.3.3 *Eucalyptus coolabah woodland on alluvial plains*. Within the offset, RE 11.3.3 contains cracking clay soils which were measured to be up to 25 cm deep and 3 cm wide at the time of survey, with the expectation that cracks will only deepen and widen with ongoing drying out of soils across the offset land. These cracking clays are suitable as Ornamental snake foraging habitat as they are favoured by their primary prey – frogs. They are also likely to provide good refuge habitat for Ornamental snake during drier months. The presence of logs, woody debris and organic litter cover was noted as these are also important microhabitat features for Ornamental snake shelter habitat.

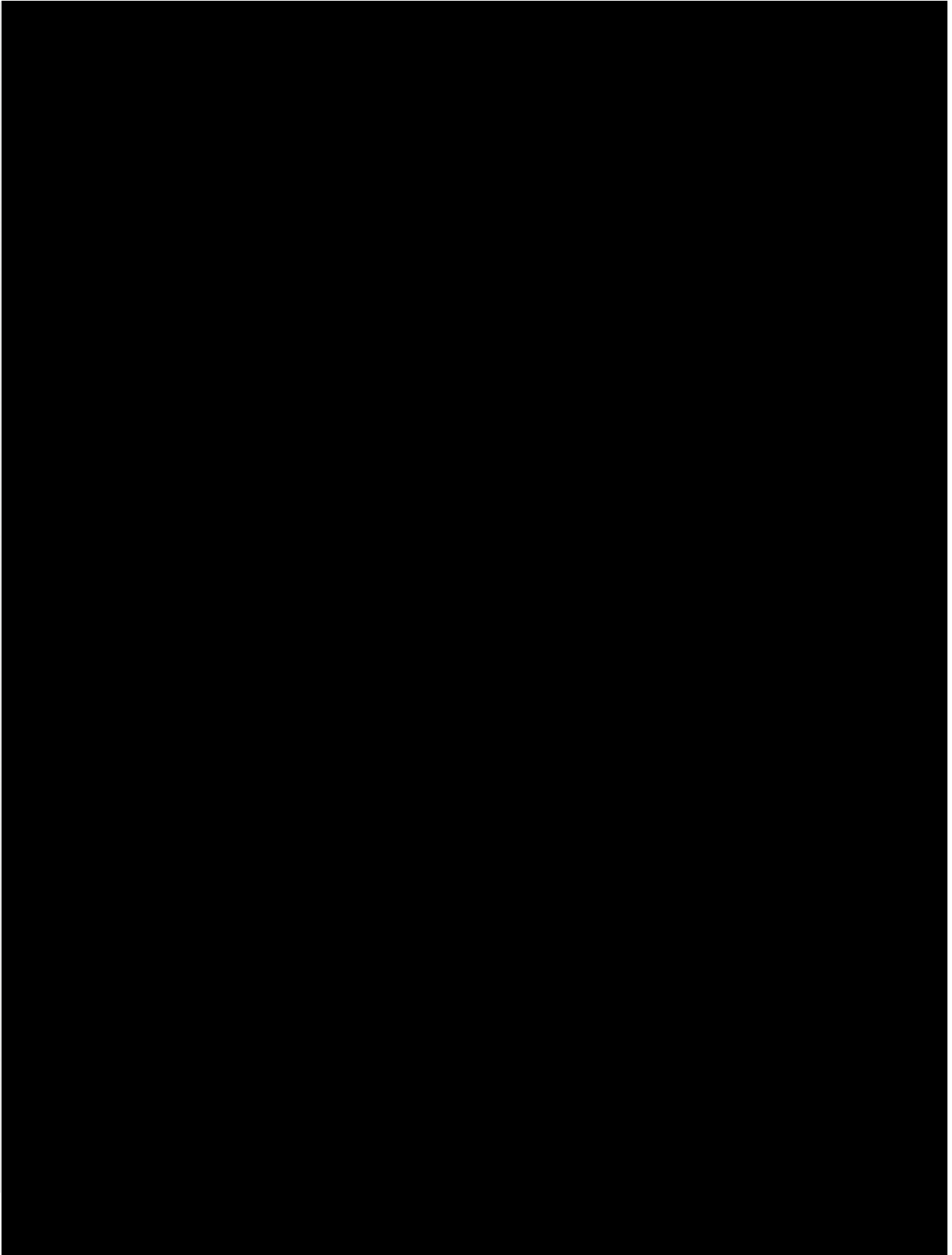
The whole of the offset land, and much of the immediate landscape, is mapped as supporting core Ornamental snake habitat in accordance with the Queensland DES habitat suitability modelling. Numerous ornamental snake records have been confirmed within close proximity to the offset land, including two records confirmed by [REDACTED] of [REDACTED] Australia from within an existing offset area on [REDACTED] ('Mount [REDACTED] offset; Figure 1). The Mount [REDACTED] offset area is less than 1 km from the offset, with contiguous remnant vegetation between. Populations within the Mount [REDACTED] offset area are within similarly cracking clay habitat. Habitat between the offset land and confirmed populations to the west are considered functionally connected. As such, given the close proximity of ornamental snake records and the presence of similarly deep cracking clay soil, the Ornamental snake is considered likely to occur within the offset land.

The Ornamental snake offset area will be managed to prohibit the conversion of the area to cropping, reduce the amount of buffel grass, prohibit grazing when the soil is wet and enable the accumulation of further woody debris over time.

Table 6: Ornamental snake offset area habitat quality assessment results

Regional ecosystem	Description	Assessment sites	Start Habitat quality score	Area (ha)	Contribution to offset area as a % of the final area (ha)
11.3.3	Eucalyptus coolabah woodland on alluvial plains	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

Figure 7: Ornamental snake offset area – [REDACTED]



5. Offset completion criteria and performance targets

Offset completion criteria have been determined for each species based on an understanding of the specific habitat, connectivity and other ecological values (*Table 7*). These criteria were initially derived from detailed ecology survey information of the offset sites utilising an approach specified within the *Guide to determining terrestrial habitat quality* (DES, 2020). The targeted habitat quality meets guidelines published by ANZECC (2000), stating completion criteria should be:

- Specific enough to reflect unique set of environmental, social and economic circumstances.
- Flexible enough to adapt to changing circumstances without compromising objectives.
- Include environmental indicators suitable for demonstrating that rehabilitation trends are heading in the right direction.
- Undergo periodic review resulting in modification if required due to changed circumstances or improved knowledge.
- Based on targeted research which results in more informed decisions.

Over the course of the management period a set number of interim completion criteria have been proposed for each species to track the trajectory of habitat quality improvement towards the desired final completion criteria. The timing for these interim targets corresponds with the 5 yearly targeted species surveys and detailed ecological condition monitoring in years 2030, 2035, 2040 and 2045.

Interim targets were derived for each species by identifying the attributes expected to increase over the period of the approval. The values were determined by differentiating between specific attributes of which the majority were longer term targets (e.g. species richness, tree canopy cover, number of large trees) and those where an initial benefit could be realised early (e.g. recruitment of woody species, non-native plant cover).

The completion of management actions identified in *Section 7* will enable the offset site to improve and achieve the scores required, thus meeting and maintaining the completion criteria required of the offset. The annual reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any *force majeure* events impacting the offset site, and any non-compliance with the management plan.

Table 7: Interim targets and completion criteria

Protected Matter	Impact area (ha)	Habitat quality score	Property	Assessment Sites	Offset area (ha)	Regional ecosystems	Habitat start quality score	Habitat quality score Year 5	Habitat quality score Year 10	Habitat quality score Year 15	Habitat finish quality score
<i>Koala</i>	530	█	████████	█ █ █	████	█ █ █	█	████	████	████	█
<i>Greater glider</i>	530	█	████████	█ █ █	████	█ █ █	█	████	████	████	█
<i>Squatter pigeon</i>	535	█	████████	█ █ █	████	█ █ █	█	████	█	████	█
<i>Ornamental snake</i>	41	█	████████	█ █	█	█	█	████	█	████	█

Part B: Land Management Plan

6. Analysis of risks to achieving management objectives and offset completion criteria

Potential risks to achieving the management objectives and outcomes have been considered in preparation of this OAMP. Risks have been assessed against the standard risk matrix used by the Department. The risk matrix has been used to assess the risk that the plan's objectives will not be met and identify the sources of those risks and strategies for managing them.

The risk assessment:

- a) identified events that will, may, or are likely to impact the attainment of the completion criteria
- b) assessed the likelihood and consequences of those events, and characterises residual risk levels, taking into consideration the mitigation of the risk by implementing the management actions
- c) identified the level of uncertainty in mitigating the risk with the management actions and trigger criteria and corrective actions until the risk is reduced to an acceptable level.

Note: Throughout the application of the risk assessment a conservative approach has been adopted in line with the precautionary principle, which states that, if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

Table 8: Risk matrix

RISK MATRIX						
Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management activities are implemented)						
Highly likely	Is expected to occur in most circumstances					
Likely	Will probably occur during the life of the project					
Possible	Might occur during the life of the project					
Unlikely	Could occur but considered unlikely or doubtful					
Rare	May occur in exceptional circumstances					
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)						
Minor	Minor incident of environmental damage that can be reversed <i>(e.g. short-term delays to achieving plan objectives, implementing low-cost, well-characterised corrective actions)</i>					
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts <i>(e.g. short term delays to achieving plan objectives, implementing well-characterised, high-cost/effort corrective actions)</i>					
High	Substantial instances of environmental damage that could be reversed with intensive efforts <i>(e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions)</i>					
Major	Major loss of environmental amenity and real danger of continuing <i>(e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies)</i>					
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage <i>(e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies)</i>					
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Table 9: Risk assessment for the offset site

Note: The risk ranking codes relate to the risk matrix as follows: L = Likelihood C = Consequence R = Risk

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Force majeure events									
Mining of the offset site	No current permits cover the proposed offset sites. Open cut mining may produce full clearing of the offset site.	Rare	Critical	High	Offset area management	No current permits cover the offset sites. The legal security over the site makes it known that the area is an offset. No available legal mechanism would render mining impossible on the offset sites, however the Voluntary Declaration under the VMA would significantly increase offset obligations upon any person proposing to impact the offset sites.	Rare	Critical	High
Drought	The threat posed by drought is a decrease in dry matter yield and groundcover, an increase in the likelihood of unplanned fire due to the dry conditions that could be started by lightning strike during storms and an increase in weed cover when rainfall was received. There would also be lower levels of growth expected.	Likely	Moderate	Medium	Offset area management Grazing management	Cattle will be excluded from the offset areas during times of drought. Limited mitigation measures can be implemented. Should the offset be deemed by the approval holder or the Department to be delayed due to drought, both parties will work together to determine an appropriate response.	Likely	Moderate	Medium
Cyclones/ severe tropical lows/ flooding	The most significant impact from tropical cyclones or tropical lows is typically flooding. Systems generally form between November and April.	Likely	Moderate	Medium	Offset area management	Limited mitigation measures can be implemented. The offset areas on [redacted] and [redacted] are both in elevated parts of the landscape and the likelihood of extended flooding of the areas is extremely low. Wind damage to bigger trees would be expected to be the largest impact. However, cyclones and/or severe tropical lows are relatively infrequent (though likely to occur at some point during the life of the approval). However, flooding is not expected to be of sufficient duration, and winds are not expected to be sufficiently severe, to cause substantial long-term harm to the site. Additionally, the increased availability of soil moisture following extreme weather events is expected to increase growth rates, likely assisting natural repair of any potential damage. Increased soil moisture may assist weed growth, so a meander survey across the entire site will occur as soon after the end of a cyclone and any associated flooding as is safe and reasonably practicable to detect any areas of increased weed density. Flooding may also contribute to erosion.	Likely	Minor	Low
Degradation of habitat or vegetation loss through land clearing									
Degradation of habitat	The degradation of habitat due to the lack of environmental management of the offsets area including appropriate grazing regimes, invasive plant control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management Grazing management	Implementation of the management actions and adaptive management framework as outlined in this OAMP.	Unlikely	Minor	Low
Erosion	Raindrops hit bare soil with enough force to break the soil aggregates. These fragments wash into soil pores and prevent water from infiltrating the soil. Water then accumulates on the surface and increases runoff which takes soil with it.	Highly likely	Minor	Medium	Offset area management Grazing management	The expected severity of erosion at this site may occur due to topography of the site. However, that risk can be further reduced. Cattle will be excluded from the offset areas during the wet season and during drought periods. During March - July dry matter yields will be maintained at between 700kg/ha and 1200kg/ha to provide a base vegetation cover.	Possible	Minor	Low
Timber harvesting/ collection	Unauthorised access to the offset area may result in timber harvesting/collection	Unlikely	Moderate	Low	Offset area management Site access control	Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within 12 months of the approval of this OAMP. Complete the installation of any new planned fences, within twelve months of the approval of this OAMP; with the exception of any future riparian fencing identified as being required to protect sapling growth. All field monitoring (rapid and detailed) will report on any evidence of timber harvesting (refer Table 12).	Rare	Moderate	Low

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Unplanned clearing	<p>The offset site occurs on two properties that are used for cattle production. It is possible for unplanned / illegal clearing for agriculture activities but considered improbable as the offset site will be mapped as Category A on the PMAV.</p> <p>Clearing can also occur by vehicles traversing the area off designated roads/tracks and/or illegal camping. This is also considered improbable, as the site is remote and access to the site will be restricted.</p> <p>The most plausible (though still unlikely) cause of unplanned/illegal clearing would be if aerial spraying on adjacent properties strayed across the offset boundary.</p>	Unlikely	Major	High	<p>Offset area management</p> <p>Site access control</p>	<p>Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within 12 months of the approval of this OAMP.</p> <p>Within 12 months of the approval of this OAMP, register a Voluntary Declaration over the Offset Site, ensuring it is shown as Category A vegetation on the PMAV.</p> <p>All monitoring (rapid and detailed) will report on any evidence of clearing.</p>	Rare	Major	Medium
Fire: the impact from uncontrolled fire would be a reduction in groundcover, thinning of the canopy and slowing of the offset site achieving the completion criteria									
Unplanned or non-controlled fire in offset area.	The impact from uncontrolled fire would be a reduction in dry matter yields and overall groundcover, thinning of the canopy, destruction of regrowth and emerging saplings and an overall slowing of the offset site achieving the completion criteria.	Likely	Moderate	Medium	Fire management	<p>The [redacted] offset site is comprised of remnant eucalypt species circa 12-22m in height. These communities are adapted to fire and the risk of a 100% loss is low due to lower dry matter yields (fuel load) within the communities that are further managed with grazing.</p> <p>The offset area on [redacted] is located beside a large cropping area and fire is not used in the vicinity. The largest risk mitigation measure is to maintain low dry matter yield on the site. The nearby presence of [redacted] National Park poses a risk of uncontrolled fires encroaching on the area.</p>	Possible	Minor	Low
Increased fire risk due to high fuel loads	During periods when a low-level grazing regime has occurred and an average or above average wet season, there is an opportunity for fuel loads in the form of dry matter to accumulate to unacceptable levels. When this occurs and the high levels of fuel are present prior to summer, then the risk of wild and/or high-intensity fires is exacerbated.	Possible	High	Medium	Fire management	<p>Graze to reduce dry matter yield to between 700kg/ha and 1,200kg/ha.</p> <p>On the [redacted] offset area, a cold fire to be used during the months of June, July, August and September when wind speeds are less than 5km/h on the offset site.</p>	Unlikely	Minor	Low
Invasive plants: introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the Biosecurity Act 2014 (Qld)									
New infestations of invasive weed species in the offset area.	<p>Infestation of previously unidentified invasive weeds within the offset area.</p> <p>If a weed infestation is unchecked, it may cause a significant deterioration in the offset site.</p>	Possible	High	Medium	Invasive plants management listed under the <i>Biosecurity Act 2014</i> (Qld)	<p>The offset site on [redacted] and [redacted] are remote and access to the offset area will be limited, to reduce/prevent pathogen/propagule transmission vectors.</p> <p>All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site.</p> <p>If a new weed infestation is identified, weed management measures will occur as per <i>Table 10</i>.</p>	Unlikely	Minor	Low
Expansion of existing infestations of declared weed species in the offset area	The extent of existing infestations of restricted invasive plants species expand or the species become more abundant within the area.	Highly likely	High	High	Invasive plants management listed under the <i>Biosecurity Act 2014</i> (Qld)	<p>Access to the offset area will be restricted.</p> <p>Chemical and/or mechanical control of all restricted invasive plants in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.</p>	Unlikely	Minor	Low
Pest/feral animals in the offset area									
Increased population of feral animals in the offset area.	Wild cat, pig and dog populations are extensive and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.	Highly likely	High	High	<p>Pest animal management</p> <p>Feral pig management</p>	<p>Current control of pigs and wild dogs is undertaken via a baiting program on the property. This is augmented with shooting and trapping of wild pigs if numbers increase.</p> <p>Additionally, the Land Manager, during quarterly inspections of the offset area may remove any wild cats, pigs or wild dogs that are seen. If an increase in pig or dog activity is noted, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.</p>	Possible	Minor	Low

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Degradation of habitat by overgrazing									
Unauthorised or inappropriate grazing in offset area	<p>High density grazing over an extended period destroys shrubs and native grass cover and slows the regeneration of habitat.</p> <p>The natural condition of the native ground cover is a low cover and hence any grazing undertaken is to reduce exotic grass cover whilst retaining a minimum of 700kg/ha of dry matter yield at the end of the dry season.</p> <p>Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions.</p>	Possible	High	Medium	Grazing management	<p>The offsets sit within larger properties with other offsets assigned to other projects. The fences used to control stock access are located outside of these particular offset areas and are used to manage a larger area than just the specific offset.</p> <p>Fences are in working order and allow for exclusion of cattle when needed.</p> <p>Signage will be installed on all major access gates to ensure the Environmental Offset Area is well signposted.</p> <p>Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions. However, grazing used as required when dry matter yields exceed 1200kg/ha and the fire risk is high.</p> <p>Cattle are excluded from all areas during the wet season.</p> <p>Cattle are excluded from all areas during drought and when dry matter yields are below 1200kg/ha</p>	Unlikely	Minor	Low
Degradation of habitat or vegetation loss through thickening of native vegetation									
Thickening of vegetation in the offset area	<p>Clearing or the harvesting of the larger trees for sawlogs and other timber products has resulted in a large number of eucalypt seedlings establishing resulting in a thickened or high stem density.</p> <p>The soil has a finite resource of nutrients and water, and this high density of stems results in a situation whereby the stems cease growing and stay at an immature condition/size unless a force majeure event or intervention occurs to reduce the stem density and therefore allowing larger trees to establish and therefore hollows to be produced.</p>	Possible	High	Medium	Offset area management	<p>Ecological burns to be undertaken in the [redacted] offset area only in RE's 11.3.4, 11.9.7, 11.10.7 and 11.10.4a to reduce the stem density of the eucalypt vegetation when there is a density of >750 Immature Trees/ha². This is done only to reduce competition for soil resources and therefore promote larger trees becoming established.</p>	Unlikely	Minor	Low
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5-, 10-, 15- and 20-year timeframes, respectively									
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5, 10-, 15- and 20-year timeframes, respectively	Failure to achieve and maintain offset completion criteria	Possible	High	Medium	Offset area management	<p>Implement the management actions of this OAMP.</p> <p>Monitor and report on attainment of interim environmental performance targets and completion criteria.</p>	Unlikely	High	Medium

² Glossary, Accepted development vegetation clearing code, Managing regulated regrowth vegetation, Effective date 7th February 2020; compiled by the Department of Natural Resources, Mines and Energy

7. Offset management measures

The offset area management measures include, but are not limited to, management actions required on the offset sites to abate identified threats to the TEC and species habitats being offset. The offset area management measures provide for the management, reporting, and the monitoring program that will be undertaken until the completion criteria are met. Protection of the offset area will be maintained under the VMA as a Category A area of vegetation (vegetation subject to a restoration order or an offset).

The management actions include:

- Limiting vegetation clearing to only those areas required for maintaining fencing and fire control lines
- Prohibiting alternate land use and activities (e.g. timber harvesting, cropping)
- Restricting unauthorised access
- Excluding domestic livestock from the offset area except for the controlled grazing associated with fuel reduction in specified dry periods
- Controlling feral animals
- Managing fire
- Controlling weeds
- Thinning of areas of high stem density to encourage larger trees and subsequently hollows.

The management schedule describes the actions to be undertaken on the offset site (Table 10).

Regular offset area reports will be prepared by the proponent. These will report against each of the management actions shown in Table 10. These management actions enable the offset site to improve to achieve the performance scores, thus attaining and maintaining the completion criteria required of the offset. The reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the management plan.

Table 10: Management actions, triggers and corrective actions

The management actions shown in this table are consistent with the risks identified in the listing advice, conservation advices, and threat abatement plans in *Table 4*. Actions are applicable to both offset properties unless stated otherwise.

Environmental aspect	Management objective	Management actions	Performance criteria	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective offset management actions	Responsible Person
<i>Degradation of habitat</i>	Achieve the completion criteria and habitat quality improvements for offset values, which include the habitat quality scores in this OAMP	Implementation of the management actions and adaptive management framework as outlined in this OAMP.	Increase the habitat quality scores for each offset value at each habitat quality assessment site based on the results of baseline and subsequent monitoring events to achieve the scores in the completion criteria	Monitoring of offset value habitat quality scores will be undertaken in accordance with <i>Section 9</i> . The results of monitoring events will be compared against the habitat quality scores in the interim performance targets and completion criteria to determine the progress of the offset area and recorded as part of reporting.	Habitat quality scores for interim performance targets are not achieved for one or more offset values by: <ul style="list-style-type: none"> Year 5 Year 10 Year 15 Year 20 	<p>Step 1: Investigate cause of trigger:</p> <ul style="list-style-type: none"> Within one month after detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes. Within two months after detection of the trigger, complete a re-evaluation of the suitability of the relevant management measures in the OAMP. The re-evaluation must identify appropriate corrective actions. <p>Step 2: Implementation of corrective action/s</p> <p>The appropriate corrective actions identified under Step 1 will be implemented as soon as practicable, and in any case within eight months after detection of the trigger. They may include (though are not limited to):</p> <ul style="list-style-type: none"> Third party review of the OAMP to provide input on the effectiveness of the management actions. Increasing the frequency and intensity of pest animal and weed control measures or revising the type of measures to be implemented. For offset values that have not achieved interim performance targets by year 20, for those offset values, the approval holder will obtain advice from senior ecologists and land managers with the aim of identifying appropriate additional management interventions 	AASMC Environment Manager
<i>Habitat or vegetation loss through land clearing or thickening of native vegetation (noting the benchmark large trees/ha) and to reduce the number of immature trees/ha</i>	Maintain the extent of offset value habitat within the offset area	Protection of the offset area via a voluntary declaration under Section 19E and 19F of the VMA, as described in <i>Section 10</i> , to be registered within 12 months of the approval of this OAMP.	No unapproved and/or intentional clearing of vegetation within the offset area, except for clearing that is required for fencing, access, firebreaks and public safety. Ecological thinning may be carried out, but only on and in accordance with the advice of a Principal Ecologist with >15 years' experience in Central Queensland.	Reporting to the Australian Government consistent with any and all EPBC Act approval(s).	Any activities in contravention of the Voluntary Declaration	<p>Step 1: Investigate cause of trigger (e.g. unauthorised access)</p> <ul style="list-style-type: none"> As soon as practicable, and in any case within one month of detection of the trigger, identify appropriate corrective actions. <p>Step 2: Implementation of corrective action/s</p> <ul style="list-style-type: none"> As soon as practicable, and in any case within two months of detection of the trigger, the appropriate corrective actions must be implemented. These may include (though are not limited to) additional fencing and/or signage and security for the offset area. 	AASMC Environment Manager
		<p>Comply with the restrictions on clearing established throughout this OAMP.</p> <p>Construction and maintenance of access tracks, fencing and firebreaks will be undertaken as required to manage the offset sites.</p> <p>If vegetation clearing is required for fencing, access, firebreaks or public safety it</p>	<p>Quarterly inspections will monitor and document if there is evidence of recent forestry or timber harvesting activities.</p> <p>Monthly and quarterly inspections will monitor and document vegetation clearing that has occurred for fire break, access road or fence line maintenance.</p>	<p>Detection of prohibited forestry operations, native timber harvesting or clearing outside of established access tracks, fire control lines and fence lines (existing infrastructure).</p> <p>Trigger for thinning is a minimum density of 750 immature trees/ha</p>	<ul style="list-style-type: none"> Step 1: Upon being notified or becoming aware of prohibited forestry operations, native timber harvesting or clearing outside of existing infrastructure, the Approval Holder is to assess how unauthorised persons accessed the site, review existing access restrictions, and inspect signage and offset area fencing within one fortnight of detection of the clearing. Step 2: All actions required to prevent recurrence of the prohibited clearing will be completed within one month of detection of the clearing. 	Landholder (or suitable qualified person appointed by the Landholder)	

Environmental aspect	Management objective	Management actions	Performance criteria	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective offset management actions	Responsible Person
		<p>must be undertaken in accordance with best practice management methods and any applicable legislative requirements.</p> <p>Thinning via chemical and/or mechanical means, including brushcutter, chainsaw and individual tractor.</p>				<ul style="list-style-type: none"> Thin immature trees to >300 stems/ha. All of the following must be retained: <ul style="list-style-type: none"> A full range of plant sizes and species typical of the <i>regional ecosystem</i> in the area distributed in a pattern that is as natural as possible All <i>mature trees</i> and <i>habitat trees</i> At least 300 <i>immature trees/ha</i>, that are species characteristic³ of the <i>regional ecosystem</i> At least 10% of <i>target low shrub species</i> 	
<i>Degradation of habitat by overgrazing</i>	<p>Ensure that any livestock grazing for fire management and weed control maintains and enhances the ground cover attributes for MNES and does not result in the degradation of habitat and vegetation.</p> <p>Ensure that any livestock grazing for fire management and weed control does not inhibit the recruitment of tree saplings that will in future provide habitat connectivity for greater gliders in the riparian areas of the offset.</p>	<p>Stock will be grazed only when required to reduce dry matter yield (i.e.: when dry matter yield exceeds 1200kg/ha), and only during March – July each year.</p> <p>Riparian zones contain mature trees that provide important habitat for Koala and Glider, key tree species include <i>Eucalyptus tereticornis</i>, <i>E. camaldulensis</i>, <i>E. populnea</i>, <i>Casuarina cunninghamiana</i>, <i>E. coolabah</i>, <i>Melaleuca bracteata</i>, <i>M. viminalis</i>, <i>Livistona</i> spp, <i>Corymbia tessellaris</i>, <i>C. clarksoniana</i>, <i>E. melanophloia</i>, <i>E. platyphylla</i> <i>Angophora floribunda</i> and <i>E. crebra</i>.</p>	<p>Increase the richness and average % cover of native perennial grasses at each habitat quality assessment site based on the results of baseline and subsequent monitoring events.</p> <p>Ongoing emergence of tree saplings and growth in open or disturbed riparian areas. A measure of riparian connectivity will be established in year one and subsequently monitored in years 5, 10, 15 and 20. Locations for connectivity improvement will be identified and monitored,</p>	<p>Habitat quality assessments will be undertaken in accordance with <i>Section 9</i>.</p> <p>These will include assessment of percentage cover of native perennial grasses and emergence of tree saplings.</p> <p>A measure of riparian vegetation connectivity will be established in year one and subsequently monitored in years 5, 10, 15 and 20.</p>	<p>Grazing or trampling of impacts to emerging tree saplings and growth from either cattle or native species.</p> <p>Decrease in or failure to achieve targeted improvements in riparian vegetation connectivity.</p> <p>Detection of stock grazing during the exclusion period.</p> <p>Decrease in the richness and average ground layer cover at one or more habitat quality assessment sites based on the results of baseline and subsequent monitoring events.</p>	<p>Upon becoming aware of prohibited stock grazing or impacts in the offset area, the Land Manager is to remove the stock from the area (if present) and assess the adequacy of fencing within 10 days. The Land Manager is to undertake fence maintenance and repairs to resecure the offset area within 10 days.</p> <p>If detected that grazing is prohibiting sapling survival or leading to a lack of improvement in riparian vegetation connectivity additional measures will be implemented, these may include:</p> <ul style="list-style-type: none"> removal of stock during grazing period additional fencing to protect riparian areas installation of individual tree guards to protect saplings planting of key tree species to supplement sapling recruitment. 	Landholder (or suitable qualified person appointed by the Landholder)
<i>Introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the Biosecurity Act 2014 (Qld)</i>	Manage restricted invasive plant species to reduce degradation of MNES habitat	The primary weed control method for exotic grasses will be grazing by cattle and then maintaining dry matter yields and overall groundcover, which will be undertaken during the dry season (that is, from March to end of July each year).	<p>Weed cover must not exceed 10% cover of the offset area by year 20.</p> <p>No new restricted invasive plants listed under the <i>Biosecurity Act 2014</i> (Qld) are identified at any monitoring site (based</p>	<p>Monitoring of this management action will be undertaken by the Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Weed cover is to be monitored by the same methodology and at the same time as the ground cover measurements.</p>	<p>Pest plants dominate isolated area and or occur in an area greater than 10% of the offset area.</p> <p>A new declared pest weed species is identified at one or more monitoring sites, or opportunistically during</p>	<p>Step 1: Investigate cause of trigger</p> <p>Step 2: Implementation of corrective action(s)</p> <p>Upon being notified or becoming aware of pest plants dominating isolated areas and or occupying greater than 10% of the offset area, the Land Manager is to implement pest control measures within one month. These measures may include, and are not limited to:</p> <ul style="list-style-type: none"> foliar spraying basal bark spraying 	Landholder (or suitable qualified person appointed by the Landholder)

³ The Regional Ecosystem Description Database {REDD} at www.qld.gov.au describes characteristic species for each regional ecosystem.

Environmental aspect	Management objective	Management actions	Performance criteria	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective offset management actions	Responsible Person
		<p><i>Parkinsonia</i> will require foliar spraying or cut stump methods initially.</p> <p>Weed control will be undertaken as early as practicable within the natural regeneration process throughout the offset areas and then periodically as required to treat the weeds at the optimum time in their life cycles to control and minimise the spread of the existing weed species.</p>	on subsequent monitoring events).	<p>Quarterly inspections will observe and record the presence of weeds and success of previously applied weed control measures. The inspection will include before and after photos of the weed control area.</p> <p>Quarterly inspections will be conducted by the Landholder or suitable qualified person appointed by the Landholder to record the ground cover in the offset area.</p>	any site inspection or other monitoring.	<ul style="list-style-type: none"> stem injection cut stump cut and swab stem scraper wick applicators. 	
<p><i>Increased population of feral animals in the offset area. Wild cat, pig and dog populations are prevalent and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment occurs when large numbers of animals congregate in the area.</i></p>	<p>Minimise the introduction of pest animals and control of existing populations of pest animals (wild dogs, pigs, feral cats and foxes) within the offset areas in accordance with the Biosecurity Act 2014 (Qld).</p>	<p>Implement control actions for pest animals.</p> <p>Participate fully in, and cooperate with, any and all regional pest control programs, unless those would otherwise contravene a part of this OAMP.</p>	<p>Detection of twelve or more wild pigs or dogs during any inspection.</p>	<p>Undertake monitoring for pest animals.</p> <p>[Pest animal monitoring sites will be established as part of the year 1 survey and located across the offset area.</p> <p>For pest animals that are cryptic in their behaviour, it is difficult to take exact counts of individuals in order to determine their absolute abundance. Instead, an assessment of abundance through signs, dung and/or track counts will be used to establish a reliable estimate of relative abundance in accordance with Hone (1988), Mitchell and Balogh (2007a) and Engeman et al (2013). Estimates of relative abundance (through signs and/or track counts) will provide an initial baseline pest animal numbers, allowing for an evaluation of the success or otherwise of management programs overtime.]</p>	<p>Any observed or suspected apparent substantial decline in squatter pigeon abundance detected during periodic full bio-condition assessments, or during quarterly site inspections (including site meander survey).</p> <p>Any observed evidence of feral animal increases above the baseline established in Year 1 or notable evidence of severe feral animal damage.</p>	<ul style="list-style-type: none"> Upon being notified or becoming aware of pest animal populations exceeding the threshold, the Land Manager is to implement all necessary or appropriate control measures needed to reduce pest animal populations to below trigger thresholds. The land manager is to have completed implementation of all necessary or appropriate pest control measures within one month. The Landholder may approach neighbouring landowners to discuss the increased pest animal presence and an integrated control program may be developed. If an integrated control program is considered appropriate, the land manager will make best endeavours to reach agreement with neighbouring landowners to implement such a program. If impacts from the pest animal populations have not naturally remediated within six months of completion of implementation of the control measures, the land manager is to undertake and complete all works required to remediate those impacts. 	<p>Landholder (or suitable qualified person appointed by the Landholder)</p>
<p><i>Degradation of habitat by feral pigs</i></p>	<p>Minimise degradation of MNES habitat by feral pigs.</p>	<p>Implement control actions for feral pigs.</p> <p>Participate fully in, and cooperate with, any and all regional pest control programs, unless those would otherwise contravene a part of this OAMP.</p>	<p>Reduction in feral pig abundance from the first year of management.</p>	<p>Monitoring of this management action will be undertaken by the Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will involve traversing the offset area with streams, low lying areas and vehicle access tracks being noted to record the presence of wallow holes, tracks and visual incidents in the offset area. If detected, these areas will be GPS-recorded and photographed and rechecked at the next quarterly inspection.</p>	<p>An increase in feral pig abundance from first year and subsequent monitoring events.</p>		<p>Landholder (or suitable qualified person appointed by the Landholder)</p>

Environmental aspect	Management objective	Management actions	Performance criteria	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective offset management actions	Responsible Person
<p><i>Fire</i></p> <p><i>The impact from uncontrolled fire would be a reduction in groundcover, thinning of the canopy and slowing of the offset site achieving the completion criteria.</i></p> <p><i>Due to the scale of the mapping products, site specific data is not available. Anecdotal evidence from the landholder indicates that unplanned fire results from fire encroaching from adjoining properties.</i></p>	No evidence of unplanned and uncontrolled fire in the offset area	<p>Implement fire management in accordance with requirements in this OAMP.</p> <p>If one or more bushfires are current in the region and considered potentially threatening to the site, coordinate with all relevant fire authorities to determine the appropriate method of protecting the site (if the relevant fire authorities advise against seeking to protect the site from a specific fire, the approval holder may comply with that advice without needing approval or agreement from DAWE).</p> <p>The landholder will maintain firebreaks along all external boundaries of the offset area.</p> <p>Fire control lines must be inspected quarterly. Maintenance must be undertaken as required and at least once every two years.</p> <p>Please note: if fire damages the offset areas, that constitutes an incident for the purposes of <i>Section 9</i>.</p>	Uncontrolled fire does not occur in the offset area. Planned and controlled ecological burns are restricted to <25% of the offset area in any 12-month period.	<p>Monitoring of this management action will be undertaken by the Landholder or suitable qualified person appointed by the approval holder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of wildfire, prohibited burning or Force Majeure events.</p> <p>Quarterly inspections will monitor and document if a prescribed low-intensity ecological burn has occurred, and recorded in the Annual report with the written advice from an ecologist or other suitably qualified person (e.g. Fire Warden)</p> <p>Weed cover is to be monitored by the same methodology and at the same time as the dry matter yield and weed control undertaken post a fire event to ensure weed cover (WoNS) is <10%.</p> <p>Ground cover measurements must be in accordance with Methodology 2B as stated in the <i>Land Manager's Monitoring Guide</i> (Department of Environment and Resource Management, 2010) (DERM)⁴, or any subsequent published version of this document.</p> <p>The approval holder and the land manager will keep themselves informed of any bushfires in the region.</p>	<p>Destruction of, or significant damage to, regrowth or fallen timber.</p> <p>The occurrence of deliberately lit fires.</p>	<p>Step 1: Investigate cause of trigger</p> <ul style="list-style-type: none"> Within one month of detection of the trigger, complete an investigation into the reasons why the fire management measures have resulted in a decrease in habitat quality scores. That investigation must review adherence to the fire management measures and must identify appropriate corrective actions. <p>Step 2: Implementation of corrective action/s</p> <ul style="list-style-type: none"> Corrective action: upon being notified or becoming aware of a prohibited fire in the offset area, the landholder is to reassess and implement new access protocols for any lessees etc., signage and general access within one fortnight. Corrective action: subsequent to any occurrence of fire in the offset area, the Land Manager, Landholder or suitable qualified person appointed by the Landholder will: <ol style="list-style-type: none"> inspect and repair, and widen if necessary, all firebreaks; and reassess fuel load reduction practices; and exclude grazing until the ground cover present at the end of the dry season of that year is at a minimum of 60%. 	Landholder (or suitable qualified person appointed by the Landholder)
<p><i>Offset fails to achieve the interim performance targets and completion criteria within the anticipated 5-, 10-, 15- and/or 20-year timeframes, respectively</i></p>	Achieve the interim performance targets and completion scores at years 5, 10, 15 and 20 years, respectively.	All management actions outlined in in this OAMP will be implemented to ensure that the interim performance targets and completion criteria are achieved.	<p>The interim performance targets are achieved by year 5, 10 and 15.</p> <p>The completion criteria are achieved by year 20.</p>	<p>Monitoring of the offset area will be undertaken in accordance with <i>Section 9</i>.</p> <p>The results of monitoring events will be compared against the interim performance targets and completion criteria to determine the progress of the offset area and recorded as part of reporting.</p>	<p>Interim performance targets are not achieved by year 5, 10 or 15.</p> <p>Completion criteria are not achieved by year 20.</p>	<p>Step 1: Investigate cause of trigger</p> <ul style="list-style-type: none"> Within one month of detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes. This investigation must re-evaluate the suitability of the relevant management measures in the OAMP and must identify appropriate corrective actions. <p>Step 2: Implementation of corrective action/s</p> <p>As soon as practicable, and in any case within eight months of detection of the trigger, complete implementation of the corrective actions identified under Step 1. These may include (though are not limited to):</p>	AASMC Environment Manager

⁴ *Land Manager's Monitoring Guide: Ground cover indicator*, Department of Environment and Resource Management, 2010, Queensland Government, Brisbane, available at <http://qldgov.softlinkhosting.com.au/liberty/opac/search.do#>

Environmental aspect	Management objective	Management actions	Performance criteria	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective offset management actions	Responsible Person
						<ul style="list-style-type: none"> Increasing the frequency and intensity of pest animal and weed control measures or revising the type of measures to be implemented. Modifying the fire management measures, to better support enhancement of offset values. <p>If the investigation under Step 1 recommends changes to the management regime, then as soon as possible, and in any case within six months of detection of the trigger, implement a revised OAMP incorporating those recommended changes.</p>	
Site access	<p>Unauthorised persons, vehicles, and/or stock are prevented from accessing the site, and authorised stock are prevented from incurring during exclusion times</p>	<p>Fences (which are located external to the offset) will be maintained to prevent unauthorised access and to control stock presence.</p> <p>Signs will be erected at all entrances and potential access points to the site stating that access to the site is forbidden.</p> <p>All signs will be erected within 12 months of the approval of this OAMP.</p>	<p>Public access to the offset area is prohibited.</p> <p>Access is restricted to those authorised persons required to undertake actions described in this management plan, including the landholder, and approval holder staff and their contractors and assigns.</p> <p>Fences and signage are erected at all necessary points and kept in good repair throughout the life of the offset.</p>	<p>Monitoring of this management action will be undertaken by the Landholder or suitable qualified person within 3 months of the offset area being legally secured and during quarterly inspections.</p> <p>Quarterly inspections will monitor and document evidence of unauthorised access to the offset area.</p> <p>Quarterly inspections will monitor and document if signage is fit for purpose.</p>	<p>Evidence of unauthorised persons, vehicles, and/or stock is detected at any point.</p> <p>Evidence of stock is detected at any point during exclusion times.</p> <p>Damage is detected to any fence or sign.</p>	<p>For evidence of unauthorised persons, vehicles, and/or stock; or evidence of stock in an exclusion area:</p> <p>Step 1: determine access method</p> <ul style="list-style-type: none"> Upon being notified or becoming aware of prohibited access to the offset area, the Landholder is to reassess access protocols for any lessees etc., signage and general access within one fortnight. Damage to signage will be repaired within one fortnight of noting the damage. If there are areas that have been negatively impacted, the regeneration of those areas will be added to the monitoring sites and monitored during the quarterly inspections. Signage will be repaired and maintained as required by the Land Manager, Landholder or suitable qualified person appointed by the Landholder. 	<p>Landholder (or suitable qualified person appointed by the Landholder)</p>

8. Offset site management and protection additional to those that currently exist

Securing the offset area will add additional protection for biodiversity values from clearing⁵ and provide additional management of weeds and pest animals that are additional to the general requirements for biosecurity.

Prior to legal securement of the land, the offset area will not be protected from timber harvesting, the inappropriate use of hot fires or the under-sowing of exotic pasture species through either the VMA or the EPBC Act due to exemptions within the legislative frameworks for the continuing use of the land. Remnant vegetation areas are protected from broadscale clearing under the VMA, however the clearing of regrowth is permitted. Maintaining the existing condition of regulated vegetation and land for habitat values is not addressed under the VMA.

The Biosecurity Act 2014 (Qld) (the **Biosecurity Act**) imposes a 'general biosecurity obligation' on all Queenslanders to manage biosecurity risks that are under their control and that they know about or could reasonably be expected to know about.⁶ In practical terms, this means that:

- If you are a livestock owner, you are expected to stay informed about pests and diseases that could affect or be carried by your animals, as well as weeds and pest animals that could be on your property. You are also expected to manage them appropriately.
- If you are a landowner, you are expected to stay informed about the weeds and pest animals (such as wild dogs) that could be on your property. You are also expected to manage them appropriately.

The Biosecurity Act assigns the pests identified in the offset areas as Restricted Matters in Categories 3-6 and requires the following management as shown below in Table 11.

Table 11: Biosecurity Act 2014 (Qld) obligations

Category	What is required	Examples
3	Must not distribute, be traded or released into the environment	Most invasive weeds, pest animals, noxious fish
4	Must not move	Certain weeds, pest animals, noxious fish such as feral pigs, feral deer, rabbits, Hudson pear and jumping cholla cactus
5	Must not possess or keep	Rabbits, carp, bunny ears cactus
6	Must not feed (except if undertaking a control program)	Feral deer, wild dogs, rabbits, foxes, noxious fish (tilapia, gambusia)

The obligations in the OAMP are additional to these general obligations. For example, there is a requirement to control wild pigs if numbers in excess of 12 are observed in any one property inspection; this is above and beyond the requirements of the Biosecurity Act, as is the reduction of weed species to 10% of the offset area over the life of the management plan.

The Isaac Regional Council identifies the offset areas as Rural in their planning scheme and offers no protection from the current ongoing land use. The council does not have a Biosecurity Plan and only refers to the Biosecurity Act.

⁵ *Vegetation Management Act 1999* (Schedule definitions)

⁶ See <https://www.daf.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-act-2014/general-biosecurity-obligation>

9. Monitoring and Reporting

The monitoring methods (Table 12) will enable comparative changes in vegetation condition against baseline data collected on the offset site, as well as attainment and maintenance of the offset completion criteria. Furthermore, the monitoring will measure changes resulting from the management actions and variability due to climatic conditions. This will inform the nature and frequency of management actions required and if trigger levels are reached, the use of corrective actions to bring the offset back into compliance.

Note that the methodologies listed, and the regional ecosystem benchmarks used in the establishment of the baseline data, must be used consistently throughout the reporting period to enable the comparison of data.

Suitably qualified and experienced ecologists will be employed to undertake all survey design, ecological monitoring, data analysis and reporting. The landholder or appointed experienced personnel will undertake quarterly inspections and observations of fences, sapling loss, weed and feral animal incursions, dry matter yield estimates and fire risk.

At the completion of each 5 yearly ecological survey, a monitoring report will be published on the Anglo coal website, within 6 months from completing the survey.

Commonwealth threatened species survey guidelines used to inform the requirements of the terrestrial flora and fauna surveys will include:

- Survey guidelines for Australia's threatened birds (DEWHA 2010a)
- Survey guidelines for Australia's threatened mammals (SEWPaC 2011c)
- EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DotE 2014)
- Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (SEWPaC 2011a)
- SPRAT databases for relevant EPBC Act listed species and communities

Table 12: Monitoring schedule and methodology

Monitoring	Attributes monitored	Timing	Method	Location/s
Surveys undertaken by ecologists every 5 years				
Regular inspections and incidental observations of the offset area	Evidence of: unauthorised clearing or timber harvesting; feral animal and weed incursions; observe and record Dry Matter Yields and particular fire risks. Evidence of sapling loss from grazing or trampling in riparian areas, include photo evidence.	Quarterly	The Landholder or a suitably qualified person appointed by the Landholder will undertake quarterly inspections of the offset area. Dry Matter Yields are to be assessed as per the Brigalow Belt pasture photo standards https://futurebeef.com.au/knowledge-centre/brigalow-belt-pasture-photo-standards	Across the offset area
Audit of existing weed infestations	Presence and extent of weed and feral animal presence (baseline)	Year 1 (2025)	Field observation and GPS mapping	Across the offset area
Measure of riparian vegetation connectivity, including spatial representation of connectivity and condition	Identification of areas for improved connectivity of greater glider habitat	Year 1 (2025) 2030, 2035, 2040, 2045 (March – May)	Repeatable method to be developed based on published literature and experienced ecologist input.	Along riparian areas within the offset
Targeted habitat quality assessments of habitat Targeted surveys for koala, greater glider, squatter pigeon and ornamental snake	Nature and quality of habitat attributes for koala and greater glider (i.e. nature and health of koala food trees, shelter for Koalas, presence of hollows and threats such as dogs). Presence of koala, greater glider, squatter pigeon and ornamental snake in the offset area, including estimated numbers and location of sightings and/or signs such as scats.	2030, 2035, 2040, 2045 (March – May)	Survey guidelines for Australia’s threatened mammals (DSEWPC 2011), EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DoE 2014). Survey guidelines for Australia’s threatened mammals (SEWPaC 2011c)	Across the offset area
Ecological condition and relevant habitat features using biocondition assessments	Recruitment of woody perennial species in EDL	2030, 2035, 2040, 2045 (March – May)	Field observations, vegetation assessment as per the <i>BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual</i> (Eyre <i>et al.</i> , 2015b) Data for each of the ecological condition attributes monitored will be collected at fixed survey sites across the offset areas and reported on and presented in a sequential manner (including previous data collected) to quantify change from the baseline condition. This will record the change in each	Fixed survey sites across the offset areas to be established in Year 1.
	Native plant species richness – trees			
	Native plant species richness – shrubs			
	Native plant species richness - grasses			
	Native plant species richness – forbs			
	Tree canopy height			
	Tree canopy cover			
	Shrub canopy cover			
Native perennial grass cover				

Monitoring	Attributes monitored	Timing	Method	Location/s
	Organic litter		<p>attribute measured and hence the condition of the habitat, thus enabling a statistical comparison to previous years'. Scoring is to be consistent with the <i>Guide to Determining Terrestrial Habitat Quality Version 1.3</i> (Department of Environment and Science, 2020).</p> <p>Analysis and reporting will include a specific section on riparian zone condition and improvement as relates to Greater glider habitat features.</p>	
	Large trees			
	Coarse woody debris			
	Non-native plant cover			
	Quality and availability of food and foraging habitat			
	Quality and availability of shelter			
Abundance and trend in pest animal numbers	Feral pigs Wild dogs	Year 1 (2024) Quarterly	<p>Pest animal monitoring sites will be established as part of the year 1 survey and located across the offset area.</p> <p>Feral pig assessments of abundance will be determined in line with methods recommended in Hone (1988), Mitchell and Balogh (2007a) and Engeman et al (2013).</p> <p>These will use:</p> <ul style="list-style-type: none"> • animal counts (if any) • wallows • tracks and other disturbances <p>to establish relative abundance indices in year 1 and subsequent years.</p> <p>Wild dog estimates will be based on animal observations, tracks and evidence of prey kills across the offset area (Mitchell and Balogh (2007a)).</p>	Monitoring locations will be established in Year 1.

Note that the methodologies listed, and the regional ecosystem benchmarks used in the establishment of the baseline data, must be used consistently throughout the reporting period to enable the comparison of data.

9.1. Reporting

Table 13: Reporting schedule

Report Details to Commonwealth Government	Reporting period	Submission due date
<p>Submit an Annual Offset Area Management Report detailing:</p> <ul style="list-style-type: none"> summary of management action implementation and effectiveness details of any triggers for corrective actions and outcome of implementing of corrective actions results of quarterly inspections including weed or pest animal incursions/abundance, unauthorised clearing, fire incidents. 	Annually to cover the period from 1 June to 30 May	30 June each year beginning in 2025
<p>Submit 5 yearly an Offset Condition Report detailing:</p> <ul style="list-style-type: none"> survey sites/photo point (including coordinates), offset condition outcomes, including habitat quality scores, condition of habitat and results of surveys; include specific riparian zone assessment weed and pest animal status over the period effectiveness of management actions 	Initial Offset Area Report - from the date of approval of this OAMP to 30 May 2025 for the first report	30 June 2025 for the first report
	Every 5 years until completion criteria achieved	30 June every 5 years from 2030 until completion criteria achieved
<p>The Annual Offset Area Management Report and 5 yearly Offset Condition Report will be peer-reviewed by a suitably qualified person to determine if the assessment of management effectiveness is appropriate and valid.</p> <p>Peer review will use environmental audit procedures (ISO 14001) to identify if actions, monitoring and reporting is consistent with this Plan and that targets and trigger levels have been appropriately monitored and actioned.</p>	Annually and 5 yearly.	Within 6 months of the report becoming available, beginning in 2025

All reports will be published on Anglo American's external website within one month of submission to the appropriate Australian Government Department.

10. Legally binding mechanism

Within 1 year of this OAMP being approved by the Minister the offset areas will be secured via two Voluntary Declaration (**VDec**) as areas of high conservation value under sections 19F and 19K of the VMA. Once the declaration has been registered on the title, the offset area will be mapped as Category A area on the property map of assessable vegetation (**PMAV**). An area mapped as category A on a PMAV is described as an 'area subject to compliance notices, offsets and voluntary declarations'.

The approved OAMP must be attached to the legal mechanism used to legally secure the environmental offset. The approval holder will notify the Department within 5 business days of the mechanism to legally secure the environmental offset having been executed.

The VDec will remain in place as the legally securing mechanism for the offset area. The VDec and approved OAMP will ensure the offset completion criteria are attained, and then maintained until the completion criteria are achieved.

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