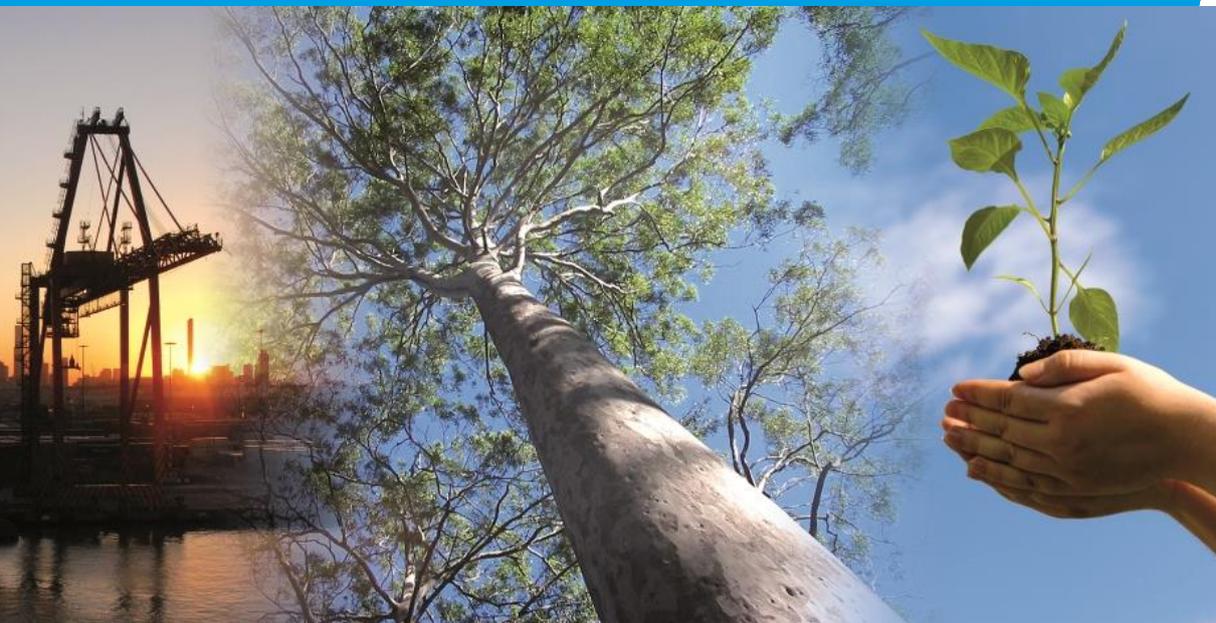


Byerwen Coal Project: Offset Delivery Plan EPBC 2010/5778



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1 EXECUTIVE SUMMARY

The Byerwen Coal Project (the **Project**) has been approved to impact Matters of National Environmental Significance (**MNES**) under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* after all reasonable measures to avoid and minimise disturbance have been taken. The Project will also impact Queensland Government biodiversity values that are addressed under separate reporting and offsets.

The Project impacts for Stage 1 are restricted to Mining Leases (**MLs**) 70434, 70435 and 70436, and 461.2 hectares (**ha**) of vegetation. A summary of impacts to threatened ecological communities (**TEC**) and primary habitat for protected species that are to be offset for Stage 1 are detailed in **Table 1**. Offsets will be delivered in a staged approach and all offsets for Stage 1 will be located on Wollombi Station, Lot 1 on SP278043. The proximity of the Project and Wollombi Station are shown in **Figure 1**.

This Offset Delivery Plan (**ODP**) for Stage 1 of the Project includes several Schedules and Appendices and as a whole the document is the Biodiversity Offset Management Plan (**BOMP**), as prescribed in conditions 5, 6 and 7 of the approval granted under the EPBC Act. The timing of impacts pertaining to Stage 2 and subsequent stages will be determined during the progression of the Project over the fifty-year lifespan. A second BOMP will be submitted to the Minister prior to impacting MNES that must be offset under the EPBC Act approval, and the Minister must approve the BOMP for each stage prior to the impacts to MNES occurring.

The offset achieves ecological equivalence, addresses all matters required, and is strategically located in and adjacent to a Queensland Government recognised ecological corridor.

1.1 Description of Project

The Project involves developing an open-cut coal mine in the northern Bowen Basin and rail facilities leading to the coal export terminal at the Port of Abbot Point. The Project proponent is Byerwen Coal Pty Ltd (**Byerwen Coal**), a joint venture between QCoal Pty Ltd (**QCoal**), which is a Brisbane-based, Queensland-owned and operated coal exploration and mining company and JFE Steel, which is a subsidiary of the JFE Group of Japan.

The proposed mine is located approximately 20 kilometres (**km**) west of Glenden and 140 km west of Mackay. The Project encompasses six ML areas collectively covering circa 20,993 ha (see **Figure 1**). The ML details are as follows:

- 10355 (application);
- 10356 (application);
- 10357 (application);
- 70434 (granted);
- 70435 (granted); and
- 70436 (granted).

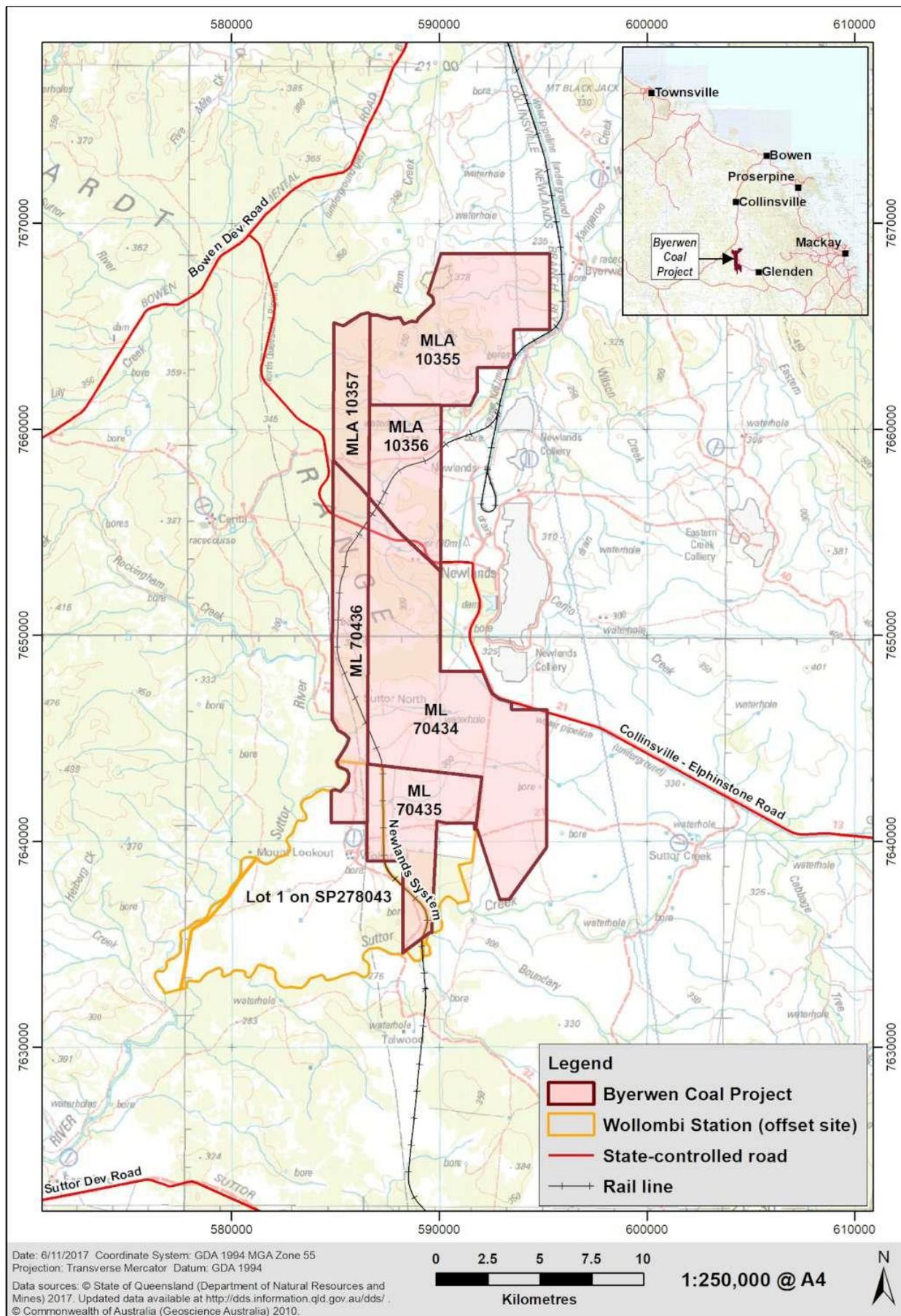
The mine plans to extract high quality hard coking coal for the export market with some thermal coal by-product. Subject to obtaining all necessary approvals, open-cut mining is expected to commence in 2017, with output progressively increasing to a full production rate of approximately 10 million tonnes per annum of product coal for export.

Table 1: Summarised Byerwen Stage 1 impact areas and offset areas

Protected Matter	Status	Impact area (ha)	Habitat Quality Score	Offset Area (ha)	Habitat Quality Score	Regional Ecosystem (RE)	Offset Property
Threatened Ecological Communities							
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered	Polygon 8 (RE 11.3.1): 4.5 ha Polygon 6,7,13,18 (RE 11.4.8): 43.9ha Polygon 11,12,19 (RE 11.4.9): 74.32 ha Total: 122.8 ha	6	Non-remnant Polygons 30 and 32: 165.0 ha Total: 165.0 ha	6	11.4.9	Wollombi Station
Threatened Species							
Primary habitat for the <i>Denisonia maculata</i> (Ornamental Snake)	Vulnerable	Polygon 8 (RE 11.3.1): 4.5 ha Polygons 6, 7, 13, 18 (RE 11.4.8): 43.9ha Polygons 11, 12, 19 (RE 11.4.9): 74.32 ha Polygons 5, 9, 10, 14 (RE 11.4.2): 107.2 ha Total: 229.9 ha	6	Non-remnant Polygons 30 and 32: 165.0 ha Remnant Polygons 39 and 43: 64.9 ha Total: 229.9 ha	6 5	11.4.9 11.4.9±11.4.2	Wollombi Station

Protected Matter	Status	Impact area (ha)	Habitat Quality Score	Offset Area (ha)	Habitat Quality Score	Regional Ecosystem (RE)	Offset Property
Primary habitat for the <i>Geophaps scripta scripta</i> (Squatter pigeon (southern))	Vulnerable	Polygons 1, 2, 3, 4 (RE 11.7.4): 214.8 ha Total: 214.8 ha	7	<i>Remnant</i> Polygons 47, 50, 53, 54: 9.3ha	7	11.3.2	Wollombi Station
				<i>Non-remnant</i> Polygon 31, 34: 89.4ha	6	11.3.2	
				Polygons 45, 46, 55: 96.4 ha	6	11.3.4	
				Polygon 66: 30.3 ha	6	11.4.8	
				Adjacent to Polygons 6 and 7: 47.1 ha	6	11.4.9	
				Polygons 58, 59, 60 (+ south of 60): 116.1ha	6	11.5.3	
				Polygons 41, 56, 57: 29.4ha	6	11.5.9	
				Total: 418.0 ha			

Figure 1: Byerwen Coal Project locality map



1.2 Commonwealth Approval

On 13 January 2011, the Australian Government determined that the Project constitutes a controlled action pursuant to the EPBC Act. The controlling provisions are:

- listed threatened species and communities (EPBC Act, sections 18 and 18A); and
- listed migratory species (EPBC Act, sections 20 and 20A).

An amendment to the EPBC Act in June 2013 resulted in a new controlling provision in the legislation pertaining to water resources and large coal mining development. This controlling provision was subsequently determined to be applicable to the Project.

On 2 October 2014 the Australian Government Department of the Environment (**DoE**) approved all three controlling provisions and conditioned the requirement of a Biodiversity Offset Management Plan (**BOMP**). Several documents comprise the BOMP which has been completed and submitted in accordance with the timeframes specified under the EPBC Act approval conditions.

The approval under the EPBC Act specified the species and communities for which offsets are required.

They are:

- TEC Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC);
- TEC Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT TEC);
- TEC Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (Natural Grasslands TEC);
- primary habitat for the threatened fauna species Ornamental Snake (*Denisonia maculata*); and
- primary habitat for the threatened fauna species Squatter Pigeon (southern) (*Geophaps scripta scripta*).

Stage 1 of the Project will impact Brigalow TEC and primary habitat for the Ornamental Snake and Squatter Pigeon (southern) therefore only offsets for these impacted matters are proposed at this stage and are detailed herein.

1.3 Coordinator General's Approval

On 1 March 2011, the Coordinator-General declared the Project to be a "significant project" requiring an Environmental Impact Statement (**EIS**) under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971 (Qld)* (**SDPWO Act**). Changes to the SDPWO Act now require the Project to be referred to as a 'coordinated project'. The Coordinator-General's report evaluating and approving the Project with conditions was published on 2 July 2014.

Condition 1 of the Coordinator-General's report requires Byerwen Coal to lodge the offset strategy within 60 days of receiving notification of the approval under the EPBC Act and prior to the commencement of construction activities. The offset strategy document reflected the approved status of the Project under the EPBC Act, the amended certified regional ecosystem (**RE**) mapping (completed by the Queensland Herbarium in June 2014) and feedback from the Coordinator-General on the content of the BOS.

Since the approval of the Project and the release of the Coordinator-General's report, the proponent identified areas within three of the MLs (ML 10355, ML 10357 and ML 70436), where no mining or surface operations were planned and excised those areas from the mining leases under the *Mineral Resources Act 1989 (Qld)* (**MR Act**). Consequently, the Project area was reduced from 22,697 ha to the current 20,993 ha. Additionally, a Project footprint change resulted in an application from Byerwen Coal to the Department of Environment and Heritage Protection (**DEHP**) requesting an amendment to the Environmental Authority (**EA**) EPML00595013. This amendment was approved on 29 May 2015. The footprint change was due to the relocation of the

southern infrastructure area to ML 70435 and a rail spur on the western side of the Goonyella-Abbot Point rail line. All figures and calculations in this document reference the current Project area of 20,993 ha and the amended Project footprint.

1.4 Purpose of Offset Delivery Plan

This ODP provides additional information to the preliminary documentation, summary information to the technical reports provided in the ODP Appendices and has been prepared to address the Project's residual significant impacts to MNES that have been verified since the preliminary documentation. The ODP includes several Schedules and Appendices and as a whole the document is the BOMP prescribed in conditions 5, 6 and 7 of the approval granted under the EPBC Act. Condition 7 of the approval prescribes the information that the BOMP must include and a cross-reference to the relevant ODP/OAMP section is provided as follows to assist the DoE's assessment.

Condition number	Condition	Section addressed in documents
5	The approval holder must submit a Biodiversity Offset Management Plan (BOMP) to the Department for the Ministers approval, outlining how offsets to address the residual impacts to Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant, Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions, Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin, the Ornamental Snake (<i>Denisonia maculata</i>) and the Squatter pigeon (southern) (<i>Geophaps scripta scripta</i>), will be managed. The approved BOMP must be implemented.	The BOMP was submitted 30 September 2016 for assessment. DoE provided feedback on the submission and this BOMP was revised. A revision of the BOMP was submitted on 6 November 2017 to incorporate changes to impacts and subsequent increases to offset areas for known habitat for the Squatter Pigeon (southern)
6	The BOMP must be submitted for approval within twelve months after the commencement of construction. Clearing of EPBC Act listed species and communities must not occur until the BOMP is approved by the Minister in writing.	Construction commenced on 8 December 2015 and the BOMP was submitted on 30 September 2016.
7	The BOMP must include, but is not limited to:	
a)	maps of the offset area/s inclusive of the distribution and extent (in hectares) of the EPBC Act listed species and communities to be offset in electronic Geographic Information System format	The offset area for each EPBC Act listed species and community is mapped in Figure 6 of this ODP. Shapefiles (a Geographic Information System format) detailing (i.e. mapping) the offset area location and extent in hectares were submitted on 30 September 2016. Table 1 of this ODP also details the extent in hectares of the offset rea.
b)	evidence that the offsets are consistent with the <i>Departments Environmental Offsets Policy</i> (October 2012)	Section 3 of this ODP describes the impact and offset sites and Tables 6A, 6B and 6C specifically detail how the offsets are consistent with the Department's <i>Environmental Offsets Policy</i> (October 2012) and the associated Offset Assessment Guide. Schedule 3 presents the EPBC Act Offset Assessment Guide inputs and outputs for each offset.

Condition number	Condition	Section addressed in documents
		Section 3.1 of the report completed by Ecological Survey & Management (submitted 30 September 2016) details how the offsets were assessed in accordance with the Department's <i>Environmental Offsets Policy</i> (October 2012).
c)	details of how the offset area/s have been or will be legally secured to provide long-term protection	Section 4 of this ODP describes how the offset will be legally secured under the voluntary declaration process administered under the <i>Vegetation Management Act 1999</i> (VMA) (Qld).
d)	detailed on-ground surveys, complying with relevant survey guidelines, and description of the baseline condition, attributes and values of the offset area/s with respect to EPBC Act listed species and communities	Section 3.1.2 of this ODP details the survey methodology applied for the offset areas. The assessment report completed by Ecological Survey & Management (submitted 30 September 2016) is appended to the Offset Delivery Plan as Appendix A1 and A1a and also details the survey methodology. The attributes and values, including the baseline condition, of the offset area are presented in Tables 6A, 6B and 6C of this ODP. The tables are also included in the OAMP, section 1.5.
e)	management measures (including timing, frequency and longevity) for each of the EPBC Act listed species and communities and other vegetation within the offset area/s with written evidence of input from a suitably qualified expert who has relevant expertise in the management of native vegetation of the Bowen Basin	The OAMP details the offset area management measures in Section 5, Table 8. The table is replicated in this ODP to assist the assessment, refer to Section 5, Table 7. Section 5.1.1 of this ODP details the suitably qualified experts that were consulted as part of preparing the OAMP. The experts' curricula vitae are provided in Appendix C of this ODP.
f)	details of how the management measures align with the relevant Conservation Advice, Recovery Plans and Threat Abatement Plans for the EPBC Act listed species and communities to be offset	Sections 5.1.3 to 5.1.5 details how the management measures align with the relevant Conservation Advice, Recovery Plans and Threat Abatement Plans for the EPBC Act listed species and communities to be offset. The schedule of management actions (Section 5, Table 8 of the OAMP and replicated in this ODP Section 5, Table 7) details how each action aligns with the relevant Conservation Advice, Recovery Plans and Threat Abatement Plans.
g)	discussion of connectivity of the offset area/s with other habitats and biodiversity corridors	Tables 6A, 6B and 6C of this ODP discuss of the connectivity of the offset area with other habitats and biodiversity corridors (refer to 'site context' in the tables).
h)	a description of the risks to the successful implementation of the BOMP, including mitigation measures and residual risk ratings	Section 4 of the OAMP provides an analysis of the risks to achieving the management objectives and outcomes of the BOMP. The analysis details the initial risks, actions taken to minimise each risk,

Condition number	Condition	Section addressed in documents
		<p>statement of the residual risk ratings and remedial actions that are triggered if a risk has not been avoided.</p> <p>Tables 6A, 6B and 6C of this ODP details on the risks specific to each offset area under the attribute 'risk of loss (%) with mitigation and management'.</p>
i)	<p>a monitoring program for the offset area/s which must:</p> <p>i) clearly set out performance indicators and milestones</p> <p>ii) detail how the success of the management measures against the performance indicators and milestones will be measured, recorded and reported</p> <p>iii) include monitoring scope and parameters, timing, frequency, triggers and corrective actions</p> <p>iv) detail how adaptive management strategies will be incorporated</p> <p>v) outline how compliance will be reported</p> <p>vi) detail who will be undertaking monitoring, reporting, review, and implementation of the BOMP (if this person is not the approval holder).</p>	<p>Monitoring frequencies in the offset area are detailed in Section 5, Table 8 'schedule of management actions' of the OAMP. The table is replicated in this ODP to assist the assessment, refer to Section 5, Table 7. The schedule of management actions table captures the monitoring scope and parameters, timing, frequency, triggers and corrective actions of the offset area. Attributes to be monitored and recorded are described in Section 6 of the OAMP.</p> <p>Performance indicators and milestones are detailed in Section 6 Table 9.</p> <p>The success of management measures against the performance indicators and milestones will be measured, recorded and reported at the frequencies detailed in 'monitoring scope, frequency and timing' and the Section 7 Reporting of the OAMP. All reporting detailed in Section 7 of the OAMP is required in order to achieve compliance.</p> <p>The approval holder is responsible for monitoring, reporting, reviewing, and implementation of the OAMP as stated in Sections 5 and 7 of the OAMP.</p> <p>Section 6 Table 10 of the OAMP details the locations of permanent monitoring sites.</p> <p>The Offset Area Report referred to in Table 8 and Table 11 of the OAMP will document the corrective actions that have occurred during the reporting period.</p>

Additionally, the summary below addresses the threats as identified in the squatter pigeon Conservation Advice and relevant Threat Abatement Plans and how they have been addressed in this document.

Document	Key Points	Section addressed in documents
Conservation Advice <i>Geophaps scripta scripta</i> squatter pigeon (southern)	Ongoing vegetation clearance and fragmentation	Table 7B; Forestry and native vegetation - clearing not allowed.
	Overgrazing of habitat by livestock and feral herbivores; trampling of nests by domestic stock	Table 7B; Grazing – not permitted during the wet season or squatter pigeon breeding season; ground cover levels to be monitored and managed as detailed.

Document	Key Points	Section addressed in documents
	Introduction of weeds	Table 7B: Pest plants – reduce to no more than 10% of ground cover as detailed.
	Inappropriate fire regimes	Table 7B; Fire – fire 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.
	Predation by foxes	Table 7B; Pest animals – monitoring and control as detailed.
	Illegal shooting	Table 7B; Access and signage – no access by unauthorised personnel permitted.
Threat Abatement Plan for predation by the European red fox	Predation by foxes	Table 7B; Pest animals – monitoring and control as detailed.

The offset proposed in this ODP will provide environmental benefits to counterbalance the significant impacts of the Project (see **Table 1**) that will remain after measures to avoid, mitigate and manage have been implemented. The offset proposal includes:

- analysis of the likely offset requirements of the Project under the EPBC Act *Environmental Offsets Policy (2012)* (**EOP**);
- assessment of the offsets and process proposed to meet the likely offset requirements of the Project in accordance with the EPBC Act *Environmental Offsets Policy (2012)* and associated *Offsets Assessment Guide (2012)*; and
- determination of the overall suitability of and environmental outcome provided by the offsets proposed.

2 OFFSET REQUIREMENT

Under the EPBC Act *Environmental Offsets Policy (2012)*, consideration of offsets is required for MNES where a residual significant impact is likely to remain after avoidance, mitigation and management measures have been undertaken. For this Project, residual significant impacts are presented for the proposed clearing of the Brigalow TEC and primary habitat for the Ornamental Snake and Squatter Pigeon (southern) within Stage 1.

2.1 Policy Principles

The EPBC Act *Environmental Offsets Policy* sets out eight key overarching principles that must be applied in determining the suitability of offsets and they are summarised as follows:

1. Deliver an overall conservation outcome that improves or maintains viability;
2. Be built around direct offsets but may include other compensatory measures;

3. Be in proportion to the level of statutory protection that applies;
4. Be of a size and scale proportionate to the residual impacts on the protected matter;
5. Manage the risks of the offset not succeeding;
6. Be additional to what is already required;
7. Be efficient, effective, timely, transparent, scientifically robust and reasonable; and
8. Have transparent governance arrangements.

Considering the above policy principles in relation to the estimated offset requirements of the Project, Byerwen Coal has undertaken a suitability assessment across three rural stock grazing properties to identify potential offset sites. Byerwen Coal also considered plans for future use of the properties to minimise the potential for conflicting land use pressures. The preferred area on Wollombi Station was selected for a detailed field assessment to determine offset values.

3 PROPOSED OFFSET

3.1 Overview of Stage 1 Impact Site

The *Byerwen Coal Project Biodiversity Offset Strategy (BOS)* (Earthtrade 2015) presented the likely offset requirements for the Project in consideration of the vegetation assessments that had been completed across the site as an outcome of the Environmental Impact Assessment (EIA) process, which concluded in 2014. This vegetation mapping outcome is presented in **Figure 2**.

Field surveys of the Stage 1 impact area undertaken in September and December 2015 identified discrepancies in the 2014 vegetation mapping. This revised mapping is shown in **Figures 3 and 4**, and **Table 2** provides a summary of the field-validated areas of each remnant regional ecosystem in the Stage 1 impact area.

Six of the surveyed regional ecosystems are listed as endangered (5) or of concern (1) under the VMA and are therefore State Significant Biodiversity Values (**SSBV**). Where a MNES and SSBV are the same ecological value, only an offset under the EPBC Act is proposed. Impacts to two remnant regional ecosystems, 11.4.2 and 11.9.7a, are not captured by the offsets proposed under EOP. Therefore, 107.2 ha of RE 11.4.2 and 15.0 ha of RE 11.9.7a will be offset in accordance with the Queensland Government administering authority. The EPBC Act *Offset Assessment Guide* details the quantum and quality of each impacted TEC and primary habitat area (**Schedule 3**).

Table 2: Field-validated remnant regional ecosystems impacted in the Stage 1 assessment area (September and December 2015)

RE Code	Short Description (Queensland Herbarium, 2015)	VM Status	Biodiversity Status	EPBC Act Status	BVG 1M	Area (ha)
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	Endangered	Endangered	Endangered (Brigalow)	25a	4.5

RE Code	Short Description (Queensland Herbarium, 2015)	VM Status	Biodiversity Status	EPBC Act Status	BVG 1M	Area (ha)
11.4.2	<i>Eucalyptus</i> spp. and/or <i>Corymbia</i> spp. grassy or shrubby woodland on Cainozoic clay plains	Of concern	Of concern	Not listed	17a	107.2
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	Endangered	Endangered	Endangered (Brigalow)	25a	43.9
11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	Endangered	Endangered	Endangered (Brigalow)	25a	74.3
11.7.4	<i>Eucalyptus decorticans</i> and/or <i>Eucalyptus</i> spp., <i>Corymbia</i> spp., <i>Acacia</i> spp., <i>Lysicarpus angustifolius</i> woodland on Cainozoic lateritic duricrust	Least concern	No concern at present	Not listed	12a	214.8
11.9.1	<i>Acacia harpophylla- Eucalyptus cambageana</i> woodland to open forest on fine-grained sedimentary rocks	Endangered	Endangered	Endangered (Brigalow)	25a	0.1
11.9.7a	<i>Eucalyptus populnea</i> woodland on gently undulating to sloping	Of concern	Of concern	Not listed	17a	15.0

RE Code	Short Description (Queensland Herbarium, 2015)	VM Status	Biodiversity Status	EPBC Act Status	BVG 1M	Area (ha)
	plains on fine-grained sedimentary rocks					
11.9.9	<i>Eucalyptus crebra</i> woodland on fine- grained sedimentary rocks	Least concern	No concern at present	Not listed	13c	1.8
Total						461.2

3.1.1 Mitigation

Where practicable, the mine and associated infrastructure has been positioned to avoid or limit impacts to native vegetation, particularly conservation significant vegetation and important habitats. As an indication of the avoidance measures taken in the mine design, the permanent removal of remnant vegetation/REs for Stage 1 of the Project represents 2.19% of the 20,993 ha Project area. The loss of fauna habitat includes the removal of mature vegetation, gilgai associated with the Brigalow TEC and some areas of grassy woodland. A subsequent increase in competition for food and shelter in remaining habitats may follow for a short period until the effects of the changed management actions in the offset area begin to increase the value of that habitat for the species. The Project will reduce the extent of habitat however suitable habitat will be retained within and adjacent to the Project area including the offset area. The offset area is on the same property as part of the Project and is located in an area adjacent to the Suttor River which is considered a superior area with access to permanent water holes.

The Squatter Pigeon (southern) is known to occur in the woodland vegetation communities (RE 11.7.4) in the Project area within 3 km of permanent water (potential breeding and foraging areas). The extent of clearing in this habitat area is 214.8 ha. Brigalow vegetation communities associated with a gilgai influence provide potential habitat for the Ornamental Snake and Stage 1 will impact 229.9 ha of primary habitat. There will be areas retained in the Project area and an offset along the Suttor River as part of the mitigation and offset process. This offset area is a higher quality area of habitat/potential habitat due to its proximity to the river and existing habitat features.

The loss of native vegetation has been reduced through the mine design avoiding key features. The following mitigation measures provided in **Table 3** will assist in ameliorating the impact and avoiding unnecessary clearing. The residual impacts of clearing will be managed through site rehabilitation and offsetting as proposed in this document.

Table 3: Mitigation measures – vegetation clearing

Mitigation Measure	Phase
During the detailed engineering and design phase avoid clearing areas mapped as TEC, wherever possible.	Planning
Where clearing TECs causes a significant impact offsets will be required.	Planning and Operation
Clearing extents will be clearly labelled on site plans and in the field.	Planning and Construction
The Project area will be sequentially cleared, with clearing occurring as operational areas are required. Clearing will aim to direct fauna into adjacent areas of vegetation i.e. clear in one direction and where possible towards retained vegetation.	Construction
Any additional construction areas and construction sites, such as soil stockpiles, machinery/equipment storages and construction camps are to be located within existing cleared areas or disturbed areas to the greatest extent possible.	Construction

3.1.2 Methodology – Field Survey

A seven-day field survey was conducted between and including 24 and 30 August and 5 September 2015. A total of 109 vegetation assessment sites were surveyed in the impact and offset areas comprising: 50 detailed survey plots, 26 Tertiary assessment sites, 33 Quaternary assessment sites and 30 Quaternary photo point sites (see **Appendix A2**: Field Survey Report – Wollombi Station). Further field verification was undertaken of additional areas in December 2015 to enable the design of an offset package that was more sustainable and addressed the Squatter Pigeon offset requirements in a manner to locate as much as possible adjacent to the Suttor River.

To facilitate the assessment of potential offset liability the vegetation communities representative of, or supporting, a significant environmental matter were assessed using the *Guide to determining terrestrial habitat quality: a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy, Version 1.1* (EHP, 2014).¹ This methodology is largely based on the *Ecological Equivalence Methodology (EEM) Version 1: Policy for Vegetation Management Offsets, Biodiversity Offset Policy*² and therefore the data was used to develop an EEM score for each of the remnant regional ecosystems, required under the *Queensland Biodiversity Offset Policy (QBOP)* (DERM, 2011).³ This data is appended to the OAMP (**Schedule 1**).

The composition, structure and remnant status of smaller polygons of remnant vegetation, i.e. too small to undertake a habitat quality plot, were assessed using a combination of tertiary or quaternary level vegetation assessment sites as defined by the Queensland Herbarium's *Methodology for Survey and Mapping of Regional*

¹ <https://www.ehp.qld.gov.au/assets/documents/pollution/management/offsets/offsets-policyv1-1.pdf>

² *Ecological Equivalence Methodology Guideline – Policy for Vegetation Management Offsets, Queensland Biodiversity Offset Policy (version 1)* 3 October 2011, Department of Environment and Resource Management, Queensland Government, Brisbane, available at <http://qldgov.softlinkhosting.com.au/liberty/opac/search.do#>

³ *Queensland Biodiversity Offset Policy (version 1)* 3 October 2011, Department of Environment and Resource Management, Queensland Government, Brisbane, available at <http://qldgov.softlinkhosting.com.au/liberty/opac/search.do#>

Ecosystems and Vegetation Communities in Queensland, Version 3.2 (Neldner et al., 2012).⁴ This data was compared with data collated at the EEM plot(s) in the same vegetation type and a judgement made as to whether the habitat quality score could be applied to this polygon. These habitat quality scores were used as inputs to the EPBC Act *Offset Assessment Guide*.

3.1.3 Methodology - Threatened species habitat assessments and ecological equivalence scoring

The likelihood of occurrence of threatened flora and fauna along with their habitats were assessed through searches of likely habitat as well as opportunistic searches during foot and vehicular traverses. Impacts to MNES were assessed with reference to the EPBC Act EOP and the EPBC Act *Offset Assessment Guide* was used to calculate the offset area required for each MNES.

Impacts to SSBV were assessed largely with reference to the QBOP. In both processes EEM scores and parameters established through field survey were considered when applying quality scores to the impact and offset areas.

This process was applied to the proposed Wollombi Station offset area that was presented in the BOS. The data collected was used to determine the suitability and size of the offset area required to adequately offset impacts to MNES identified in the Stage 1 impact area.

3.2 Amendments to impacts

The BOS assessment of impacts was based on the Queensland Herbarium map amendment issued in June 2014. This map amendment considered selected information from the vegetation assessments completed during the EIA process over the entire 20,933 ha Project area. The Queensland Herbarium did not incorporate all vegetation changes as proposed by Byerwen Coal and differed in opinion on the presence, or absence, of some vegetation communities. Consequently, the finalised map amendment was based on the Queensland Herbarium's best understanding of the regional ecosystems across the Project area.

The field surveys undertaken in 2015 in Stage 1 were intensive, to derive the required habitat quality information for the EPBC Act *Offset Assessment Guide* and definitively determine the offset liability. The 2015 field survey are shown in **Figure 3**. These field surveys identified discrepancies in the mapped vegetation communities presented in the BOS, which was based on the Queensland Herbarium's map amendment, and the actual vegetation communities on the ground. These corrections are described for each TEC/threatened species in the sections below.

Additionally, a polygon of Poplar Box (*Eucalyptus populnea*) woodland on deeply weathered clays derived from basalt (RE 11.4.2) was identified in the centre of the Stage 1 impact area during the 2015 field survey. This polygon was previously mapped as RE 11.8.5. Similarly, vegetation to the immediate east of this polygon was not identified in the BOS but was found to be representative of remnant RE 11.4.2 and RE 11.4.9. These areas provide habitat for the Ornamental Snake and the latter is a Brigalow TEC therefore they are now included in the assessment.

3.2.1 SEVT TEC

The polygon of endangered SEVT RE 11.8.13 mapped in the centre of the Stage 1 impact area was found to be incorrect and instead is representative of endangered RE 11.4.9, which is considered a component of the Brigalow TEC. SEVT REs or SEVT TEC were not present in the Stage 1 impact area.

⁴ Neldner, V.J., Wilson, B.A., Thompson, E.J. and Dillewaard H.A. (2012) *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 3.2*. Updated August 2012. Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane. Available at http://www.ehp.qld.gov.au/plants/herbarium/publications/pdf/herbarium_mapping_methodology.pdf

3.2.2 Brigalow TEC

Under the current conservation advice for Brigalow TEC (TSSC 2013) none of the field-validated polygons of REs 11.3.1, 11.4.8, 11.4.9 and 11.9.1 would satisfy the condition threshold requirement for the patch to support less than 50% of the total vegetative cover of perennial exotic species in any given stratum. However, this Project proposes to offset the impacts to these communities under the EOP. Overall, more Brigalow TEC is present in the Stage 1 impact area than was previously mapped and reflected in the BOS due to the mapping discrepancies noted above. The removal of 122.8 ha of Brigalow TEC will be offset. **Table 4A** provides a description and rationale for the impact site scoring used in the EPBC Act *Offset Assessment Guide* for the Brigalow TEC.

Table 4A: Impact Area EPBC Act Offset Assessment Guide Inputs – Brigalow TEC

Attribute	Value	Rationale/assumption
Impact Area		
Description	122.8 ha	The three TEC REs are 11.3.1, 11.4.8, 11.4.9 and 11.9.1 (Table 1) and are present across several polygons ranging in size from 3.1 ha to 59.9 ha.
Quality (REs 11.3.1 and 11.4.9 were assessed together as these areas of Brigalow TEC had similar characteristics and ecological equivalence score) (78.8 ha)	6/10	Site condition = 2 The overstorey of the vegetation communities is primarily comprised of Brigalow with Belah (<i>Casuarina cristata</i>) and Yellowwood occurring less commonly. The ground cover tended to be dominated by a mixture of exotic pasture grasses, particularly *Buffel Grass (<i>Pennisetum ciliare</i>) and to a lesser extent *Indian Bluegrass (<i>Bothriochloa pertusa</i>) with an average cover of 9.3%. Native grasses and herbs were less frequently encountered and had an average cover of 4.8%. The ground cover in many areas was moderately to heavily impacted through grazing by cattle.
		Site context = 2 A number of the polygons of Brigalow TEC are small and isolated or have a high edge to area ratio. This is particularly the case with the largest polygon that flanks the unnamed creek in the south of the Stage 1 impact area.
		Species stocking rate = 2 RE 11.4.9 comprises the largest polygon of Brigalow TEC at 59.9 ha. The remaining polygons are approximately 5 ha or greater. In total REs 11.3.1 and 11.4.9 account for 78.8 ha of the Brigalow TEC in the Stage 1 impact area.
Quality (REs 11.4.8 and 11.9.1 are considered to have a slightly higher	7/10	Site condition = 3 The overstorey of the vegetation communities is comprised of Dawson River Gum (<i>Eucalyptus cambageana</i>), which represents the ecologically dominant layer (EDL). The

Attribute	Value	Rationale/assumption
ecological equivalence score) (44.0 ha)		ground cover tended to be dominated by a mixture of native grasses with an average cover of 12.6%, and exotic pasture grasses, particularly *Buffel Grass with an average cover of 4.0%. The ground cover in many areas was moderately to heavily impacted through grazing by cattle.
		Site context = 2 One large patch of RE 11.4.8 representing Brigalow TEC is connected with a larger tract of remnant vegetation to the south. Although vegetation clearing for grazing purposes is not a pressure acting on this TEC at this location, the risk of incidences of fire due to increased fuel load in the ground cover layer and continual degradation through cattle grazing are ongoing threats to this community.
		Species stocking rate = 2 A total of 44 ha of RE 11.4.8 and 11.9.1 will be impacted in the Stage 1 impact area.

3.2.3 Ornamental Snake

A substantially smaller area of known Ornamental Snake primary habitat will be impacted due to the mapping discrepancies noted above. The removal of 141.8 ha of primary habitat for the Ornamental Snake will be offset.

A summary of the field-validated areas of each RE impacted in the Stage 1 area is provided in **Table 2**. Six of these REs are listed as endangered or of concern under the VMA and are therefore SSBV. Of these SSBV, four are also MNES (i.e. three form Brigalow TEC and four form primary habitat for the Ornamental Snake and will be offset under the EOP. **Table 4B** provides a description of the rationale for the impact site scoring used in the EPBC Act *Offset Assessment Guide* for the Ornamental Snake primary habitat.

Table 4B: Impact Area EPBC Act Offset Assessment Guide Inputs – Ornamental Snake

Attribute	Value	Rationale/assumption
<i>Impact Area</i>		
Description	229.9 ha	Field-validation of the Stage 1 impact area found that vegetation representing four remnant REs would be considered to provide habitat for the Ornamental Snake. These REs are 11.3.1, 11.4.2, 11.4.8 and 11.4.9 (Table 1). These REs are comprised of a range of polygons ranging in size from 3.1 ha to 66.4 ha. At present some of the polygons within the Stage 1 impact area comprise a ground layer with a perennial weed cover (i.e. exotic grasses) greater than 50%. Gilgai is present throughout most habitat areas, but ranges from

Attribute	Value	Rationale/assumption
		low to moderate quality depending on the extent of thinning and cattle trampling present.
Quality	6/10	<p>Site condition = 2.5</p> <p>The overstorey of the vegetation communities is primarily comprised of Brigalow with Belah and Yellowwood occurring less commonly. The ground cover in many areas was moderately to heavily impacted as a result of grazing by cattle. The majority of RE 11.4.2 did not support gilgai, but in many cases was connected with areas that did, e.g. RE 11.4.9 and contained substantial coarse woody debris. Coarse woody debris in REs 11.3.1, 11.4.8 and 11.4.9 ranged from very low to moderately high.</p>
		<p>Site context = 2.5</p> <p>A number of the polygons of habitat are small and isolated or have a high edge to area ratio. This is particularly the case with the largest polygon that flanks the unnamed creek in the south of the Stage 1 impact area. Continual degradation through cattle grazing are ongoing threats to this habitat.</p>
		<p>Species stocking rate = 1</p> <p>The Stage 1 impact area is within the known distribution of the Ornamental Snake in Queensland, it is known to occur and has been previously recorded in the Stage 1 impact area (Environmental and Licensing Professionals, 2013). It is assumed to be present as potential habitat is available, however, it is not assumed to be present in high numbers.</p>

3.2.4 Squatter Pigeon (southern)

During the September 2015 surveys, the various distributions of least concern RE 11.8.5 previously mapped in the northern portion of Stage 1 were instead found to be representative of least concern RE 11.7.4 and, to a lesser extent, of concern RE 11.4.2 and non-remnant vegetation. Based on the habitat REs described in the BOS and the September 2015 field mapping, the impact area of known Squatter Pigeon (southern) primary habitat was larger than originally identified. Due to an expansion to the waste rock dump in the north-west portion of the Stage 1 impact areas, additional impacts to known Squatter Pigeon (southern) primary habitat have been identified. The removal of 214.8 ha of primary habitat for the Squatter Pigeon (southern) will be offset. The habitat to be impacted is foraging habitat only. This is evidenced in the Ecological Report of September 2016. The impact area is 1.5km to 4.8km from the Suttor River and is regional ecosystem 11.7.4, a dry eucalypt open forest. **Table 4C.1** and **Table 4C.2** provide a description of the rationale for the impact site scoring used in the EPBC Act *Offset Assessment Guide* for the Squatter Pigeon (southern) primary habitat.

Table 4C.1: Impact Area (141.8ha) EPBC Act Offset Assessment Guide Inputs – Squatter Pigeon (southern)

Attribute	Value	Rationale/assumption
Impact Area		
Description	141.8 ha	<p>The project BOS considered the distributions of all polygons of REs 11.3.2 and 11.7.4 (Figure 2) throughout the Stage 1 impact area as Squatter Pigeon (southern) habitat. Field-validation of these areas found that RE 11.3.2 was not present however a larger area of 11.7.4 was present (Figure 3).</p> <p>The field-validated area of impacted Squatter Pigeon (southern) habitat in the Stage 1 impact area is connected to larger tracts of remnant vegetation to the north and west. Connectivity of habitat immediately to the south and south-east is limited as these areas have been cleared of remnant vegetation. This cleared area is up to approximately 7 km in width in some areas between the Squatter Pigeon habitat and other remnant polygons to the south. The Squatter Pigeon habitat is directly connected by remnant vegetation with the Suttor River (fifth order watercourse) state and regional corridor, approximately 1.6 km to the west.</p>
Quality	7/10	<p>Site condition = 3</p> <p>The overstorey of the vegetation communities are dominated by a variety of <i>Eucalyptus</i> and <i>Corymbia</i> species including Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Poplar Box (<i>Eucalyptus populnea</i>), Ironwood (<i>Acacia excelsa</i>), with <i>Erythroxylum</i> (<i>Erythroxylum australe</i>), Leichhardt Bean (<i>Cassia brewsteri</i>) and Quinine Tree (<i>Petalostigma pubescens</i>). The ground cover tended to be dominated by a mixture of exotic pasture grasses, particularly *Buffel Grass and *Indian Blue Grass. Native grasses include <i>Aristida</i> sp., Dark Wiregrass (<i>Aristida calycina</i>), Jericho Wiregrass (<i>Aristida jerichoensis</i>), Pitted Bluegrass (<i>Bothriochloa decipiens</i>). The ground cover in many areas was moderately impacted through grazing by cattle, which greatly reduces the amount of cover provided to the Squatter Pigeon (southern). However, these communities exhibited relatively low exotic grass cover and shrub cover was high in these polygons and they would provide suitable breeding and foraging habitat. A second order ephemeral stream and dam is located approximately 500 m to the south of RE 11.7.4 (Figure 3).</p> <p>Site context = 3</p> <p>Large tracts of remnant vegetation occur to the north and west of the Squatter Pigeon (southern) habitat. However, expanses of cleared land occur to the south and south-east The Stage 1</p>

Attribute	Value	Rationale/assumption
		<p>impacted area is within 500 m of permanent and seasonal drainage lines and within 3 km of the Suttor River to the west. Easement clearing for existing water and gas pipelines is also present, particularly in a north-south direction between parts of the habitat and the Suttor River, however, the extent of fragmentation in this northern area is not substantial and would not be an impediment to the species' movement across the larger remnant landscape.</p>
		<p>Species stocking rate = 1</p> <p>The Squatter Pigeon (southern) was recorded regularly from the Stage 1 impact area during both the EIS surveys (Environmental and Licensing Professionals, 2013) and the recent assessment of habitat condition in September 2015. Seven records of the Squatter Pigeon (southern) were returned from a Wildlife Online search of the impact area and a surrounding 25 km area. Though no evidence of feral cat or fox were observed in the impact area, it is considered likely that they occur within the broader landscape. The feral dog, cat or fox is therefore likely to exert some predation pressure on the Squatter Pigeon (southern).</p>

Table 4C.2: Impact Area (73ha) EPBC Act Offset Assessment Guide Inputs – Squatter Pigeon (southern)

Attribute	Value	Rationale/assumption
<i>Impact Area</i>		
Description	73 ha	<p>The Squatter Pigeon (southern) habitat to be impacted by the extended waste rock dump is foraging habitat only, as indicated in the Ecological Report of September 2016. The impact area is 1.5km to 4.8km from the Suttor River and is Regional Ecosystem (RE) 11.7.4, a dry eucalypt open forest.</p> <p>The additional areas of 11.7.4 for the expansion of the waste rock dump, in the north-west portion of the Stage 1 impact areas, are included in (Figure 3).</p>
Quality	7/10	<p>Site condition = 3</p> <p>The overstorey of the vegetation communities is dominated by a variety of <i>Eucalyptus</i> and <i>Corymbia</i> species including Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Poplar Box (<i>Eucalyptus populnea</i>), Ironwood (<i>Acacia excelsa</i>), with <i>Erythroxylum</i> (<i>Erythroxylum australe</i>), Leichhardt Bean (<i>Cassia brewsteri</i>) and Quinine Tree (<i>Petalostigma pubescens</i>). The ground cover tended to be dominated by a mixture of exotic pasture grasses,</p>

Attribute	Value	Rationale/assumption
		<p>particularly *Buffel Grass and *Indian Blue Grass. Native grasses include <i>Aristida sp.</i>, Dark Wiregrass (<i>Aristida calycina</i>), Jericho Wiregrass (<i>Aristida jerichoensis</i>), Pitted Bluegrass (<i>Bothriochloa decipiens</i>). The ground cover in many areas was moderately impacted by cattle grazing, which greatly reduces the amount of cover provided to the Squatter Pigeon (southern). However, these communities exhibited relatively low exotic grass cover and shrub cover was high in these polygons and they could provide suitable breeding and foraging habitat. A second order ephemeral stream and dam is located approximately 500 m to the south of RE 11.7.4 (<i>Figure 3</i>).</p> <p>Site context = 3</p> <p>Large tracts of remnant vegetation occur to the north and west of the Squatter Pigeon (southern) habitat. However, expanses of cleared land occur to the south and south-east. The Stage 1 impacted area is within 500 m of permanent and seasonal drainage lines and within 3 km of the Suttor River to the west. Easement clearing for existing water and gas pipelines is also present, particularly in a north-south direction between parts of the habitat and the Suttor River, however, the extent of fragmentation in this northern area is not substantial and would not be an impediment to the species' movement across the larger remnant landscape.</p> <p>Species stocking rate = 1</p> <p>Squatter Pigeons (southern) have been recorded in pairs or small flocks.</p> <p>The Squatter Pigeon (southern) was recorded regularly from the Stage 1 impact area during both the EIS surveys (Environmental and Licensing Professionals, 2013) and the recent assessment of habitat condition in September 2015. Seven records of the Squatter Pigeon (southern) were returned from a Wildlife Online search of the impact area and a surrounding 25 km area. Though no evidence of feral cat or fox were observed in the impact area, it is considered likely that they occur within the broader landscape. Feral dogs, cats and/or foxes are therefore likely to exert some predation pressure on the Squatter Pigeon (southern).</p>

Figure 3: Field verified vegetation mapping in the impact area, September 2015

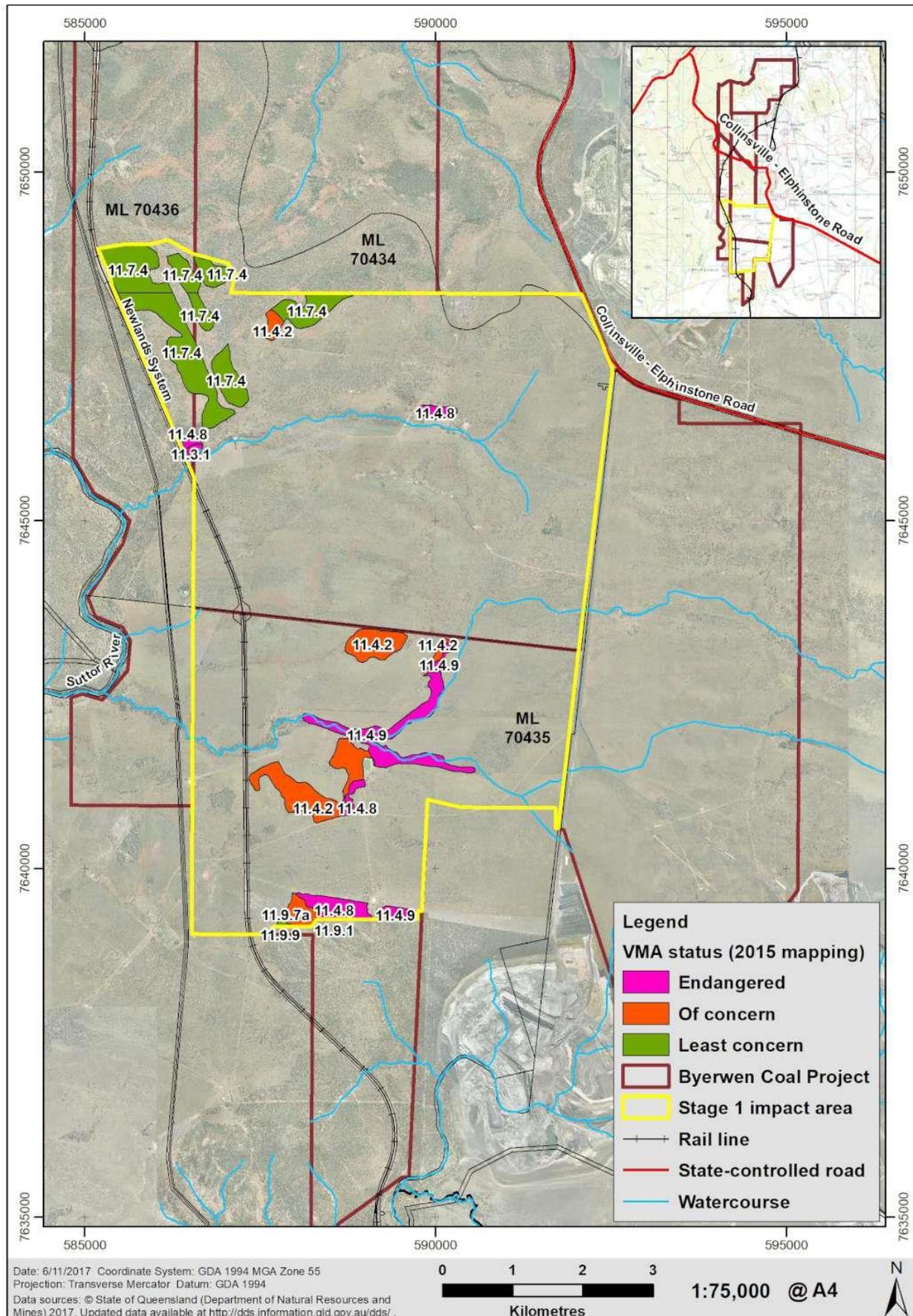
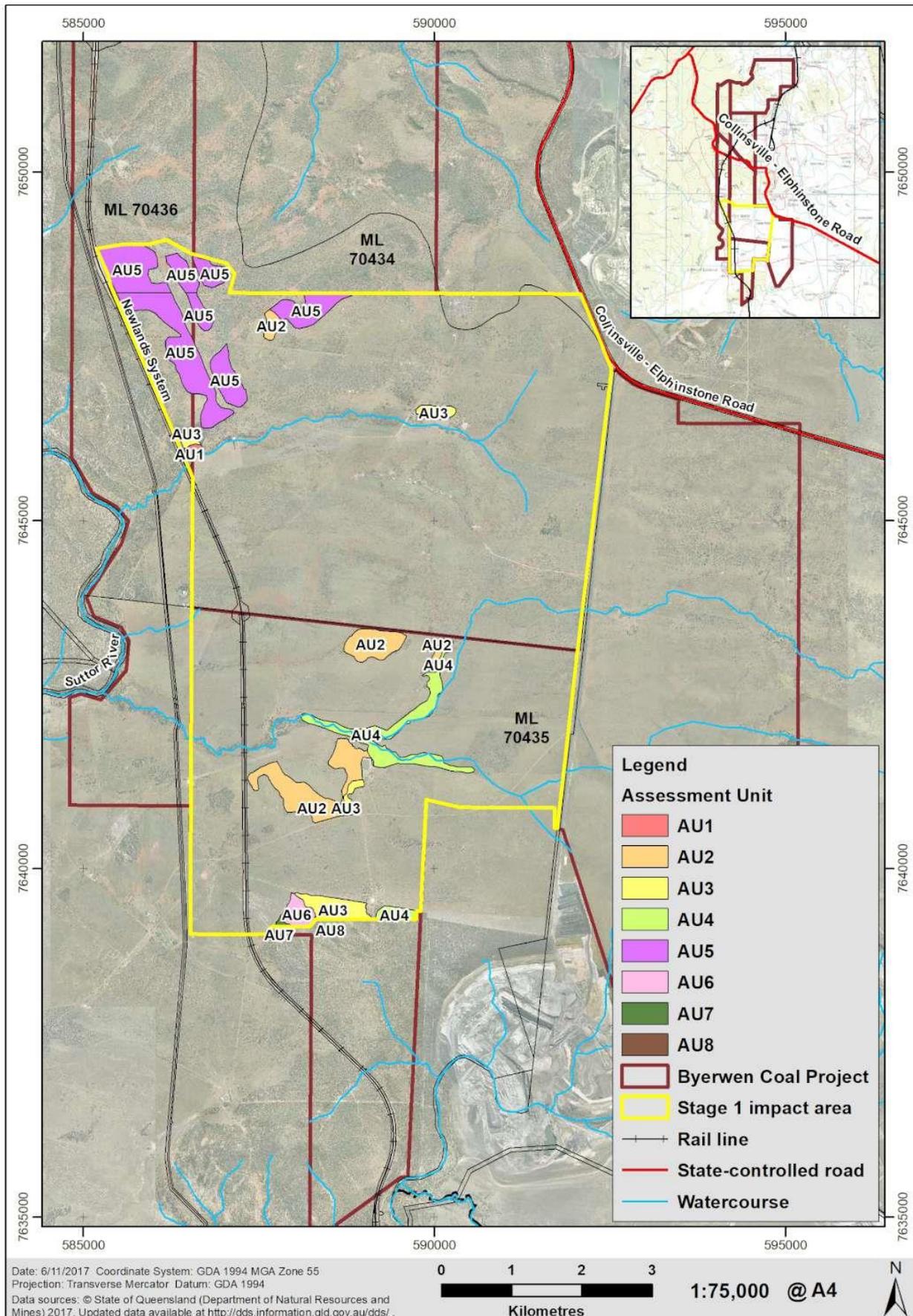


Figure 4: Assessment Units in the Stage 1 impact area, September 2015



3.3 Overview of Offset Property – Wollombi Station

3.3.1 Offset Site – General Description – Wollombi Station

Wollombi Station is 9,831 ha in area with the western boundary being formed by the Suttor River and the southern boundary being formed by Suttor Creek, both of which are stream order 5 watercourses.

The property lies within the Northern Brigalow Belt Bioregion and the region could be considered semi-arid in climatic terms given that the majority of the rainfall falls within the summer period between November and February with evaporation rates exceeding precipitation in a majority of months.

The property is a large-scale grazing operation with the Byerwen Coal Project being located in the north-eastern third of the property. Cattle grazing and associated land management activities are the primary land uses on the Wollombi Station property. Cattle grazing is intensive in the proposed Wollombi Station offset area resulting in the poor condition that is reflected in the EEM scores. Cattle grazing can result in a continual degradation of the understorey and native grass cover and other ground cover. Soil compaction, trampling, erosion associated with cattle tracks, predation of palatable native shrubs, herbs and grasses along with the spread of exotic grasses and weeds are the main threats to the natural integrity of the offset areas. A continuation of the existing land management practices will result in the continued decline in condition of these areas.

All existing easements relative to the offset site have been mapped and excluded from the offset area calculations. No other permanent access tracks are to be established within the offset area.

Table 5: Property details of the offset site

Property name:	Wollombi Station	Real property description	Lot 1 on SP278043
Tenure:	Leasehold	Primary LGA:	Isaac Regional Council
Planning Scheme Zone:	Rural	Property area (ha):	9831.56 ha
		Offset Area (ha):	536.1 ha
Landzone / geology	<p>Landzone 3 - Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence. Includes a diverse range of soils, predominantly Vertosols and Sodosols.</p> <p>Landzone 4 - Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. Excludes clay plains formed in-situ on bedrock. Mainly Vertosols with gilgai microrelief, but includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.</p> <p>Landzone 5 - Tertiary-early Quaternary extensive, uniform near level or gently undulating plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes recent Quaternary alluvial systems (land zone 3), exposed duricrust (land zone 7), and soils derived from underlying bedrock (land zones 8 to 12). Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.</p>		
Soils	Mainly Vertosols and Sodosols		
Pre-clear RE	11.5.3, 11.3.27b, 11.4.11, 11.5.9, 11.4.4, 11.3.7, 11.3.2, 11.4.9		
Existing vegetation	<p>Remnant 11.4.9, 11.4.2, 11.3.2</p> <p>Non-remnant 11.4.9, 11.3.2, 11.5.3, 11.5.9</p>		
Estimated age of vegetation	Remnant – minimum of 25 years, regrowth – minimum of 8 years		
	Yes	Legally Binding Mechanism	

<p>Is there a PMAV currently over all or part of the property?</p>	<p>PMAV number 2008/00679</p>	<p><input checked="" type="checkbox"/> Voluntary Declaration (<i>Vegetation Management Act 1999</i>) <input type="checkbox"/> Covenant (<i>Land Act 1994/Land Title Act 1994</i>) <input type="checkbox"/> Nature Refuge (<i>Nature Conservation Act 1992</i>) <input type="checkbox"/> Other</p>
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Figure 5: Field verified vegetation mapping – Wollombi Station investigation area

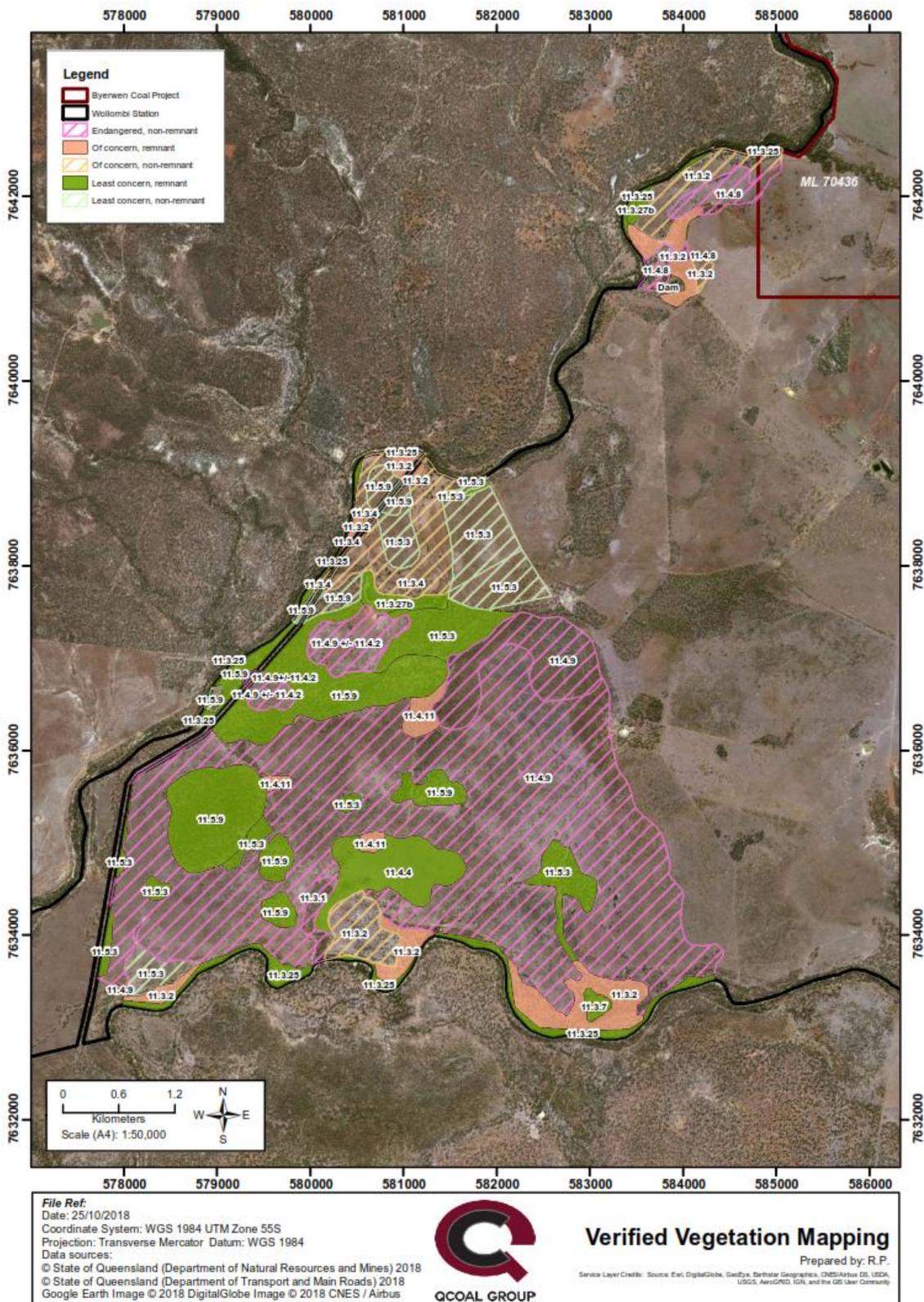
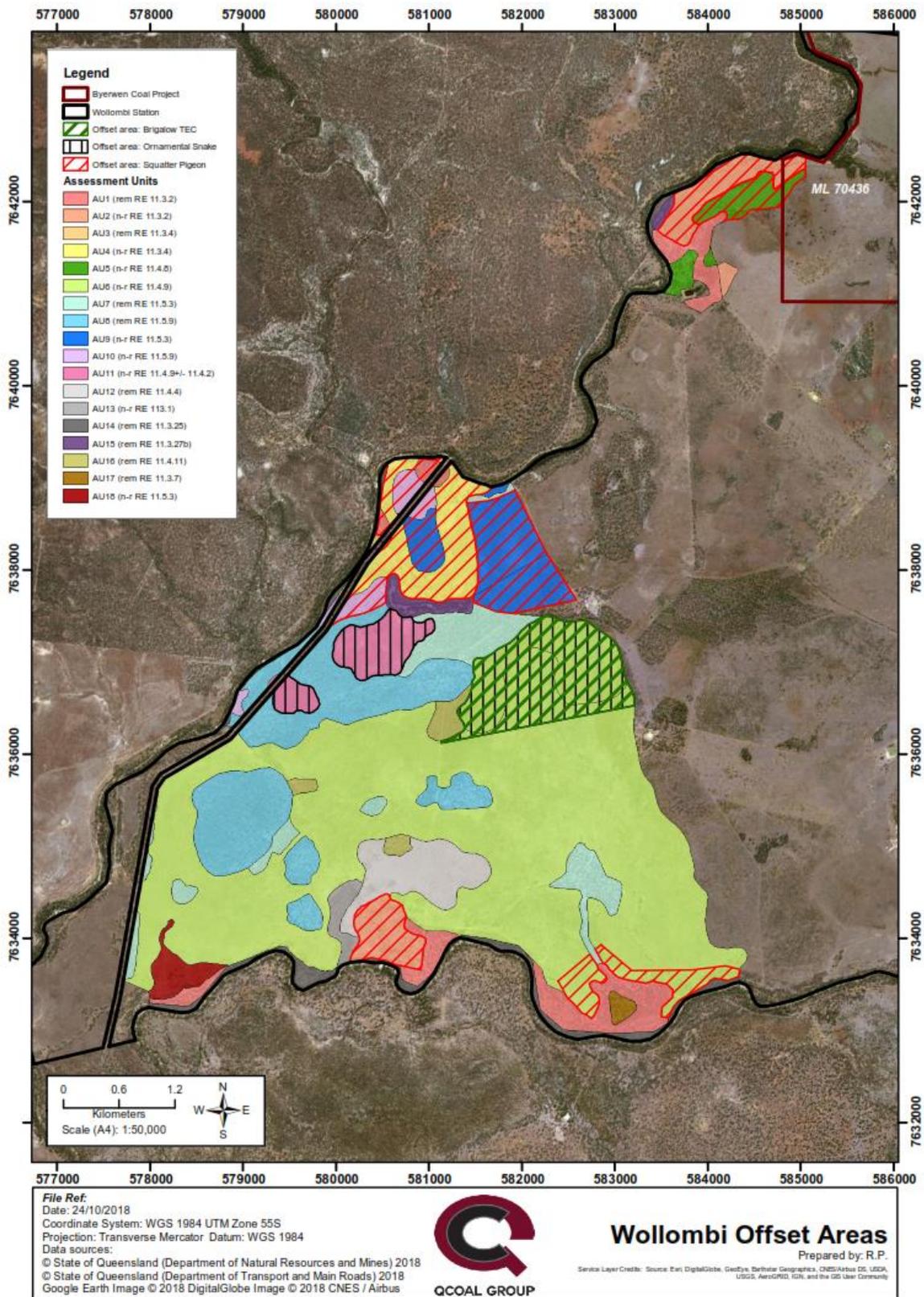


Figure 6: Assessment Units and MNES offsets in the Wollombi investigation area



3.3.2 Offset Site – Clearing/Development History

Significant development on Wollombi Station was undertaken during the Brigalow Development Scheme particularly between the years of 1966 and 1975. **Plate 1** (1959) illustrates the extent of vegetation on the offset area at that time whereas **Plate 2** and **Plate 3** (1970 and 1971) illustrates the pasture development achieved as a result of clearing undertaken in that area as part of the station's initial development. The re-clearing of regrowth after the initial development phase is part of the recognised and regionally accepted practice for maintaining a grazing enterprise in Central Queensland and the Brigalow Belt. This is evidenced in **Plate 4** (1983) demonstrating regrowth and **Plate 5** (2000) which shows the retreatment/clearing of this regrowth. As such, the cycle of woody vegetation control via chaining, the use of fire and the subsequent over-sowing with buffel pasture is the cycle that is being interrupted with the establishment of the offset.

Over the last 18 years regrowth was re-cleared (i.e., with the clearing methodology of utilising two bulldozers and a chain) and then over-sown with exotic pasture grass. The subsequent clearing cycle has been to re-chain and burn every seven to eight years, guided by seasonal conditions. The regrowth areas were programmed to be re-cleared in the last 5 years however the landowner has declined the manager's requests to date in recognition of the potential use of the area for offsets.

Plate 5 demonstrates the cleared nature of the offset site at time of introduction of the EPBC Act in 2000 and the intent to continue maintenance of this pasture state is further demonstrated by the letter from Lane Infrastructure (the pastoral managers for Wollombi Station) dated 12/09/2016 to the owner to re-clear. This is within the rights of the land manager under Division 6 "*Actions with prior authorisation*" of the EPBC Act.

3.3.3 Continuing Use and Prior Authorisation

Sections 43A and 43B of the EPBC Act exempt certain actions from the assessment and approval provisions of the EPBC Act. They apply to lawful continuations of land use that commenced prior to 16 July 2000 or actions that were legally authorised prior to 16 July 2000, the date of implementation of the EPBC Act.

These exemptions allow for the continuation of activities that were fully approved by state and local governments before the EPBC Act came into force ("prior authorisation"), or otherwise lawful activities commenced before the EPBC Act coming into force, and which have continued without substantial interruption ("*continuing uses*").

Continuing use

Under the continuing use exemption, assessment and approval under the EPBC Act is not required if:

- the action commenced before 16 July 2000; and
- the use of land, sea or seabed was lawful; and
- the action has continued in the same location without enlargement, expansion or intensification.

Historical clearing of the land, and any subsequent re-clearing or management, is considered lawful under the federal legislation. Without the land being earmarked for offsets, the cycle of clearing, burning and oversowing of improved pasture grasses (particularly buffel grass) would have been undertaken again in 2016. This management action would in turn allow for an increase in the carrying capacity for cattle and, in turn an increase in grazing pressure on the land. This desire for action has been driven by increasing beef commodity prices and a break in the drought during the majority of the 2000s.

Plate 1: Aerial photo dated 2 July 1959 (note – all plates orientated to the north)



Plate 2: Aerial photo dated 24 November 1970

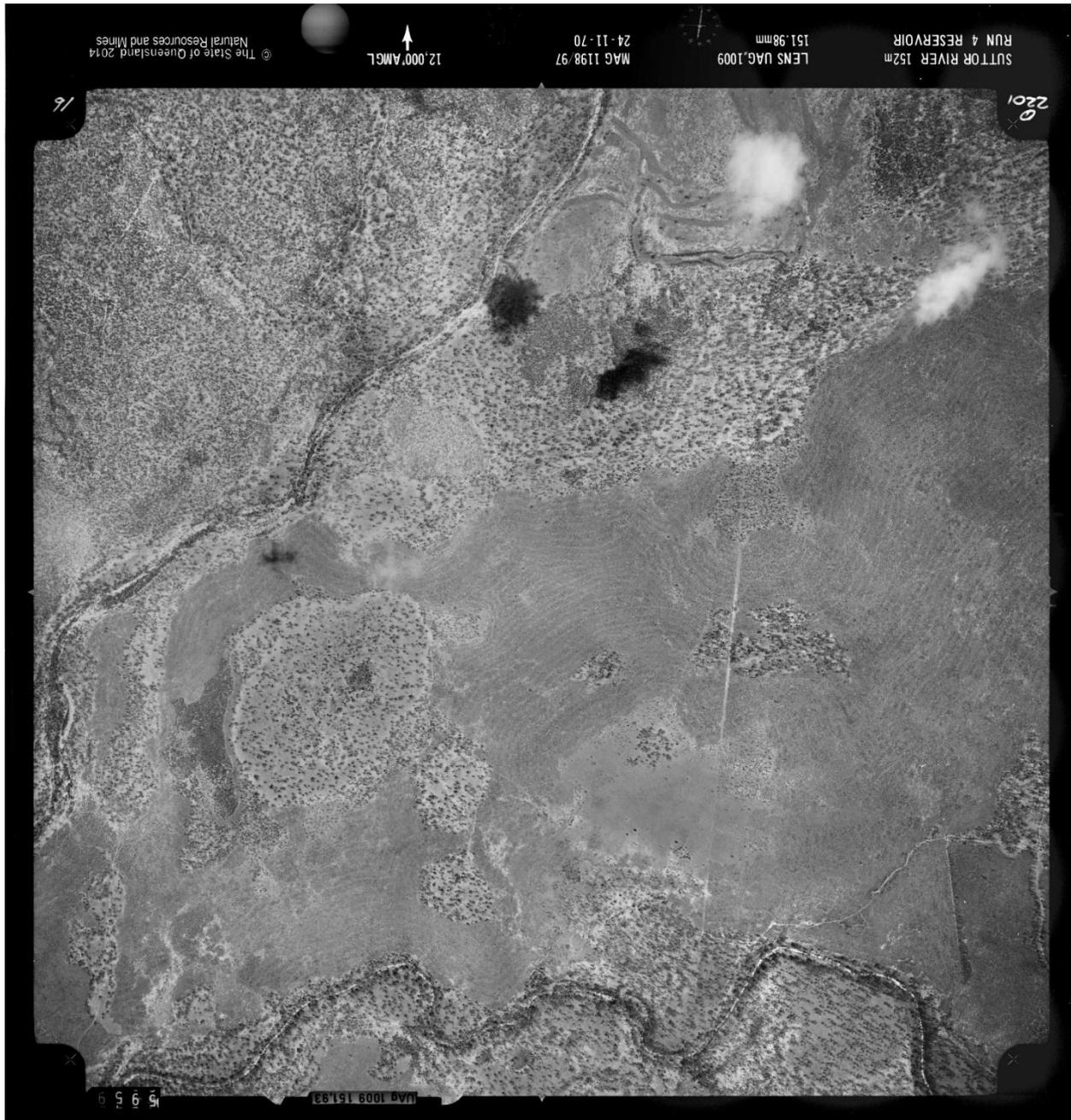


Plate 3: Aerial photo dated 1 June 1971

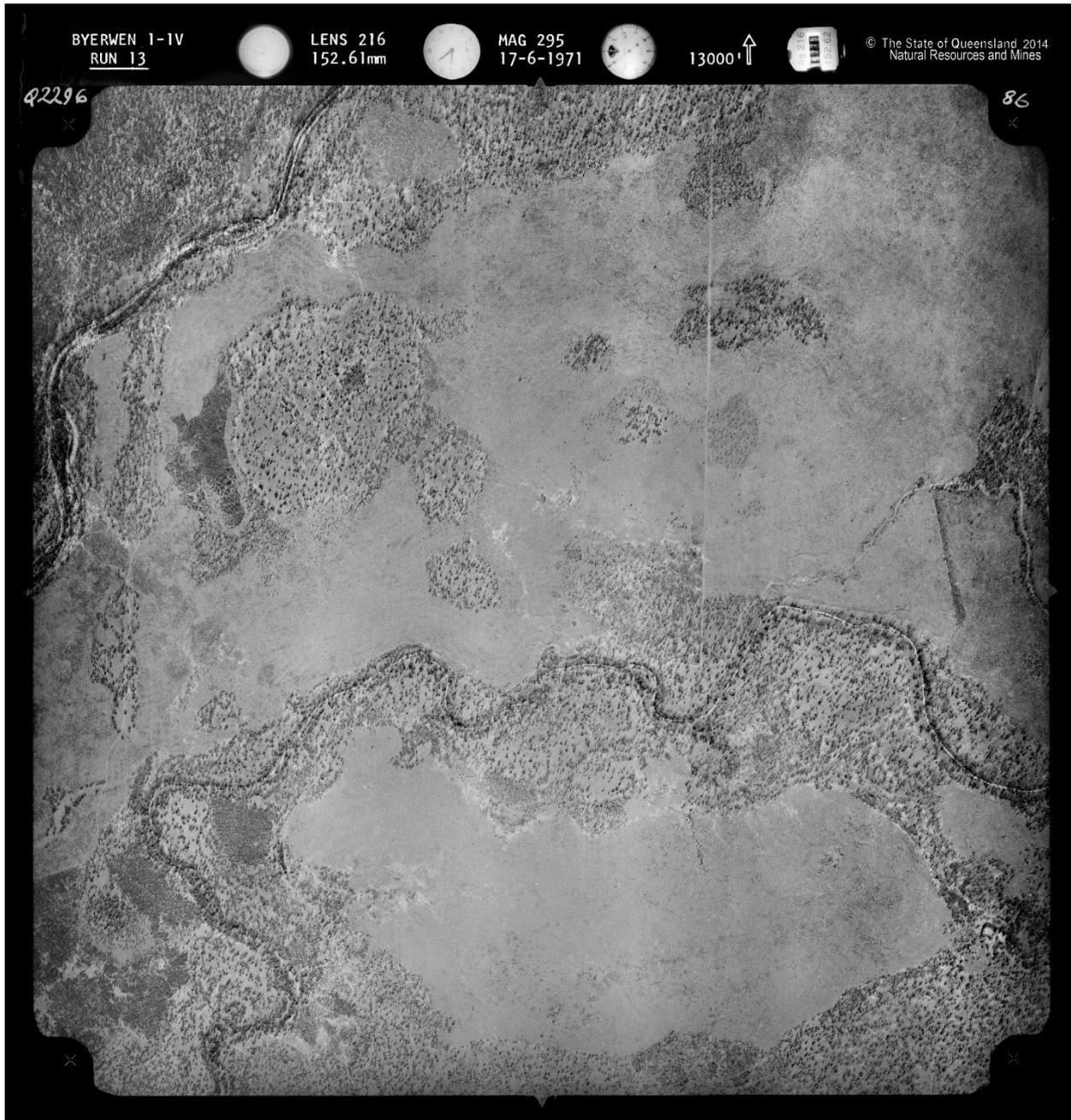


Plate 4: Aerial photo dated 1 June 1983

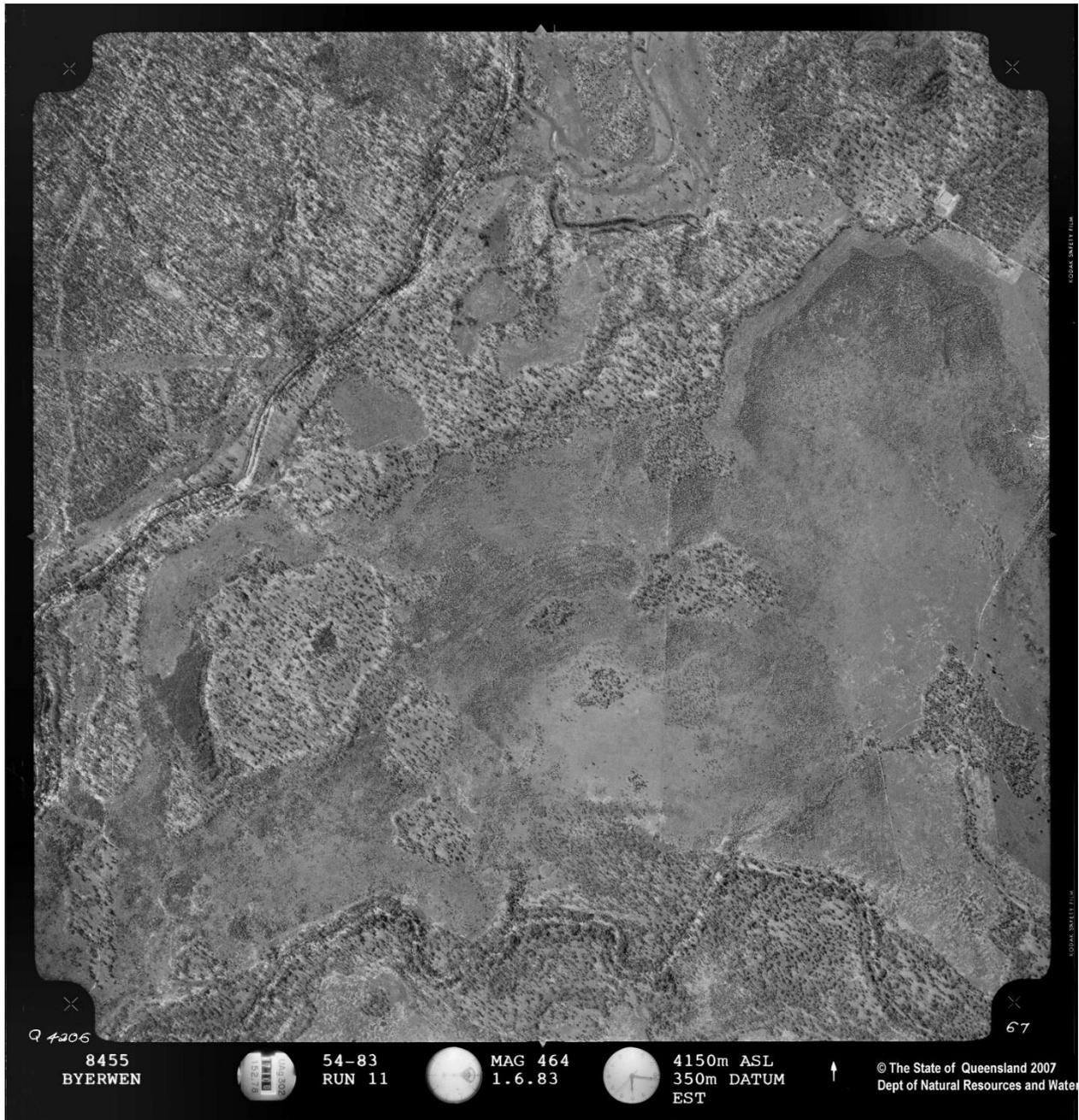
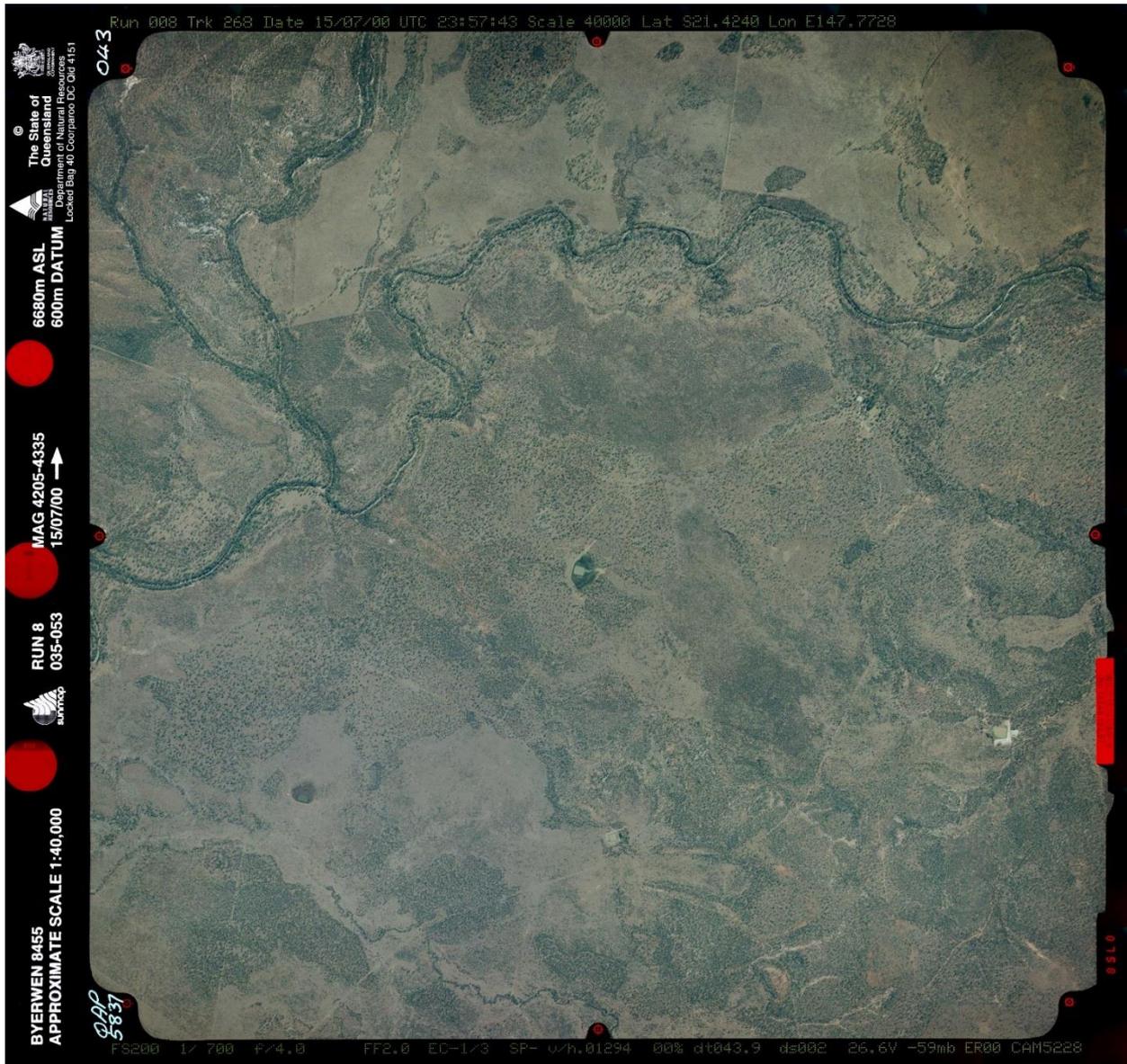


Plate 5: Aerial photo dated 3 June 2000



3.3.4 Mapped Vegetation

The field-validated area of Wollombi comprised remnant and non-remnant areas is illustrated in **Figure 5**. This section of the property assessed and proposed as the offset site is bordered on the west by the Suttor River and to the south by Suttor Creek, both fifth order watercourses (**Figure 5** and **Figure 6**).

3.3.5 Site Surveys and Results

Detailed habitat quality plots were sited in each of the regional ecosystems in the offset area and tertiary and quaternary sites were used to assess smaller polygons to determine if the same habitat quality scores could be applied to those areas. For the purposes of analysis each of the regional ecosystems identified in the offset areas has been assigned an assessment unit number (AU) and each AU consists of one or more polygons of vegetation of the same RE (see **Figure 6**).

Detailed information collected at each ecological equivalence methodology (EEM) plot was supplemented with data collected at tertiary and quaternary sites. This comprehensive data was utilised to develop the scores used in the EPBC Act *Offset Assessment Guide*. This data is appended to the OAMP (**Schedule 1**).

Table 6A, **Table 6B** and **Table 6C** provide a description and rationale for the offset area scoring used in the EPBC Act *Offset Assessment Guide* for the MNES impacted.

3.3.6 Brigalow TEC - Site Surveys and Results

Table 6A shows the description and rationale for the offset area scoring used in the EPBC Act *Offset Assessment Guide* for the impacted MNES Brigalow TEC.

Table 6A: Offset Area – EPBC Act Offset Assessment Guide Inputs - Brigalow TEC

Attribute	Value	Rationale/assumption
Offset Area		
Description	165.0 ha (non-remnant RE 11.4.9)	The offset area is situated adjacent to a 3.6 km stretch of the Suttor River riparian corridor. The offset area is approximately 4 km south-west of the Stage 1 impact area, and connected to other extensive tracts of remnant vegetation to the south, west and north-west and framed by the Suttor River to the north and Suttor Creek to the south. The offset area is connected to the Stage 1 impact area via vegetation along the Suttor River. The offset area also provides habitat for the Ornamental Snake as well as potential dispersal habitat for the Squatter pigeon. The characteristics of the offset area, particularly polygon 32, are considered to present opportunity for substantial improvement in condition of the Brigalow vegetation due to the low-lying position of the vegetation in the landscape and moist condition of the ground layer.
Time over which loss averted	20 years	A legally binding mechanism will be established for the offset area providing protection and management for the term of the management plan.
Time until ecological benefit	10 years	Ecological benefit will principally be achieved through the prevention of clearing, management of cattle grazing, appropriate management of fire regime, management of feral

Attribute	Value	Rationale/assumption
		<p>animals (particularly feral pigs) and control of weeds. These management actions will improve the cover of native grasses and/or sedges and other hydrophilic vegetation that is prevalent in the gilgai areas (e.g. <i>Eleocharis spp.</i>) through reduced soil compaction, trampling and predation that is associated with cattle grazing. These benefits are likely to be realised in approximately 5-10. Reduced grazing pressure will also have the benefit of reduced soil compaction and trampling, which will provide more favourable conditions for recruitment.</p>
<p>Start quality (non-remnant RE 11.4.9, polygon 32 and part of polygon 30)</p>	<p>5/10</p>	<p>Site condition = 1.5</p> <p>The offset vegetation is represented by non-remnant RE 11.4.9 (polygon 32 and part of polygon 30, which is dominated by Brigalow. A high proportion of the ground cover layer is comprised of native sedges. In polygon 32, native ground cover accounted for 37.7% average vegetative cover, while exotic vegetative cover was 5.5%. *Buffel Grass is more prevalent in polygon 30 and in conjunction with *Indian Bluegrass has an average cover of 21.0% compared with the average cover of native grasses, which is 4.8%.</p> <p>The vegetation is non-remnant, although there is recruitment of key species, including Brigalow. Species richness is above average. There are large areas of low exotic grass cover, particularly in polygon 32. The moist condition of the ground layer across large sections of this offset area impede *Buffel Grass growth to the extent that it does not readily outcompete native cover.</p> <hr/> <p>Site context = 1.5</p> <p>The offset area is connected with other large tracts of remnant and non-remnant vegetation including the Suttor River ecological corridor to the north-west. The proposed Brigalow offset area is approximately 450 m from the Suttor River and the western portion is in the mapped biodiversity corridor. The offset area is generally well connected in the broader landscape and is within a broad distribution of largely contiguous remnant vegetation to the north, west and south. However, cattle grazing is intensive in the offset area and this inhibits recruitment and the growth of the community to remnant structure. Minimal fencing also allows cattle to significantly overgraze and over-utilise preferable areas.</p> <hr/> <p>Species stocking rate = 2</p>

Attribute	Value	Rationale/assumption
		<p>The offset area is part of larger non-remnant polygons of RE 11.4.9 greater than 1,200 ha. These areas have the potential to form remnant vegetation representative of the Brigalow TEC in the future.</p>
<p>Risk of loss (%) without offset</p>	<p>100%</p>	<p>The Wollombi Station has been historically managed by an agistee for cattle grazing purposes. The vegetation in non-remnant (Category X) areas has been actively managed to suppress woody vegetation in order to increase livestock carrying capacity and ease of livestock management. Management actions have included removing juvenile trees and shrubs and managing fuel loads. It is understood that it is the intention of the agistee to continue these practices as routine management of the balance of the property once offsets have been finalised and set aside (Lane Infrastructure Pty Ltd pers. comms. 12 September 2016). Therefore, it is reasonable to expect that the offset area would otherwise become gradually degraded from its current state as a result of the on-going land management practices</p> <p>Due to the Category X non-regulated classification of this area under the VMA, it is anticipated that the area of regrowth will be maintained in a suppressed or cleared state in the future without the need for permits.</p>
<p>Future quality without offset</p>	<p>4/10</p>	<p>Site condition =1.5</p> <p>The condition of vegetation particularly the abundance of native sedges will potentially be adversely affected over the long term, particularly on the edge of soak areas where existing land management is maintained. Cattle grazing will further degrade the ground cover layer and shrub layer, particularly during times of extended drought, and the community will unlikely meet remnant and/or TEC status in the foreseeable future. Weed infiltration of other areas is a risk to this community.</p> <hr/> <p>Site context = 1.5</p> <p>Connectivity is unlikely to be substantially affected as the offset area is connected with large tracts of remnant vegetation to the west.</p> <p>There is potential for this vegetation to become an area of refuge for cattle during particularly dry conditions and seasons due to the moist conditions of the ground layer.</p>

Attribute	Value	Rationale/assumption
		<p>Species stocking rate = 1.0</p> <p>There is potential for broad scale clearing within the offset area and adjacent non-remnant areas. The offset area is currently non-remnant and mapped as non-regulated and therefore clearing associated with land management practices is possible and highly likely.</p>
Risk of loss (%) with mitigation and management	5%	Unlikely, as habitat quality will be improved with cattle management and legal protection of the non-regulated vegetation from clearing for pasture production.
Future quality with mitigation and management	8/10	<p>Site condition = 3.5</p> <p>The existing values and quality of habitat in the offset area will be improved with active management of cattle grazing, fire regimes and weed invasion.</p>
		<p>Site context = 2.0</p> <p>Removing constant grazing pressure will allow gradual recovery of the vegetation to remnant status.</p>
		<p>Species stocking rate = 2.5</p> <p>Protection and improvement of the quality of this vegetation will result in a large patch of this TEC that is well connected in the broader landscape.</p>
Confidence in averted loss	80%	<p>There is a high level of confidence that loss will occur without protection and intervention through gradual decline in habitat quality particularly through continued heavy grazing by cattle and clearing for pasture production.</p> <p>The management and mitigation measures proposed are low risk measures and they are widely applied as standard techniques in the industry. The measures to be applied tend to result in incremental gains but the outcomes are positive and relatively certain.</p>
Confidence in change of habitat quality	80%	<p>The offset area and broad management strategies are in line with managing the key threats to Brigalow TEC identified in the conservation advice, i.e. reducing vegetation clearing, managing fire risk and cattle grazing pressure (TSSC, 2013). Specifically, the offset will legally secure a large area of vegetation and future land management will allow the vegetation to improve in structure and quality to meet remnant status and the condition thresholds for the Brigalow TEC.</p>

3.3.7 Ornamental Snake - Site Surveys and Results

Table 6B shows the description and rationale for the offset area scoring used in the EPBC Act Offset Assessment Guide for the Ornamental Snake primary habitat.

Table 6B: Offset Area – EPBC Act Offset Assessment Guide Inputs – Ornamental Snake

Attribute	Value	Rationale/assumption
Offset Area		
Description	229.9 ha (165.0 ha of non-remnant RE 11.4.9 (polygons 30 and 32) and 64.9 ha of non-remnant RE 11.4.9 +/- 11.4.2 (polygons 39 and 43))	<p>The offset area is situated adjacent to a stretch of the Suttor River riparian corridor. The offset area is approximately 4 km south-west of the Stage 1 impact area. The offset area is connected to other extensive tracts of remnant vegetation to the south, west and north-west and framed by the Suttor River to the west and north-west and Suttor Creek to the south. The Wollombi offset area is connected to the Stage 1 impact area via remnant vegetation along the Suttor River. The offset area also provides habitat for Brigalow TEC, and dispersal habitat for the Squatter Pigeon as well as other SSBV (see Table 2).</p> <p>The characteristics of the offset area, particularly polygon 32, are considered to present opportunity for substantial improvement in condition of the Brigalow vegetation and gilgai due to the low-lying position of the vegetation in the landscape, underlying clay soils and moist condition of the ground layer.</p>
Time over which loss averted	20 years	A legally binding mechanism would be established for the offset area providing protection and management over the timeframe required to achieve the management plan outcomes.
Time until ecological benefit	5 years	Ecological benefit will principally be achieved through the prevention of clearing, management of cattle grazing, appropriate management of fire regime, management of feral animals (particularly pigs) and control of weeds. These management actions will improve the cover of native grasses and/or sedges and other hydrophilic vegetation that is prevalent in the gilgai areas (e.g. Eleocharis spp.) through reduced soil compaction, trampling and predation that is associated with cattle grazing. These benefits are likely to be realised in approximately 5-10. Reduced grazing pressure will also have the benefit of reduced soil compaction and trampling, which will provide more favourable conditions for recruitment and improve gilgai formation and water quality within gilgai.
	6/10	Site condition = 2.5

Attribute	Value	Rationale/assumption
<p>Start quality (non-remnant RE 11.4.9, polygon 32 and part of polygon 30) (165.0 ha)</p>		<p>The offset vegetation is represented by non-remnant RE 11.4.9 (polygon 32, part of polygon 30), which is dominated by Brigalow and associated Yellowwood and Red-flowered Bauhinia and/or Belah. A high proportion of the ground cover layer was comprised of native sedges, and native grasses. In polygon 32, native ground cover accounted for 37.7% average vegetative cover, while exotic vegetative cover was 5.5%. *Buffel Grass is more prevalent in polygon 30 and in conjunction with *Indian Bluegrass has an average cover of 21.0% compared with the average cover of native grasses, which is 4.8%. Gilgai formation is of good condition with clay cracks in excess of 2 m deep. There is limited coarse woody debris most likely due to the age of the vegetation and there was evidence of stick raking throughout this habitat.</p> <p>The vegetation is non-remnant, although there is recruitment of key species, including Brigalow. Species richness is above average. There are large areas of low weed cover compared with exotic grass cover. The moist condition of the ground layer across large sections of this offset area impede *Buffel Grass growth to the extent that it does not readily outcompete native cover. These conditions have also allowed persistence of native sedges in the ground layer, which further improves the quality of the gilgai for Ornamental Snake.</p> <p>Site context = 3</p> <p>The offset area is connected with other large tracts of remnant and non-remnant vegetation and these are connected to the Suttor River corridor only 0.4 km to the north-west. The offset area is generally well connected in the broader landscape and is within a broad distribution of largely contiguous remnant vegetation to the north, west and south.</p> <p>Species stocking rate = 0.5</p> <p>The offset area is well within the known distribution of the Ornamental Snake and there is good connectivity with expansive remnant areas to the north-west. It is considered highly likely to be present, particularly in areas such as Polygon 32, as gilgai formation is in good condition and numerous deep cracks are present.</p>
<p>Start quality (non-remnant RE</p>	<p>5/10</p>	<p>Site condition = 2</p> <p>Regrowth vegetation was representative by non-remnant RE 11.4.9. A high proportion of the ground cover layer was</p>

Attribute	Value	Rationale/assumption
<p>11.4.9, polygons 39 and 43) (64.9 ha)</p>		<p>comprised of *Buffel Grass +/- *Indian Bluegrass. Minor gilgai formation was also recorded, but it would appear that the historic structure and depth of these has been impacted through the frequency of clearing. There is limited coarse woody debris most likely due to the age of the vegetation and there was evidence of stick raking throughout this habitat.</p> <p>The vegetation is non-remnant, although there is recruitment of key species, including Brigalow. Species richness is moderate. There are large areas of low weed cover compared with exotic grass cover. The moist condition of the ground layer across large sections of this offset area impede *Buffel Grass growth to the extent that it does not readily outcompete native cover.</p> <p>Site context = 3</p> <p>The offset area is connected with other large tracts of remnant and non-remnant vegetation and these are connected to the Suttor River corridor only 0.4 km to the north-west. The offset area is generally well connected in the broader landscape and is within a broad distribution of largely contiguous remnant vegetation to the north, west and south. However, cattle grazing is intensive in the area where the offset is located and this inhibits recruitment and the growth of the community to remnant structure. It also affects condition and suitability of the understorey and gilgais to support Ornamental Snake.</p> <p>Species stocking rate = 0.5</p> <p>The offset area is well within the known distribution of the Ornamental Snake and there is good connectivity with expansive remnant areas to the north-west. It is considered highly likely to be present, particularly in areas such as Polygon 32, although species abundance cannot be assumed.</p>
<p>Risk of loss (%) without offset</p>	<p>100%</p>	<p>The Wollombi Station has been historically managed by an agistee for cattle grazing purposes. The vegetation in non-remnant (Category X) areas has been actively managed to suppress woody vegetation in order to increase livestock carrying capacity and ease of livestock management. Management actions have included removing juvenile trees and shrubs and managing fuel loads. It is understood that it is the intention of the agistee to continue these practices as routine management of the balance of the property once offsets have been finalised and set aside (Lane Infrastructure Pty Ltd pers. comms. 12 September 2016). Therefore, it is reasonable to expect that the offset area would otherwise</p>

Attribute	Value	Rationale/assumption
		<p>become gradually degraded from its current state as a result of the on-going land management practices. Cattle grazing will cause further decline in the condition of the ground stratum through ground compaction, erosion of drainage lines and banks of watercourses, spread of existing and infiltration by new weed species. Inappropriate fire management and a lack of legitimate fire-breaks is also a significant on-going risk for this community.</p> <p>Due to the Category X non-regulated classification of this area under the VMA, it is anticipated that the area of regrowth will be maintained in a suppressed or cleared state in the future without the need for permits.</p>
Future quality without offset	4/10	<p>Site condition =1.5</p> <p>The condition of gilgai and ground layer vegetation particularly the abundance of native sedges will be affected over the long term, especially on the edge of soak areas where existing land management is maintained. Cattle grazing may further degrade the ground cover layer and shrub layer, particularly during times of extended drought, and the community will struggle to meet remnant status. Gilgai formation will likely be shallow, edges degraded and may potentially be lost altogether across large sections of the RE 11.4.9 community due to clearing.</p> <p>Site context = 2.5</p> <p>Connectivity is unlikely to be substantially affected as the offset area is connected with large tracts of remnant vegetation to the west.</p> <p>There is potential for this vegetation to become an area of refuge for cattle during particularly dry conditions and seasons due to the moist conditions of the ground layer.</p> <p>Species stocking rate = 0</p> <p>There is potential for broad scale clearing within the offset area and adjacent non-remnant areas. The offset area is currently non-remnant and mapped as non-regulated and therefore clearing associated with land management practices is possible. Cattle trampling of gilgai could continue to the extent that gilgai formation is no longer present.</p>
Risk of loss (%) with mitigation and management	5%	Unlikely, as habitat quality will be improved with cattle exclusion and legal protection of the non-remnant, non-regulated vegetation.

Attribute	Value	Rationale/assumption
Future quality with mitigation and management (non-remnant RE 11.4.9, polygon 32 and part of polygon 30)	9/10	<p>Site condition = 3.5</p> <p>The existing values and quality of habitat in the offset area will be improved by preventing clearing and with active management of cattle grazing, fire regimes, weed invasion and feral animal (particularly pigs). As native vegetation is allowed to regenerate, microhabitat features such as fallen timber and leaf litter will develop to form the coarse woody debris that is required by Ornamental Snake. However, in some areas that are not as moist as polygon 32, it may take longer than 15 years to establish a canopy of Brigalow that will allow shading out of the Buffel Grass.</p>
		<p>Site context = 3.5</p> <p>Removing clearing and grazing pressure will allow gradual recovery of the vegetation to remnant status and remove the process of trampling and compaction of gilgai. Water quality of gilgai will improve, which will likely improve quality of habitat for frogs, which are the preferred food of Ornamental Snake.</p>
		<p>Species stocking rate = 2</p> <p>Protection and improvement of the quality of this vegetation will result in a large patch of this habitat that is well connected in the broader landscape and will likely support an important population at some point in the future, based on the current DotE definition of an important population (SEWPaC, 2011).</p>
Future quality with mitigation and management (non-remnant RE 11.4.9, polygons 39 and 43)	8/10	<p>Site condition = 3</p> <p>The existing values and quality of habitat in the offset area will be improved with active management of cattle grazing, fire regimes, weed invasion and feral animal (particularly pigs). As native vegetation is allowed to regenerate, microhabitat features such as fallen timber and leaf litter will develop to form the coarse woody debris that is required by Ornamental Snake. However, in some areas that are not as moist as polygon 32 and which have been more heavily used by cattle as is the case for polygons 39 and 43, some exotic grass cover may persist and gilgai may not reform as well.</p>
		<p>Site context = 3.5</p> <p>Removing clearing and grazing pressure will allow gradual recovery of the vegetation to remnant status and remove the process of trampling and compaction of gilgai. Water quality of gilgai will improve, which will likely improve quality of habitat</p>

Attribute	Value	Rationale/assumption
		<p>for frogs, which are the preferred food of Ornamental Snake. These polygons abut remnant areas and are relatively close to the Suttor River and form part of the riparian corridor.</p> <p>Species stocking rate = 1.5</p> <p>Protection and improvement of the quality of this vegetation will result in reasonably sized patches of this habitat that is well connected in the broader landscape and located within remnant areas. Therefore, this habitat will likely support an important population at some point in the future, based on the current DotEE definition of an important population, although the gilgai may not match the qualities of polygons 30 and 32 (SEWPaC, 2011).</p>
Confidence in averted loss	80%	<p>There is reasonable confidence that loss will occur without intervention through gradual decline in habitat quality particularly through continued heavy grazing by cattle. This will affect recruitment of key species, inhibit natural regeneration of the community and degrade gilgai features.</p> <p>The management and mitigation measures proposed are low risk measures and they are widely applied as standard techniques in the industry. The measures to be applied tend to result in small gains but the outcomes are positive and relatively certain.</p>
Confidence in change of habitat quality	80%	<p>The offset area and broad management strategies are in line with managing the key threats to Ornamental Snake habitat identified in the conservation advice, i.e. reducing vegetation clearing, managing fire risk and cattle grazing pressure (TSSC, 2013). Specifically, the offset will legally secure a large area of habitat and future land management will allow the vegetation to improve in structure and quality to meet remnant status and the condition thresholds for the Brigalow TEC and deep well formed gilgai will be maintained.</p>

3.3.8 Squatter Pigeon (Southern) - Site Surveys and Results

Critical habitat is not defined for the Squatter Pigeon (southern). Due to the importance placed on habitat, site condition and site context (proximity to water) are considered more important habitat characteristics than species stocking rate in this instance. Stocking rate is not known for the impact area or offset area, however, the Squatter Pigeon (southern) was recorded in low numbers from both the impact and offset areas during the

recent vegetation survey (September 2015). Further, the species is known to occur in the broader area based on Wildlife Online searches of the impact and offset areas with a 25 km buffer (DEHP 2015).⁵

On-site surveys of the offset site were conducted during the EIS surveys in 2013 and again in August and September 2016. Surveys were undertaken during the optimal period of the year to detect the Squatter Pigeon (southern) which is during the mid to late dry season from May to the end of October as the subspecies is most actively foraging for grass seed at this time. Squatter Pigeon was identified during the surveys; however, a moderate stocking rate is likely, due to a single flock being identified at both the impact and offset sites as per Section 3.1.2 of the field survey report at **Appendix A1**.

Table 6C.1 and **Table 6C.2** show the description and rationale for the offset area scoring used in the EPBC Act *Offset Assessment Guide* for the impacted Squatter Pigeon (southern) primary habitat.

Table 6C.1: Offset Area – EPBC Act Offset Assessment Guide Inputs – Squatter Pigeon (southern)

Attribute	Value	Rationale/assumption
Offset Area		
Description	198.3 ha (9.3 ha of remnant RE 11.3.2 and 189.0 ha of non-remnant REs 11.3.2, 11.3.4, 11.5.3 and 11.5.9)	<p>The offset area is situated adjacent to a 3.6 km stretch of the Suttor River riparian corridor. The offset area is approximately 4 km south-west of the Stage 1 impact area. The offset area is connected to other extensive tracts of remnant vegetation to the south, west and north-west and framed by the Suttor River to the north and Suttor Creek to the south. The Wollombi offset area is connected to the Stage 1 impact area via remnant vegetation along the Suttor River.</p> <p>Squatter Pigeon habitat in the form of RE 11.7.4 does not occur in the offset area, however, REs 11.5.3 and 11.5.9 are present and suitable as offset areas due to their grassy woodland assemblages and close proximity to Suttor Creek and Suttor River (i.e. <3 km). The Species Profile and Threats (SPRAT) Database for the Squatter Pigeon describes foraging habitat as being 'mostly dominated in the overstorey by <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species, as part of remnant, regrowth or partly modified vegetation and within 3 km of waterbodies or watercourses (seasonal or permanent)'. REs on land zones 5 and 7 are specifically referred to as potential habitat for the Squatter Pigeon in Queensland (DotE, 2015b).</p> <p>Remnant and non-remnant REs 11.3.2 and 11.3.4 in the offset area are also considered to provide potential habitat for this species as although land zone 3 is not specifically referred to in the SPRAT profile for the Squatter Pigeon, this community provides a grassy woodland habitat dominated by eucalypt species (Poplar Box in RE 11.3.2, and mixed eucalypt species in RE 11.3.4) on well-draining, sandy and loosely consolidated soils and is within 3 km of seasonal watercourses being the Suttor River and Suttor Creek. Squatter Pigeon has previously been recorded on other sites on land zone 3 (Ecological Survey & Management, 2015).</p>

⁵ <https://environment.ehp.qld.gov.au/report-request/species-list/>

Attribute	Value	Rationale/assumption
Time over which loss averted	20 years	A legally binding mechanism would be established for the offset area providing protection and management over the timeframe required to achieve the management plan outcomes.
Time until ecological benefit	5 years	Ecological benefit will principally be achieved through the management of cattle grazing, appropriate management of fire regimes, control of weeds and managing pest animal populations. These management actions will improve the cover of native grasses through reduced soil compaction, trampling and predation that is associated with cattle grazing. These benefits are likely to be realised in approximately 5 years when native grasses have had an opportunity to re-colonise areas currently dominated by exotic grasses.
Start quality (remnant RE 11.3.2, polygons 47, 50, 53 & 54) (9.3 ha)	7/10	Site condition = 3 A large portion of this habitat is of remnant condition and species richness is high. The groundcover in many areas showed moderate grazing damage and an exotic grass cover averaging more than 43%. Native species were common.
		Site context = 3 The offset area flanks other remnant communities along Suttor River. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources.
		Species stocking rate = 1 Squatter Pigeon (southern) was recorded in the local area just outside the offset area during recent vegetation surveys (September 2015). It is considered to be widespread in central Queensland (Environmental and Licensing Professionals, 2013). The offset area is considered to provide foraging habitat for this species. Breeding habitat is more likely to be restricted to land zone 5 or 7, where sandy or gravelly conditions identified as important in the DotE SPRAT profile are more likely to occur.
Start Quality (non-remnant RE 11.3.2, polygon 34) (41.9 ha)	6/10	Site condition = 2 This habitat is of non-remnant condition and species richness is moderate. The overstorey of the vegetation community is generally comprised of isolated mature and mid-mature Poplar Box. The ecologically dominant layer is most commonly the shrub layer where recruitment of canopy species was prevalent and the distribution

Attribute	Value	Rationale/assumption
		<p>relatively consistent. The groundcover in many areas showed moderate to major grazing pressure and an exotic grass cover in excess of 50%.</p> <p>Site context = 3</p> <p>The offset area flanks the Suttor Creek, which is a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor where large tracts of endangered and remnant vegetation adjoin the confluence of this watercourse with Suttor River. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <p>Species stocking rate = 1</p> <p>A pair of Squatter Pigeon (southern) were recorded in non-remnant RE 11.3.2 to the north of the offset investigation area in September 2015.</p>
<p>Start Quality (non-remnant RE 11.3.4, polygons 45, 46 & 55) (96.4 ha)</p>	6/10	<p>Site condition = 1.5</p> <p>This habitat is of non-remnant condition and species richness is moderate. The overstorey of the vegetation community is generally comprised of isolated mature and mid-mature Clarkson's Bloodwood, Carbeen, Queensland Blue Gum, Dallachy's Gum and/or Narrow-leaved Red Ironbark. The ecologically dominant layer is most commonly the shrub layer where recruitment of canopy species was prevalent but the distribution inconsistent. The groundcover in many areas showed moderate to major grazing pressure and an exotic grass cover in excess of 50%.</p> <p>Site context = 3</p> <p>The offset area flanks the Suttor River, which is a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <p>Species stocking rate = 1.5</p> <p>Nine specimens of Squatter Pigeon (southern) were recorded in polygon 45 in December 2015.</p>
Start Quality	6/10	Site condition = 1.5

Attribute	Value	Rationale/assumption
<p>(non-remnant RE 11.5.3, polygons 58, 59) (21.3 ha)</p>		<p>This habitat is of non-remnant condition and species richness is moderate. The overstorey of the vegetation community is generally comprised of isolated mature and mid-mature Poplar Box. The ecologically dominant layer is most commonly the shrub layer where recruitment of canopy species was prevalent and the distribution relatively consistent. The groundcover in many areas showed moderate to major grazing pressure and an exotic grass cover in excess of 50%.</p> <hr/> <p>Site context = 3</p> <p>The offset area flanks the Suttor River, a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <hr/> <p>Species stocking rate = 1.5</p> <p>Nine specimens of Squatter Pigeon (southern) were recorded adjacent to polygon 61 in December 2015.</p>
<p>Start Quality (non-remnant RE 11.5.9, polygons 41, 56 & 57) (29.4 ha)</p>	<p>6/10</p>	<p>Site condition = 2</p> <p>This habitat is of non-remnant condition and species richness is moderate. The overstorey of the vegetation community is generally comprised of isolated mature and mid-mature Clarkson's Bloodwood, Carbeen and/or Narrow-leaved Red Ironbark. The ecologically dominant layer is most commonly the shrub layer where recruitment of canopy species was prevalent but the distribution inconsistent. The groundcover in many areas showed moderate to major grazing pressure and an exotic grass cover in excess of 50%.</p> <hr/> <p>Site context = 3</p> <p>The offset area flanks the Suttor River, a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <hr/> <p>Species stocking rate = 1</p>

Attribute	Value	Rationale/assumption
		Squatter Pigeon (southern) were recorded in adjacent polygons in December 2015.
Risk of loss (%) without offset	30% (remnant areas) 100% (non-remnant areas)	<p>The Wollombi Station has been historically managed by an agistee for cattle grazing purposes. It is reasonable to expect that the offset area would become gradually degraded from its current state as a result of cattle grazing. Cattle grazing will cause further decline in the condition of the ground stratum through ground compaction, erosion of drainage lines, spread of existing and infiltration by new weed species.</p> <p>The vegetation in non-remnant (Category X) areas has been actively managed to suppress woody vegetation in order to increase livestock carrying capacity and ease of livestock management. Management actions have included removing juvenile trees and shrubs and managing fuel loads. It is understood that it is the intention of the agistee to continue these practices as routine management of the balance of the property once offsets have been finalised and set aside (Lane Infrastructure Pty Ltd pers. comms. 12 September 2016). Therefore, it is reasonable to expect that the offset area would otherwise become gradually degraded from its current state as a result of the on-going land management practices. Cattle grazing will cause further decline in the condition of the ground stratum through ground compaction, erosion of drainage lines and banks of watercourses, spread of existing and infiltration by new weed species. Inappropriate fire management and a lack of legitimate fire-breaks is also a significant on-going risk for this community.</p> <p>Due to the Category X non-regulated classification of portions of this habitat area under the VMA, it is anticipated that the area of regrowth will be maintained in a suppressed or cleared state in the future without the need for permits.</p>
Future quality without offset	5/10	<p>Site condition = 1.5</p> <p>The condition/quality of Squatter Pigeon (southern) habitat particularly the abundance of native grasses general diversity of habitat features in the ground cover layer will potentially be affected over the long term where active management is not provided for habitat areas. Cattle grazing and gradual invasion of improved pasture species, particularly *Buffel Grass, along with understorey management for exotic pasture improvement and minor clearing for cattle yards, fencing etc. will likely continue to some extent. Once improved grazing management practices are imposed, the area will be subject to minimal disturbance. Predation pressure from feral dogs, cats and foxes will be monitored and managed as required. All</p>

Attribute	Value	Rationale/assumption
		<p>non-remnant areas within the offset area are at risk of being cleared without the security of the offset being put in place</p> <hr/> <p>Site context = 2.5</p> <p>Connectivity is unlikely to be substantially affected as all habitat proposed as offsets are within or adjacent to a riparian corridor. There is potential for all non-remnant areas of REs 11.3.2, 11.3.4, 11.5.3 and 11.5.9 to be cleared as these are Category X (unregulated) vegetation. Nonetheless, a conservative approach has been adopted whereby it is considered unlikely that connectivity will be substantially affected in the foreseeable future due to the presence of remnant regulated vegetation management areas.</p> <hr/> <p>Species stocking rate = 1</p> <p>As a result of the reduced site condition there may be a reduction in the Squatter Pigeon (southern) stocking rate of the offset area. However, this is unlikely to be substantial as they are known to use degraded habitats and they are considered widespread in central Queensland (Environmental and Licensing Professionals, 2013).</p>
Risk of loss (%) with mitigation and management	5%	Unlikely, as habitat quality will be maintained and improved with periodic cattle exclusion and active management and monitoring and the prevention of clearing.
Future quality with mitigation and management	8/10	<p>Site condition = 3.5</p> <p>The existing values and quality of habitat in the offset area, particularly in the ground cover layer, will be improved with active management of cattle grazing, fire regimes and weed invasion. This will occur through establishment of greater diversity of micro-habitat features, cover and native foraging resources for the Squatter Pigeon (southern). Once improved grazing management practices are imposed, the area will be subject to minimal disturbance with the maintenance of fire breaks and weed management undertaken as required. Predation pressure from feral dogs, cats and foxes will be monitored and managed as required.</p> <hr/> <p>Site context = 3</p> <p>This element is unlikely to change with management.</p> <hr/> <p>Species stocking rate = 1.5</p> <p>It is expected that where habitat quality is improved from its current state, use of these areas by the Squatter Pigeon (southern) will</p>

Attribute	Value	Rationale/assumption
		increase, particularly where breeding habitat is improved in REs 11.5.3 and 11.5.9.
Confidence in averted loss	80%	There is reasonable confidence that loss will occur without intervention through gradual decline in habitat quality particularly in native grass cover by being over sown with Buffel Grass and continued heavy grazing by cattle and prevention of clearing. The management and mitigation measures proposed are low risk measures and they are widely applied as standard techniques in the industry. The measures to be applied tend to result in small gains but the outcomes are positive and relatively certain.
Confidence in change of habitat quality	80%	The offset area and broad management strategies are in line with the threat abatement actions in the SPRAT profile for the Squatter Pigeon (southern) (DotE, 2015b). ⁶ Specifically, the offset will legally secure a large area of foraging and breeding habitat close to a permanent water-point (the Suttor River and Suttor Creek). In addition, the proposed management actions will improve habitat quality in this area.

Table 6C.2: Offset Area – EPBC Act Offset Assessment Guide Inputs – Squatter Pigeon (southern)

Attribute	Value	Rationale/assumption
<i>Offset Area</i>		
Description	Polygon 60 – 55.77 ha RE 11.5.3	The additional offset areas are situated adjacent to the Suttor River and Suttor Creek riparian corridors, with the nearest offset area being approximately 4 km south-west of the Stage 1 impact area.
	Polygon 31 – 47.49 ha RE 11.3.2	A small portion of the offset area is located on ML 70436; however, the current proposed mine footprint is more than 1km from the offset area, and the vast majority of mining activities are undertaken east of the rail line.
	Polygon 66 – 30.3 ha RE 11.4.8	Squatter Pigeon habitat in the form of RE 11.7.4 does not occur in the offset area, however, REs 11.3.2, 11.4.8, 11.4.9, 11.5.3 and 11.5.9 are present and suitable as offset areas due to their grassy woodland assemblages and close proximity to Suttor Creek and Suttor River (i.e. <3 km). The Species Profile and Threats (SPRAT) Database for the Squatter Pigeon describes foraging habitat as being 'mostly dominated in the overstorey by <i>Eucalyptus</i> , <i>Corymbia</i> , <i>Acacia</i> or <i>Callitris</i> species, as part of remnant, regrowth or partly modified vegetation and within 3 km of waterbodies or
	Additional area south of Polygon 60 – 39.0 ha RE 11.5.3	
	47.1 ha of RE 11.4.9	

⁶ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440

Attribute	Value	Rationale/assumption
	<p>adjacent to Suttor Creek and buffering Polygon 6 and 7</p> <p>Total additional offset – 219.66</p>	<p>watercourses (seasonal or permanent)’. REs on land zones 5 and 7 are specifically referred to as potential habitat for the Squatter Pigeon in Queensland (DotE, 2015b).</p> <p>The offset area is a combination of breeding (i.e. < 1km from water) and foraging habitat. The expanded offset areas are all regrowth vegetation.</p> <p>Polygon 60 (55.77 ha of RE 11.5.3), Polygon 66 (30.3 ha of RE 11.4.8), and Polygons 31 (47.49 ha of RE 11.3.2) are within 1 – 2 km of permanent water, and have been included as suitable breeding and foraging habitat. An additional 39.0 ha south of Polygon 60 has been confirmed as a continuation of RE 11.5.3 by the ecologists who undertook the initial survey, and would be suitable for foraging. Another 47.1 ha of RE 11.4.9 adjacent to Polygons 6 and 7 has also been included, and constitutes potential breeding and foraging This has been confirmed as a continuation of Polygon 60 by the ecologists. See <i>Figure 4</i> in the OAMP and <i>Figure 5</i> in the Ecology Report (Appendix 1A).</p> <p>The offset area is connected to other extensive tracts of remnant vegetation to the south, west and north-west and framed by the Suttor River to the north and Suttor Creek to the south. The Wollombi offset area is connected to the Stage 1 impact area via remnant vegetation along the Suttor River.</p>
Time over which loss averted	20 years	A legally binding mechanism is to be established for the offset area providing protection and management over the timeframe required to achieve the management plan outcomes.
Time until ecological benefit	20 years	<p>Prevention of ongoing clearing regimes and management actions, including exclusion of cattle during breeding times, weed and feral pest monitoring and management are likely to improve site condition and species stocking rate.</p> <p>Although light cattle grazing can improve foraging habitat in isolated cases (i.e. within Land Zone 4, where dense woodland vegetation overlies non-alluvial clay soils), cattle grazing and vegetation clearing for agriculture remain the key threatening process for the Squatter Pigeon.</p> <p>A condition increase from 6 to 8 will principally be achieved through the removal of the ongoing risk of vegetation clearing and subsequent sowing with exotic pasture species, management of cattle grazing, appropriate management of fire regimes, control of weeds, and management of pest animal populations. These management actions will improve the cover of native grasses and reduce soil compaction and trampling that is associated with cattle grazing during the breeding season. These benefits are very likely to</p>

Attribute	Value	Rationale/assumption
		<p>be realised within 20 years when the vegetation has regained structure (including understorey) and native grasses have had an opportunity to re-colonise areas currently dominated by exotic pasture species.</p>
<p>Start Quality (non-remnant RE 11.3.2, Polygon 31) (47.49 ha)</p>	<p>6/10</p>	<p>Site condition = 2</p> <p>This habitat is of non-remnant condition and species richness is moderate. The overstorey of the vegetation community generally comprises isolated mature and mid-mature Poplar Box. The ecologically dominant layer is most commonly the shrub layer where recruitment of canopy species was prevalent and the distribution relatively consistent. The groundcover in many areas showed moderate to major grazing pressure and an exotic grass cover in excess of 50%. The impact of heavy grazing on native grasses resulted in between 0% and 2% native grass cover being recorded which then impacted the condition score.</p> <hr/> <p>Site context = 3</p> <p>The offset area flanks the Suttor River, which is a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor where large tracts of endangered and remnant vegetation adjoin the confluence of this watercourse with Suttor Creek. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <hr/> <p>Species stocking rate = 1</p> <p>A pair of Squatter Pigeon (southern) were recorded in non-remnant RE 11.3.2 to the north of the offset investigation area in September 2015.</p>
<p>Start Quality (non-remnant RE 11.4.8, polygon 66) (30.30 ha)</p>	<p>6/10</p>	<p>Site condition = 1.5</p> <p>RE 11.4.8 is described as <i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains. This polygon has no large trees, and therefore scored 0% for canopy cover. However, all canopy species are evidenced by good recruitment (75% species richness) in the shrub layer. The lack of a canopy cover has resulted in a high exotic grass cover of 95%. The combination of no canopy cover, no native grass species and a high exotic grass cover has resulted in an overall reduction in the condition score for this area. Reference Ecological Equivalence Methodology Sheets attached to the field report.</p> <hr/> <p>Site context = 3</p>

Attribute	Value	Rationale/assumption
		<p>The offset area flanks the Suttor River, a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <p>Species stocking rate = 1.5</p> <p>Nine specimens of Squatter Pigeon (southern) were recorded adjacent to polygon 61 in December 2015.</p>
<p>Start Quality</p> <p>Part of Polygon 30 (non-remnant RE 11.4.9, adjacent to Polygons 6 and 7 on Suttor Creek) (47.10 ha)</p>	6/10	<p>Site condition = 1.5</p> <p>This polygon consists of RE 11.4.9 which is described as <i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains. This polygon has no large trees, and therefore scored 0% for canopy cover. This impacts the score as Squatter Pigeon will only move up to 200m from canopy cover because of predation from raptors. However, all canopy species are evidenced by good recruitment in the over developed shrub layer, which is 433% of the benchmark). The lack of a canopy cover has resulted in a high exotic grass cover that is 28.9% of the benchmark for this RE. This has resulted in an overall reduction in the condition score for this area. Reference Ecological Equivalence Methodology Sheets attached to the field report.</p> <p>Site context = 3</p> <p>The offset area flanks the Suttor River, a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <p>Species stocking rate = 1.5</p> <p>Nine Squatter Pigeon (southern) were recorded adjacent to polygon 61 in December 2015 suggesting a moderate stocking rate.</p>
<p>Start Quality</p> <p>(non-remnant RE 11.5.3, polygon 60)</p>	6/10	<p>Site condition = 1.5</p> <p>This polygon consists of RE 11.5.3 which is composed of <i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces. This polygon has no large trees, and therefore scored 0% for canopy cover.</p>

Attribute	Value	Rationale/assumption
and area South) (94.77 ha)		However, all canopy species have good rates of recruitment and the shrub layer is well developed. The lack of a canopy cover has resulted in a high grass cover that is 266% of the benchmark for this RE. This has resulted in an overall reduction in the condition score for this area. Refer to the Ecological Equivalence Methodology Sheets attached to the field report.
		<p>Site context = 3</p> <p>The offset area flanks the Suttor River, a fifth order watercourse. Connectivity with the broader landscape is maintained along this riparian corridor joining the Suttor Creek to the south-west where large tracts of endangered and remnant vegetation adjoin the confluence of the two watercourses. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p>
		<p>Species stocking rate = 1.5</p> <p>Nine specimens of Squatter Pigeon (southern) were recorded adjacent to polygon 61 in December 2015.</p>
Risk of loss (%) without offset	0%	Based on advise and negotiation with the Department of Environment and Energy a 0% Risk of Loss has been adopted for the additional offset areas without offsets in place

Future quality with risk mitigation and management

Over the period of the offset area management plan, there will be a gradual increase in the following attributes that are directly relevant to the habitat condition for the Squatter Pigeon.

(non-remnant RE 11.3.2, Polygon 31) (47.49 ha)	8/10	<p>Site condition = 3/4</p> <ul style="list-style-type: none"> Native plant species richness (grasses) increase in score from 2.5 to 3 Native perennial grass cover – increase in score from 0 to 3 (note: benchmark native grass cover for this RE is 35%) Non-native plant cover – increase score from 0 to 10 (<5%)
		<p>Site context = 3/4</p> <p>The offset area borders the Suttor River to the west with the area within 500m of the river. The Suttor River is a fifth order watercourse and provides connectivity along the riparian corridor where large tracts of endangered and remnant vegetation adjoin the confluence of this watercourse with Suttor Creek. These watercourses provide seasonal if not permanent (ponded) water sources, which are important for breeding habitat in the area.</p> <p>This attribute is unlikely to change due to the high context of the area selected for the offset from the outset. The return of regrowth vegetation to remnant will increase the canopy cover and protection from predatory</p>

		<p>birds which will add to the context of the landscape allowing the Squatter Pigeon access to larger areas for foraging and breeding habitat.</p> <p>Species stocking rate = 2/2</p> <p>A pair of Squatter Pigeon (southern) were recorded in non-remnant RE 11.3.2 to the north of the offset investigation area in September 2015.</p> <p>It is anticipated that this score would increase from a score of 1 to 2 with a higher population as the condition of the habitat increased and with the added benefit of canopy cover from predatory birds.</p>
<p>(non-remnant RE 11.4.8, polygon 66) (30.30 ha)</p> <p><i>Note – there is no benchmark for 11.4.8 so 11.4.9 was used as a surrogate</i></p>	8/10	<p>Site condition = 3/4</p> <ul style="list-style-type: none"> • Native plant species richness (grasses) increase in score from 3 to 5 • Native perennial grass cover – increase in score from 0 to 3 (note: benchmark native grass cover for this RE is 20%) • Non-native plant cover – increase score from 0 to 10 (<5%) <p>Site context = 3/4</p> <p>The offset area adjoins polygon 31 (above) and is between 500m and 1km from the Suttor River. The eastern side of the polygon is along a small empirical stream that has water during the wet season. Due to its proximity to the river and remnant vegetation, the context will improve with canopy cover, however the overall context score is not expected to change.</p> <p>Species stocking rate = 2/2</p> <p>A pair of Squatter Pigeon (southern) were recorded in the non-remnant RE 11.3.2 (polygon 66 described above) to the north of the offset investigation area in September 2015.</p> <p>It is anticipated that this score would increase from a score of 1 to 2 with a higher population as the condition of the habitat increased and with the added benefit of canopy cover from predatory birds.</p>
<p>Part of Polygon 30 (non-remnant RE 11.4.9, adjacent to Polygons 6 and 7 on Suttor Creek) (47.10 ha)</p>	8/10	<p>Site condition = 3/4</p> <ul style="list-style-type: none"> • Tree canopy cover increase score from 0 to 5 (>50%-<200%) • Native plant species richness (grasses) increase in score from 3 to 5 • Native perennial grass cover – increase in score from 3 to 5 (note: benchmark native grass cover for this RE is 20%) • Non-native plant cover – increase score from 3 to 5 (<5-25%) <p>Site context = 3/4</p> <p>This polygon is entirely within 1.1km of Suttor Creek which forms the southern boundary of part of the polygon as well as the boundary of the property. Suttor Creek is a stream order 5 and has permanent ponded pools during the later dry season and permanent water during the wet season. The creek has a riparian corridor which consists of remnant vegetation RE 11.3.2. The polygon is considered breeding habitat. Due to the proximity to permanent water, this score is not considered to increase over time although there will be an increase in the connectivity to remnant vegetation over time.</p> <p>Species stocking rate = 2/2</p>

		This area of the property only recorded low numbers at the survey in 2015 with only pairs sighted. It is anticipated that the stocking rate would increase over time and therefore the score is increased from 1.5 to 2.
(non-remnant RE 11.5.3, polygon 60 and area South) (94.77 ha)	8/10	<p>Site condition = 3/4</p> <ul style="list-style-type: none"> • Tree canopy cover increase score from 0 to 5 (>50%-<200%) • Native plant species richness (grasses) increase in score from 2.5 to 3 • Native perennial grass cover – increase in score from 3 to 5 (note: benchmark native grass cover for this RE is 20%)
		<p>Site context = 3/4</p> <p>This attribute is unlikely to change due to the high context of the area selected for the offset from the outset.</p>
		<p>Species stocking rate = 2/2</p> <p>This area of the property only recorded low numbers at the survey in 2015 with only pairs sighted., however a larger population was recorded in the adjacent polygon 61 during the 2015 survey. Therefore, it is anticipated that the stocking rate would increase with the improvement in the habitats condition and connectivity and therefore the score is increased from 1.5 to 2.</p>
Future quality without offset	5/10	<p>Site condition = 1</p> <p>The condition/quality of Squatter Pigeon (southern) habitat particularly the abundance of native grasses general diversity of habitat features in the ground cover layer will potentially be affected over the long term where active management is not provided for habitat areas. Cattle grazing and gradual invasion of improved pasture species, particularly *Buffel Grass, along with understorey management for exotic pasture improvement and minor clearing for cattle yards, fencing etc. will likely continue to some extent. Once improved grazing management practices are imposed, the area will be subject to minimal disturbance. Predation pressure from feral dogs, cats and foxes will be monitored and managed as required. All non-remnant areas within the offset area are at risk of being cleared without the security of the offset being put in place</p>
		<p>Site context = 3</p> <p>Connectivity is unlikely to be substantially affected as all habitat proposed as offsets are within or adjacent to a riparian corridor which is remnant vegetation. The majority of Wollombi Station, to the east and south of the offset area is mapped as Category X and has no protection from re-clearing. Additionally, there is potential for all non-remnant areas of the offset site to be re-cleared resulting in a loss of some connectivity and patch size in the landscape</p>
		<p>Species stocking rate = 1</p>

		<p>As a result of the reduced site condition there may be a reduction in the Squatter Pigeon (southern) stocking rate of the offset area. However, this is unlikely to be substantial as they are known to use degraded habitats and they are considered widespread in central Queensland (Environmental and Licensing Professionals, 2013).</p>
Risk of loss (%) with mitigation and management	0%	<p>Based on advise and negotiation with the Department of Environment and Energy a 0% Risk of Loss has been adopted for the additional offset areas with mitigation and management.</p>
Future quality with mitigation and management	8/10	<p>Site condition = 3.5</p> <p>Time until ecological benefit has been estimated at 20 years to allow sufficient time for quality to improve, while also managing for unforeseen or force majeure events. However, with the increase in “time until ecological benefit”, an increase from 6 to 8 over 20 years would be reasonable.</p> <p>The existing values and quality of habitat in the offset area, particularly in the ground cover layer, will be improved with active management of cattle grazing, fire regimes and weed invasion. This will occur through establishment of greater diversity of micro-habitat features, cover and native foraging resources for the Squatter Pigeon (southern). Once improved grazing management practices are imposed, the area will be subject to minimal disturbance with the maintenance of fire breaks and weed management undertaken as required. Predation pressure from feral dogs, cats and foxes will be monitored and managed as required.</p> <hr/> <p>Site context = 3</p> <p>This element is unlikely to change with management.</p> <hr/> <p>Species stocking rate = 1.5</p> <p>Foraging and predominantly breeding habitat is being provided within the offset. Proposed management actions include management of cattle access and exclusion during the Squatter Pigeon breeding season, as well as weed and pest species monitoring and control to improve both foraging and breeding habitat.</p> <p>The re-establishment of a structured vegetation community including a shrub layer and the reduction in exotic pastures and increase in native grasses will support increased breeding and foraging opportunities.</p> <p>It is expected that where habitat quality is improved from its current state, use of these areas by the Squatter Pigeon (southern) will</p>

		increase, particularly where breeding habitat is improved in REs 11.5.3 and 11.5.9.
Confidence in averted loss	90%	<p>The main threats to the Squatter Pigeon (southern) are the loss and fragmentation of habitat due to clearing for agricultural purposes, the degradation of habitat by overgrazing by domesticated herbivores, especially the sheep (<i>Ovis</i> species) and the cow (<i>Bos</i> species), the degradation of habitat by invasive weeds, such as buffel grass (<i>Cenchrus ciliaris</i>), and predation by numerous avian and terrestrial predators (EPA 2006; Frith 1982b; Le Souef 1923; North 1913-14; Squatter Pigeon Workshop 2011).</p> <p>The management strategies outlined in the BOMP directly address all of these key threats and are sufficient to provide an increase in in habitat quality of 6 to 8, within 20 years.</p> <p>There is reasonable confidence that loss will occur without intervention through gradual decline in habitat quality particularly in native grass cover by being over sown with Buffel Grass and continued heavy grazing by cattle and prevention of clearing.</p> <p>The management and mitigation measures proposed are low risk measures and they are widely applied as standard techniques in the industry. The measures to be applied tend to result in small gains but the outcomes are positive and relatively certain.</p>
Confidence in change of habitat quality	85%	<p>The offset area and broad management strategies are in line with the threat abatement actions in the SPRAT profile for the Squatter Pigeon (southern) (DotE, 2015b). ⁷Specifically, the offset will legally secure a large area of foraging and breeding habitat close to a permanent water-point (the Suttor River and Suttor Creek). In addition, the proposed management actions will improve habitat quality in this area.</p>

4 LEGALLY BINDING MECHANISM

The offset area will be secured using one of the legally binding mechanisms on title that are available to ensure the protection of the offset and implementation of the OAMP. These legally binding mechanisms are:

- an environmental offset protection area under section 30 of the *Environmental Offsets Act 2014 (Qld)*;
- an area declared as an area of high nature conservation value under section 19F of the VMA where it is secured for the purposes of an environmental offset;

⁷ http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440

- declared as a nature refuge under section 46 of the *Nature Conservation Act 1992 (Qld)*, where it is secured for the purposes of an environmental offset;
- declared as a protected area under section 29(1) of the *Nature Conservation Act 1992 (Qld)*, where it is secured for the purposes of an environmental offset; or
- secured as a statutory covenant for environmental purposes under the *Land Act 1994 (Qld)* or *Land Title Act 1994 (Qld)*.

The mechanisms adopted to secure offsets will ultimately depend upon the mechanisms available and agreed to by the relevant parties. In this instance, the offset will be secured via a Voluntary Declaration as an area of high conservation value under the VMA. Once this has been registered on the title, the offset area will be mapped as a Category A area on a Property Map of Assessable Vegetation (**PMAV**). Category A areas on PMAVs are red in colour and are described as “Areas subject to compliance notices, offsets and voluntary declarations”. A copy of the draft Request for Voluntary Declaration for the Wollombi property is provided at **Schedule 2**. The offset area will be secured within four months of the delegate’s approval of this Plan.

5 OFFSET MANAGEMENT

5.1 Wollombi Station

An OAMP has been prepared in accordance with the specific requirements contained within this final offset strategy (i.e., this Offset Delivery Plan) submitted for approval. The OAMP includes, but is not limited to, information on the threats and management actions required on the offset area to abate those threats identified to the Brigalow TEC, and primary habitat for the Ornamental Snake and Squatter Pigeon (southern). The OAMP contains details of the management, reporting and monitoring program that will extend until the management outcomes are achieved.

Management actions recommended include:

- limitations on the clearing of vegetation to that required for maintenance of fencing and fire control lines;
- exclusion of domestic livestock from the offset area except for the infrequent grazing associated with fuel reduction in dry periods;
- feral pest animal management;
- management of fire; and
- a weed management program.

Refer to **Schedule 1** for the Wollombi Station OAMP. The schedule of management actions for Wollombi Station is reproduced in **Table 7** below for ease of reference. These management actions apply to the offset area from when the Queensland Government approves the voluntary declaration until 1 October 2044.

5.1.1 Input from a suitably qualified expert

Dr Don Butler, Senior Botanist from the Queensland Herbarium and Mr Grant Paterson from Aurecon Australia (Mackay) were both consulted during the drafting of the management actions as presented in **Table 7**. The supporting ecology report was undertaken by Mr Chris Hansen of EcoSM, an ecologist with over 10 years’ experience in Queensland. The curricula vitae for Dr Butler and Mr Paterson are attached at **Appendix C**.

5.1.2 Active regeneration

Active regeneration in the region that this Project occupies involves mitigating the risks identified in **Table 7** of the OAMP as provided at **Schedule 1**. Planting of species is not recommended or required in this environment due to the high risk associated with high temperatures and the lack of water as well as predation by native animals such as kangaroos and wallabies. Natural regeneration can occur successfully from in-situ seedstock when cattle grazing and fire is managed appropriately. This leads to a natural thickening of the vegetation community and allows native grasses to compete with the buffel grass as it retreats due to increased canopy

cover. The impact of stopping the use of inappropriate fire regimes also allows the accumulation of coarse woody debris increasing the habitat quality for native species.

5.1.3 Relevant conservation advice - Brigalow

The following sources were reviewed as part of determining the appropriate management actions for the Brigalow offset area:

- SPRAT Profile⁸
- *Commonwealth Conservation Advice for Brigalow Ecological Community*⁹
- *Commonwealth Listing Advice on Brigalow (Acacia harpophylla dominant and co-dominant)*¹⁰

The *Queensland Brigalow Belt Reptile Recovery Plan (2008)* has not been adopted by DoE, however the document was referred to during the drafting of this ODP and associated OAMP.¹¹

The threats identified in the Approved Conservation Advice for the Brigalow TEC, which was approved in 2013, are described as:

*“Threats to the Brigalow ecological community include factors that may further reduce its extent or cause a decline in condition. The most important threats and risks, in order of significance, include clearing, fire, weeds, feral animals and inappropriate grazing (Butler, 2007). Climate change is an emerging threat that needs consideration in management. Several of these threats are listed as key threatening processes under the EPBC Act. Disturbances such as clearing, intense fires and overgrazing, tend to reduce one or more of the key habitat characteristics for the fauna species (Butler, 2007).”*¹²

The schedule of management actions in **Table 7** addresses the most important threats and risks identified above. These are clearing, fire, weeds, feral animals and inappropriate grazing.

5.1.4 Relevant conservation advice – Ornamental Snake

The following sources were reviewed as part of determining the appropriate management actions for the Ornamental Snake offset area:

- SPRAT Profile¹³
- *Commonwealth Conservation Advice for Denisonia maculata (Ornamental Snake)*¹⁴

⁸ SPRAT Profile for Brigalow (*Acacia harpophylla* dominant and co-dominant) (accessed at: <http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=28>)

⁹ Threatened Species Scientific Committee (TSSC) (2013). *Commonwealth Conservation Advice for Brigalow Ecological Community*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservation-advice.pdf>. In effect under the EPBC Act from 17-Dec-2013.

¹⁰ Threatened Species Scientific Committee (TSSC) (2001). *Commonwealth Listing Advice on Brigalow (Acacia harpophylla dominant and co-dominant)*. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/brigalow.html>. In effect under the EPBC Act from 04-Apr-2001.

¹¹ Richardson, R. (2006). *Queensland Brigalow Belt Reptile Recovery Plan 2008 – 2012*. Report to the Department of the Environment, Water, Heritage and the Arts, Canberra. WWF-Australia, Brisbane.

¹² <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservation-advice.pdf>

¹³ SPRAT Profile for Ornamental Snake (accessed at http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1193)

¹⁴ Threatened Species Scientific Committee (TSSC) (2014). *Commonwealth Conservation Advice for Denisonia maculata (Ornamental Snake)*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-advice.pdf>. In effect under the EPBC Act from 29-Apr-2014.

The *Queensland Brigalow Belt Reptile Recovery Plan* (2008) has not been adopted by DoE, however the document was referred to during the drafting of this ODP and associated OAMP.¹⁵

The Approved Conservation Advice for the Ornamental Snake, approved in 2014, identifies the threats to this species, and are described as:

“The main identified threat to the Ornamental Snake is a continued legacy of past broadscale land clearing and habitat degradation. The Brigalow Belt Bioregion is an area of high human impact (Covacevich et al., 1998) with much of the region modified through agricultural and urban development (McDonald et al., 1991; Cogger et al., 1993). Destruction of wetland habitat by feral pigs (Sus scrofa) is also a threat, along with the associated destruction of frog habitat and direct competition for their food source (frogs) (WWF-Australia/QMDC, 2008).

The Ornamental Snake is potentially threatened by poisoning resulting from the ingestion of Cane Toads (Phillips et al., 2003).”¹⁶

The schedule of management actions in **Table 7** addresses the most important threats and risks identified above. These are clearing, feral animals and inappropriate grazing that leads to habitat degradation.

5.1.5 Relevant conservation advice – Squatter Pigeon (southern)

The following sources were reviewed as part of determining the appropriate management actions for the Squatter Pigeon (southern) offset area:

- SPRAT Profile¹⁷
- *Approved Conservation Advice for Geophaps scripta scripta (Squatter Pigeon (southern))*¹⁸
- *Threat abatement plan for predation by feral cats*¹⁹
- *Threat abatement plan for competition and land degradation by rabbits*²⁰
- *Threat Abatement Plan for Predation by the European Red Fox*²¹

The main threats identified in the Approved Conservation Advice for *Geophaps scripta scripta* (Squatter Pigeon (southern)) (DoE, 2015) are ongoing vegetation clearance and fragmentation, overgrazing of habitat by livestock and feral herbivores such as rabbits, introduction of weeds, inappropriate fire regimes, thickening of

¹⁵ Richardson, R. (2006). *Queensland Brigalow Belt Reptile Recovery Plan 2008 – 2012*. Report to the Department of the Environment, Water, Heritage and the Arts, Canberra. WWF-Australia, Brisbane.

¹⁶ <http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-advice.pdf>

¹⁷ SPRAT Profile for Squatter Pigeon (southern) (accessed at http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=64440)

¹⁸ Threatened Species Scientific Committee (TSSC) (2015). *Approved Conservation Advice for Geophaps scripta scripta (Squatter Pigeon (southern))*. Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf>. In effect under the EPBC Act from 27-Oct-2015.

¹⁹ Department of the Environment (2015). *Threat abatement plan for predation by feral cats*. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats>. In effect under the EPBC Act from 23-Jul-2015.

²⁰ Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). *Threat abatement plan for competition and land degradation by rabbits*. Canberra, ACT: Department of the Environment, Water, Heritage and the Arts. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/rabbits08.html>. In effect under the EPBC Act from 01-Oct-2008.

²¹ Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). *Threat Abatement Plan for Predation by the European Red Fox*. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/foxes08.html>. In effect under the EPBC Act from 01-Oct-2008.

understorey vegetation, predation by feral cats and foxes, trampling of nests by domestic stock and illegal shooting.²²

The schedule of management actions in **Table 7** addresses the most important threats and risks identified above.

²² <http://www.environment.gov.au/biodiversity/threatened/species/pubs/64440-conservation-advice-31102015.pdf>

Table 7A: Schedule of Management Actions – Wollombi Station

These management actions apply to the offset area from when the Queensland Government approves the voluntary declaration until 1 October 2044.

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
<p>Forestry operations, native timber harvesting and general vegetation impacts</p> <p>Consistent with the risk of clearing as identified in the Brigalow Conservation Advice and Draft Recovery Plan, Conservation Advice for Reptiles of the Brigalow Belt and Conservation Advice for the Squatter Pigeon (Southern).</p>	<p>1. Vegetation clearing on the offset area is restricted to:</p> <ul style="list-style-type: none"> a) that necessary for the removal of non-native weeds or declared pests b) ensure public safety c) maintenance of existing roads, fence lines, water pipelines and firebreaks; and d) that necessary to establish and maintain access to BioCondition assessment and photo point monitoring sites. <p>Where vegetation clearing is sought for any other purpose, the Landholder must contact the relevant department administering the</p>	<p>Only in those areas subject to non-native weed control, fire control lines and fences.</p>	<p>Vegetation clearing for approved purposes may occur as required.</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of recent forestry or timber harvesting activities.</p> <p>Quarterly inspections will monitor and document vegetation clearing that has occurred for an approved purpose.</p> <p>Additional monitoring required as a corrective action/s.</p>	<p>Trigger for corrective action: detection of prohibited forestry operations, native timber harvesting and general vegetation impacts.</p> <p>Corrective action: upon being notified or becoming aware of prohibited forestry operations, native timber harvesting and general vegetation impacts in the offset area, the Landholder is to reassess access protocols for any lessees etc., signage and general access within one fortnight.</p> <p>Reporting: the Offset Area Report will document any known prohibited forestry operations, native</p>

	<p><i>Vegetation Management Act 1999 (Qld).</i></p> <p>2. Native forest practice (harvesting of timber for forestry purposes) is <u>not</u> allowed under this Offset Area Management Plan.</p> <p>3. Clearing for new fencing will be on the outside of the offset area boundary or along the property boundary.</p> <p>Note: Any vegetation clearing must be undertaken in accordance with:</p> <ul style="list-style-type: none"> • best practice management methods; and • any applicable legislative requirements. For example, the clearing of endangered, vulnerable or near-threatened plant species or the tampering with animal breeding places under <i>Nature</i> 					<p>timber harvesting and general vegetation impacts that have occurred during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
	<p><i>Conservation Act 1992 (Qld)</i></p> <p>Under the <i>Vegetation Management Act 1999</i>, clearing in Least Concern regional ecosystems for fences, roads or tracks is exempt clearing if it is less than 10 m in width. Any new fences, roads or tracks will be less than 10 m in width for each piece of infrastructure. Clearing to establish or maintain a necessary firebreak to protect infrastructure (other than fences, roads and tracks) to a maximum width of 20 m or 1.5 times the height of the tallest adjacent tree, whichever is the greater.</p> <p>Additional management action/s required as a corrective action/s to prevent prohibited clearing.</p>					
<p>Access and signage</p> <p>Note that entry to the offset area can only be gained via the mining</p>	<p>1. Installation of signage along the offset area perimeter to alert</p>	Boundary/entrance points to offset area	Signage to be installed by within three months of the Queensland Government	Pastoral Manager, Landholder or suitable qualified	Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable	Trigger for corrective action: detection of prohibited access by unauthorised persons.

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
<p>lease, which has access restrictions in place under the <i>Mineral Resources Act 1989</i> (Qld).</p> <p>Consistent with the risk of weed incursion as identified in the Brigalow Conservation Advice and Draft Recovery Plan, Conservation Advice for Reptiles of the Brigalow Belt.</p>	<p>traffic of the offset area.</p> <p>2. Installation of slow speed signage at the main entry points to the offset area. Access is restricted to those authorised persons required to undertake actions described in this management plan, including the landholder, QCoal and Byerwen Coal staff and their contractors and assigns. Any other access is to be at the discretion of Byerwen Coal for specific purposes only. Public access to the offset area is prohibited.</p> <p>3. The offset area is not to be utilised for any purpose including recreational activities, or any other activities that deter from achieving the outcomes of this plan.</p>		<p>approving the voluntary declaration.</p>	<p>person appointed by the Landholder.</p>	<p>qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of unauthorised access to the offset area.</p> <p>Quarterly inspections will monitor and document if signage is fit for purpose.</p>	<p>Corrective action: 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.</p> <p>Trigger for corrective action: signage is not fit for purpose.</p> <p>Corrective action: signage will be repaired and maintained as required by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p> <p>Reporting: the Offset Area Report will document any known incidences of prohibited access or signage maintenance issues</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						that have occurred during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area
<p>Fire</p> <p>Consistent with the risk of inappropriate fire regimes as identified in the Brigalow Conservation Advice and Draft Recovery Plan, Conservation Advice for Reptiles of the Brigalow Belt and Conservation Advice for the Squatter Pigeon (Southern).</p>	<p>1. Fire is to be excluded from the offset area except for low intensity ecological burns at the end of the wet season by:</p> <ul style="list-style-type: none"> a) maintaining firebreaks relative to the offset areas; b) using a low intensity fire >7 years interval; and c) firebreaks are to be co-located with roads and fence lines on the 	<p>May be undertaken throughout the offset areas.</p>	<p>All fire (apart from force majeure events) will be excluded from the offset area during Squatter pigeon (southern) breeding and nesting times being mostly the dry season (April to October).</p> <p>Fire control lines must be inspected quarterly. Maintenance must be undertaken as required and at</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p> <p>The undertaking of an ecological burn will be by a suitably qualified person in consultation</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of wild fire, prohibited burning or force majeure events.</p> <p>Quarterly inspections will monitor and document if a</p>	<p>Trigger for corrective action: destruction of regrowth, fallen timber and the occurrence of deliberately lit hot fires</p> <p>Corrective action: upon being notified or becoming aware of a prohibited fire in the offset area, the Landholder is to reassess access protocols for any lessees etc., signage and general access within one fortnight.</p> <p>Corrective action: subsequent to any</p>

	<p>property where possible.</p> <p>Note: Fire is not to be used as a tool for regrowth management on the offset areas.</p>		<p>least biennially (i.e. once every two years).</p> <p>If fire is used, it must be a low intensity fire at >7 years interval immediately after the end of the wet season, which is generally March to April. Ecological burns should not cover more than 30% of the offset area.</p>	<p>with an ecologist.</p>	<p>prescribed low intensity ecological burn has occurred.</p>	<p>occurrence of fire in the offset area, the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder will:</p> <ul 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 grass cover present at the end of the dry season of that year is a minimum: • Brigalow communities 60% grass cover or 1500 kg/ha pasture biomass • Eucalypt communities 60% grass cover or 1500 kg/ha pasture biomass. <p>Grass cover measurements must be in accordance with</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>the methodology stated in the <i>Land Manager's Monitoring Guide</i> (Department of Environment and Resource Management, 2010) (DERM)²³ at Attachment 2 of this document, or any subsequent published version of this document.</p> <p>Trigger for corrective action: low intensity ecological burn exceeds 30% of the offset area.</p> <p>Corrective action: measures to contain the fire are to be implemented immediately. Controlled back burning from the</p>

²³ *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#>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>next fire control line is the preferred method.</p> <p>Reporting: the Offset Area Report will document any known incidences of fire that have occurred during the reporting period corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area</p>
<p>Fencing The proponent commits to installing fencing to protect the offset area. An indicative fencing plan has been prepared and included in the revised OAMP.</p> <p>Consistent with the risk of excess grazing as identified in the Brigalow Conservation Advice and Draft Recovery Plan, and overgrazing as identified</p>	Install and routinely inspect fencing to secure the offset area and prevent unauthorised access.	All external boundaries of the offset area. Where the boundary coincides with the property boundary, the fence may align with the property boundary. A fenced area may include	<p>Fencing of offset areas will be established within three months of the Queensland Government approving the voluntary declaration.</p> <p>If stock are grazing the offset area, fencing must be inspected monthly. During</p>	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will identify if fences are preventing stock and unauthorised</p>	<p>Trigger for corrective action: detection of prohibited access, stock grazing outside of allowed times and thresholds, overgrazing.</p> <p>Corrective action: upon being notified or becoming aware of prohibited access to the offset area, the Landholder is to reassess fencing,</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
in the Conservation Advice for Reptiles of the Brigalow Belt and Conservation Advice for the Squatter Pigeon (Southern).		non-offset areas.	non-grazing periods, fencing must be inspected quarterly.		people from accessing the offset area.	<p>signage and general access within one fortnight.</p> <p>Corrective action: upon being notified or becoming aware of an unsecure offset area (i.e. fencing is not fit for purpose), the Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area as soon as possible and within 10 days. This corrective action may include the installation of new fencing.</p> <p>Reporting: the Offset Area Report will document the installation, maintenance and repair of fences during the reporting period. The report will document how this management action is performing</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						and contributing to the enhancement of the offset area.
<p>Following extreme weather conditions of drought, flood or cyclone</p> <p>Consistent with the general risks as identified in the Brigalow Conservation Advice and Draft Recovery Plan, Conservation Advice for Reptiles of the Brigalow Belt and Conservation Advice for the Squatter Pigeon (Southern).</p>	Determine the extent of damage to the offset area and fencing caused by the event.	Throughout the offset area with particular attention paid to riparian areas and the boundary fencing.	As soon as safely possible post a flood or cyclone event. For a drought event, inspections must be monthly.	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder within one week of the cessation of an extreme event on Wollombi Station.</p> <p>Within the abovementioned timeframe, fencing will be inspected to determine if the offset area is secure.</p> <p>During drought events, monthly inspections will be conducted to record the vegetation condition in the offset area.</p>	<p>Trigger for corrective action: extreme weather conditions of flood or cyclone</p> <p>Corrective action: upon being notified or becoming aware of a flood or cyclone event occurring in offset area, the Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area within one fortnight.</p> <p>Trigger for corrective action: extreme weather conditions of drought</p> <p>Corrective action: upon being notified or becoming aware of a drought event occurring in offset area, the</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>Pastoral Manager is to remove stock from the offset area within one fortnight.</p> <p>Reporting: the Offset Area Report will document the repair of fences and removal of stock from offset areas, as a result of extreme weather conditions, during the reporting period. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
<p>Grazing</p> <p>Consistent with the risk of excess fire as identified in the Brigalow Conservation Advice and Draft Recovery Plan, and overgrazing/habitat destruction as identified in the Conservation Advice for Reptiles of the</p>	<p>Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions.</p> <p>The use of stock in larger numbers for a short period of time in the late dry season and prior to the wet season and if required,</p>	<p>Stock will be grazed in the offset areas for fuel reduction purposes only during the dry season.</p>	<p>As required when grass cover in non-remnant areas exceeds 60% during the dry season.</p> <p>The dry season is normally between April and October; however, if</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least monthly during grazing periods.</p>	<p>Trigger for corrective action: detection of stock grazing outside of the dry season</p> <p>Corrective action: upon being notified or becoming aware of prohibited stock grazing in the offset area, the</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
Brigalow Belt and habitat destruction and food competition Conservation Advice for the Squatter Pigeon (Southern).	<p>again during winter is the preferred method of controlled grazing.</p> <p>Fire and grazing management relating to the Ornamental Snake offset area:</p> <p>A fire in the offset area is foreseen under one of two scenarios:</p> <ul style="list-style-type: none"> • a natural event beyond the control of the approval holder or the landholder • the establishment of fire control lines (i.e. firebreaks) will assist in mitigating the risk posed by such natural events • a low intensity ecological burn permitted by the Pastoral Manager, Landholder or suitably qualified person appointed by the Landholder <p>A low intensity ecological burn permitted under the</p>		<p>unseasonal rainfall should occur, then grazing is to be allowed only if there is no evidence of moisture in the stream order one gullies to ensure that “pugging” of the soil by livestock does not occur.</p>		<p>Monthly inspections will record the minimum grass cover, pasture biomass and security (i.e. fences) of the offset area.</p> <p>Monthly inspections will record the evidence of “pugging” in stream order one gullies.</p>	<p>Pastoral Manager is to remove the stock from the area (if present) and assess the adequacy of fencing within one fortnight. The Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area within one fortnight.</p> <p>Trigger for corrective action: in non-remnant areas grass cover is less than 60% or pasture biomass is less than 1500 kg/ha. (Non-remnant and remnant areas are identified in the most recent ecological condition survey.)</p> <p>Corrective action: upon being notified or becoming aware of exceedance of either threshold, the Pastoral Manager is to remove</p>

	<p>OAMP may not occur more frequently than once every seven years and the timing of such burns may only occur immediately after the end of the wet season (usually March or April). Furthermore, these low intensity ecological burns are prohibited during the Squatter Pigeon (southern) breeding and nesting times (i.e. the dry season). Consequently, the opportunity to conduct low intensity ecological burns will be very infrequent. Throughout the offset area, management actions for fire and grazing are interlinked due to the necessity to manage increased fuel loads that will establish as a consequence of reduced grazing intensity. As Brigalow trees in the offset area establish and mature, their resulting canopy cover will naturally diminish the fuel load as Buffel grass will decline in extent as the canopy cover increases. Until such time,</p>					<p>stock from the offset area within one fortnight. Grazing may recommence prior to the wet season if the grass cover increases to greater than 60% using the methodology in the <i>Land Manager's Monitoring Guide</i> (DERM, 2010) as attached, or any subsequent published version of this document, and pasture biomass exceeds 1500 kg/ha.</p> <p>Trigger for corrective action: in remnant Brigalow communities grass cover is less than 20%. (Non-remnant and remnant areas are identified in the most recent ecological condition survey.)</p> <p>Corrective action: upon being notified or becoming aware of exceedance of the grass cover threshold, the Pastoral Manager is</p>
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	<p>intervention in the form of both low intensity grazing and infrequent low intensity ecological burns will achieve this outcome. The use of stock grazing in the Ornamental Snake offset area has the potential to adversely impact on the species' habitat <i>if poorly managed</i>. At the time of the ecological survey, stock grazing in the offset area was permitted and the area was assessed as suitable habitat for the Ornamental Snake. Therefore the continued use of stock in the area, albeit more restricted, is expected to support the enhancement of the offset area. The management actions seek to avoid adverse impacts by monitoring the offset area more frequently during grazing periods. The Ornamental Snake offset area is comprised of regional ecosystems (RE) 11.4.9 and 11.4.2. Stock occupation will impact on grass cover, therefore upon</p>					<p>to remove stock from the offset area within one fortnight. Grazing may recommence prior to the wet season if the grass cover increases to greater than 60% using the methodology in the <i>Land Manager's Monitoring Guide</i> (DERM, 2010) as attached, or any subsequent published version of this document.</p> <p>Trigger for corrective action: in remnant Eucalypt communities grass cover is less than 35% or pasture biomass is less than 1500 kg/ha. (Non-remnant and remnant areas are identified in the most recent ecological condition survey.)</p> <p>Corrective action: upon being notified or becoming aware of exceedance of either threshold, the Pastoral</p>
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	<p>a predefined minimum grass cover percentage being reached in each of these REs, stock must be removed from the offset area. Stock may not be reintroduced unless the grass cover (again) exceeds 80% during the dry season. Importantly, any sign of significant adverse impacts to low-lying offset areas as a result of stock use (e.g. pugging) will trigger the removal of stock from the offset area.</p> <p>The allowance of stock to the offset area triggers a higher management intensity to mitigate the increased risk of adverse impacts. This management approach will identify adverse impacts as they arise and trigger corrective action/s as necessary. The success of stock grazing in the Ornamental Snake offset area will become apparent during the first dry season under offset area management.</p>					<p>Manager is to remove stock from the offset area within one fortnight. Grazing may recommence prior to the wet season if the grass cover increases to greater than 60% using the methodology in the <i>Land Manager's Monitoring Guide</i> (DERM, 2010) as attached, or any subsequent published version of this document, and pasture biomass exceeds 1500 kg/ha.</p> <p>Trigger for corrective action: stock grazing occurs in the offset area during the dry season and pasture biomass is less than 1500 kg/ha at the end of the dry season.</p> <p>Corrective action: upon being notified or becoming aware of the pasture biomass being less than 1500 kg/ha at the end of the dry</p>
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						<p>season, the Pastoral Manager is to review and adapt stock grazing practices for the following dry season. Evidence of this review and outcome/s must be included in the Offset Area Report.</p> <p>Trigger for corrective action: detection of stock grazing causing pugging in stream order one gullies or significant adverse impacts to low-lying offset areas.</p> <p>Corrective action: upon being notified or becoming aware of stock causing pugging in stream order one gullies or significant adverse impacts to low-lying offset areas, the Pastoral Manager is to remove stock from the offset area within 72 hours.</p> <p>Reporting: the Offset Area Report will</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						document the grazing periods that occurred in the offset areas during the reporting period and the correlating corrective actions that occurred as part of grazing management. The report will document how this management action is performing and contributing to the enhancement of the offset area.
<p>Pest animals</p> <p>Consistent with the risk of habitat damage and predation identified in the Conservation Advice for Reptiles of the Brigalow Belt and Conservation Advice for the Squatter Pigeon (Southern).</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 <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld).</p> <p>Wild pig, deer and dog populations are generally small and highly transient, and therefore the scale of impact is small. Major</p>	All offset areas.	<p>Preferably in the winter and spring months to minimise impacts to the Squatter Pigeon (southern) during breeding and nesting. When a group of animals is observed, a control program will be implemented. The timing of control program</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will record the presence of wallow holes, tracks and</p>	<p>Trigger for corrective action: detection of twelve or more half grown and/or mature wild pigs, deer or dogs during a quarterly inspection.</p> <p>Corrective action: upon being notified or becoming aware of pest animals populations exceeding the threshold, the Pastoral Manager is to implement pest control</p>

	<p>damage to the environment/habitat occurs when large numbers of animals congregate in the area.</p> <p>Current control of pigs and wild dogs is undertaken via a baiting program on the property. Additional to this measure, the Pastoral Manager, during quarterly inspections of the offset area may remove any wild pigs, deer or wild dogs that are seen. If an increase in pig, deer or dog activity is noted, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.</p> <p>There was no evidence of extensive damage from deer, foxes, rabbits or wild cats detected during surveys as part of the Environmental Impact Assessment, however, if the occurrence of these animals is detected, a control program integrated</p>		<p>will address the threats to both species.</p>		<p>visual incidents in the offset area.</p> <p>Note: baseline levels for pest animals are not able to be established due to the transient nature of the animals. Numbers are established via visual signs recorded during quarterly inspections.</p>	<p>measures within one month. The Pastoral Manager or Landholder may approach neighbouring landowners to discuss the increased pest animal presence and an integrated control program may be developed.</p> <p>Reporting: the Offset Area Report will document the indications or sightings of pest animals during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
	with that for wild pigs and dogs will be implemented.					
<p>Pest plants (i.e. weeds) Consistent with the risk of excess fire from excessive weed cover as identified in the Brigalow Conservation Advice and Draft Recovery Plan, and and competition food sources and inappropriate habitat as per the Conservation Advice for the Squatter Pigeon (Southern)</p>	<p>Keep the introduction, establishment and spread of non-native weeds including Declared Pest Plants listed under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld) to less than 10% weed cover in the offset area.</p> <p>Control existing infestations of non-native weeds including declared pest plants under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld) to ensure that the non-native weeds cover less than 10% of the offset area (e.g., Parthenium).</p> <p>Buffel Grass is recognised as being a threat to the</p>	Throughout the offset area	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.	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <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. The field data sheets provided in Appendix A may assist with documenting weed</p>	<p>Trigger for corrective action: pest plants occur in greater than 10% of the offset area</p> <p>Corrective action: upon being notified or becoming aware of pest plants being present in greater than 10% of the offset area, the Pastoral 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; • stem injection; • cut stump; • cut and swab; • stem scraper; and • wick applicators.

	<p>vegetation communities and habitat in the offset area however is not referred to as a weed as it is not declared in the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld). Control measures such as grazing and increasing canopy cover of vegetation are included in this plan to decrease the extent of Buffel Grass over time. Control of Buffel Grass is best managed via grazing during the dry season and increasing tree canopy cover.</p> <p>Spot spraying of patches of Parthenium is permitted.</p>				<p>presence and control measures.</p> <p>Quarterly inspections will be conducted by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder to record the minimum grass cover in the offset area. The following grass cover is to be present at the end of the dry season as a minimum:</p> <ul style="list-style-type: none"> • non-remnant Brigalow communities 60% grasscover or 1500kg/ha pasture biomass • Remnant Brigalow communities 20% grasscover • non remnant Eucalypt Communities 60% groundcover or 1500kg/ha pasture biomass. 	<p>Reporting: the Offset Area Report will document the weed presence and weed control measures during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
					<ul style="list-style-type: none"> Remnant Eucalypt communities 35% grasscover 	

Table 7B: Schedule of Management Actions for the additional Squatter Pigeon offset area on Wollombi Station

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
<p>Forestry operations, native timber harvesting and general vegetation impacts</p> <p>Consistent with the risk of clearing as identified in the Conservation Advice for the Squatter Pigeon (Southern). General Vegetation Impacts are those impacts that occur as a result of weed control, public safety, existing fence, road and fire control line maintenance, stock management and monitoring and reporting.</p>	<p>1. Native forest practice (harvesting of timber for forestry purposes) <u>is not</u> allowed under this Offset Area Management Plan.</p> <p>2. Clearing for new fencing will be on the outside of the offset area boundary or along the property boundary.</p> <p>Note: Any vegetation clearing must be undertaken in accordance with:</p> <ul style="list-style-type: none"> • best practice management methods; and • any applicable legislative requirements. For example, the clearing of endangered, vulnerable or near-threatened plant species or the tampering with animal breeding places under <i>Nature Conservation Act 1992 (Qld)</i> <p>Additional management action/s required as a corrective action/s to prevent prohibited clearing.</p>	<p>Only in those areas subject to non-native weed control, fire control lines and fences.</p>		<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of recent forestry or timber harvesting activities.</p> <p>Quarterly inspections will monitor and document vegetation clearing that has occurred for an approved purpose.</p> <p>Additional monitoring required as a corrective action/s.</p>	<p>Trigger for corrective action: detection of prohibited forestry operations, native timber harvesting and general vegetation impacts.</p> <p>Corrective action: upon being notified or becoming aware of prohibited forestry operations, native timber harvesting and general vegetation impacts in the offset area, the Landholder is to reassess access protocols for any lessees etc., signage and general access within one fortnight.</p> <p>Reporting: the Offset Area Report will document any known prohibited forestry operations, native timber harvesting and general vegetation impacts that have occurred during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
<p>Access and signage</p> <p>Note that entry to the offset area can only be gained via the mining lease, which has access restrictions in place under the Mineral Resources Act 1989 (Qld).</p> <p>Any traversing of the offset site for monitoring purposes is to follow contour lines and minimise impacts to vegetation as much as possible.</p>	<ol style="list-style-type: none"> 1. Installation of signage along the offset area perimeter to alert traffic of the offset area. 2. Installation of slow speed signage at the main entry points to the offset area. Access is restricted to those authorised persons required to undertake actions described in this management plan, including the landholder, QCoal and Byerwen Coal staff and their contractors and assigns. Any other access is to be at the discretion of Byerwen Coal for specific purposes only. Public access to the offset area is prohibited. 3. The offset area is not to be utilised for any purpose including recreational activities, or any other activities that deter from achieving the outcomes of this plan. 	Boundary/entrance points to offset area	Signage to be installed by within three months of the Queensland Government approving the voluntary declaration.	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of unauthorised access to the offset area.</p> <p>Quarterly inspections will monitor and document if signage is fit for purpose.</p>	<p>Trigger for corrective action: detection of prohibited access by unauthorised persons.</p> <p>Corrective action: upon being notified or becoming aware of prohibited access to the offset area, the Byerwen Coal is to reassess access protocols for any lessees etc., signage and general access within one fortnight.</p> <p>Damage to signage will be repaired within one fortnight of noting the damage. Access protocols will be reviewed and amended if necessary and the impacted area's regeneration monitored during the quarterly inspections.</p> <p>Trigger for corrective action: signage is not fit for purpose.</p> <p>Corrective action: signage will be repaired and maintained as required by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>Reporting: the Offset Area Report will document any known incidences of prohibited access or signage maintenance issues that have occurred during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area</p>
<p>Fire</p> <p>Consistent with the risk of inappropriate fire regimes as identified in the Conservation Advice for the Squatter Pigeon (Southern).</p>	<p>Fire is to be excluded from the offset area except for low intensity ecological burns at the end of the wet season by:</p> <ul style="list-style-type: none"> maintaining firebreaks relative to the offset areas; using a low intensity fire >7 years interval; and firebreaks are to be co-located with roads and fence lines on the 	<p>May be undertaken throughout the offset areas.</p>	<p>All fire (apart from force majeure events) will be excluded from the offset area during Squatter pigeon (southern) breeding and nesting times being mostly the dry season (April to October).</p> <p>Fire control lines must be inspected quarterly. Maintenance must be undertaken as required and at least biennially (i.e. once every two years).</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.</p> <p>The undertaking of an ecological burn will be by a suitably qualified person in consultation with an ecologist.</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will monitor and document if there is evidence of wild fire, prohibited burning or force majeure events. Fencing is to be checked and repaired (if necessary) to a stock proof condition within 10 days of any <i>Force Majeure</i> event.</p> <p>Quarterly inspections will monitor and document if a prescribed low intensity ecological burn has occurred.</p> <p>Weed cover is to be monitored by the same methodology and at the same</p>	<p>Trigger for corrective action: destruction of regrowth, fallen timber and the occurrence of deliberately lit hot fires</p> <p>Corrective action: upon being notified or becoming aware of a prohibited fire in the offset area, Byerwen Coal is to reassess and implement new access protocols for any lessees etc., signage and general access within one fortnight.</p> <p>Corrective action: subsequent to any occurrence of fire in the offset area, the Pastoral</p>

	<p>property where possible.</p> <p>Note: Fire is not to be used as a tool for regrowth management on the offset areas.</p> <p>A fire in the offset area is foreseen under one of two scenarios:</p> <ul style="list-style-type: none"> • a natural event beyond the control of the approval holder or the landholder • the establishment of fire control lines (i.e. firebreaks) will assist in mitigating the risk posed by such natural events • a low intensity ecological burn permitted by the Pastoral Manager, Landholder or suitably qualified person appointed by the Landholder <p>A low intensity ecological burn permitted under the OAMP may not occur more frequently than once every seven years and the timing of such burns may only occur immediately after the end of the wet season (usually March or April). Furthermore, these low intensity ecological burns are prohibited during the Squatter Pigeon (southern) breeding and nesting times (i.e.</p>		<p>If fire is used, it must be a low intensity fire at >7 years interval immediately after the end of the wet season, which is generally March to April. Ecological burns should not cover more than 30% of the offset area.</p> <p>If a Force Majeure fire occurs within the offset areas, controlled burning is not to be undertaken for at least 7 years after.</p>		<p>time as the grass cover and weed control undertaken post a fire event to ensure weed cover is <5%.</p> <p>Grass 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)²⁴ provided as <i>Attachment 2</i> of the OAMP, or any subsequent published version of this document.</p>	<p>Manager, Landholder or suitable qualified person appointed by the Landholder will:</p> <ul 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%: <p>Trigger for corrective action: low intensity ecological burn exceeds 30% of the offset area.</p> <p>Corrective action: measures to contain the fire are to be implemented immediately. Controlled back burning from the next fire control line is the preferred method.</p> <p>Reporting: the Offset Area Report will document any known incidences of fire that have occurred during the reporting period corrective actions. The report will document how this management action is</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
	the dry season). Consequently, the opportunity to conduct low intensity ecological burns will be very infrequent.					performing and contributing to the enhancement of the offset area
<p>Fencing</p> <p>The proponent commits to installing fencing to protect the offset area. A fencing plan has been provided in Figure 5 of the OAMP as provided at Schedule 1.</p> <p>Consistent with the risk of excess grazing as identified in the Conservation Advice for the Squatter Pigeon (Southern).</p>	Install and routinely inspect fencing to secure the offset area and prevent unauthorised access.	All external boundaries of the offset area.. A fenced area may include non-offset areas.	<p>Fencing of offset areas will be established within three months of the Queensland Government approving the voluntary declaration.</p> <p>If stock are grazing the offset area or adjacent areas, fencing must be inspected monthly. During non-grazing periods, fencing must be inspected quarterly.</p>	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually.</p> <p>Quarterly inspections will identify if fences are preventing stock and unauthorised people from accessing the offset area.</p> <p>Fencing is to be checked and repaired (if necessary) to a stock proof condition within 10 days of any <i>Force Majeure</i> event.</p>	<p>Trigger for corrective action: detection of prohibited access, stock grazing outside of allowed times and thresholds, overgrazing. Damage to fencing that could allow unauthorised access to people or livestock.</p> <p>Corrective action: upon being notified or becoming aware of prohibited access to the offset area, the Landholder is to reassess fencing, signage and general access within one fortnight.</p> <p>Corrective action: upon being notified or becoming aware of an unsecure offset area (i.e. fencing is not fit for purpose), the Pastoral Manager is to undertake</p>

²⁴ *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#>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>fence maintenance and repairs to resecure the offset area as soon as possible and within 10 days. This corrective action may include the installation of new fencing.</p> <p>Reporting: the Offset Area Report will document the installation, maintenance and repair of fences during the reporting period. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
<p>Following extreme weather conditions of drought, flood or cyclone</p> <p>Consistent with the general risks as identified in Conservation Advice for the Squatter Pigeon (Southern). Drought is defined as the district or property being Drought Declared</p>	Determine the extent of damage to the offset area and fencing caused by the event.	Throughout the offset area with particular attention paid to riparian areas and the boundary fencing.	As soon as safely possible post a flood or cyclone event. For a drought event, inspections must be monthly.	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder within one week of the cessation of an extreme event on Wollombi Station.</p> <p>Within the abovementioned timeframe, fencing will be inspected to determine if the offset area is secure.</p> <p>During drought events, monthly inspections will be conducted to record the vegetation condition in the offset area.</p>	<p>Trigger for corrective action: extreme weather conditions of flood or cyclone</p> <p>Corrective action: upon being notified or becoming aware of a flood or cyclone event occurring in offset area, the Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area within one fortnight. Stock will be excluded following Force Majure rain events</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
by the Qld Government.					<p>Weed cover is to be monitored by the same methodology and at the same time as the grass cover and weed control undertaken post a fire event to ensure weed cover is <5%.</p> <p>Fencing is to be checked and repaired (if necessary) to a stock proof condition within 10 days of any <i>Force Majeure</i> event.</p>	<p>until soil is sufficiently dry to prevent pugging.</p> <p>Trigger for corrective action: extreme weather conditions of drought</p> <p>Corrective action: upon being notified or becoming aware of a drought event occurring in offset area, the Pastoral Manager is to remove stock from the offset area within 5 days.</p> <p>Reporting: the Offset Area Report will document the repair of fences and removal of stock from offset areas, as a result of extreme weather conditions, during the reporting period. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
<p>Grazing</p> <p>Consistent with the risk of excess grazing as identified in the Conservation Advice for the</p>	<p>Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions.</p> <p>The use of stock in larger numbers for a short period of</p>	<p>Stock will be grazed in the offset areas for fuel reduction purposes only during</p>	<p>As required when ground cover in non-remnant areas exceeds 60% during the dry season. Crash grazing events are only to be</p>	<p>Pastoral Manager, Landholder or suitable qualified person appointed by</p>	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least monthly during grazing periods.</p>	<p>Trigger for corrective action: detection of stock grazing outside of the dry season, or during the dry season exclusion period</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
Squatter Pigeon (Southern).	<p>time in the late dry season and prior to the wet season and if required, again during winter is the preferred method of controlled grazing.</p> <p>Throughout the offset area, management actions for fire and grazing are interlinked due to the necessity to manage increased fuel loads that will establish as a consequence of reduced grazing intensity. As canopy trees and the shrub layers in the offset area establish and mature, their resulting canopy cover will naturally diminish the fuel load as Buffel grass will decline in extent as the canopy cover increases. Until such time, intervention in the form of both low intensity grazing and infrequent low intensity ecological burns will achieve this outcome.</p> <p>The management actions seek to avoid adverse impacts by monitoring the offset area more frequently during grazing periods. Importantly, any sign of significant adverse impacts to low-lying offset areas as a result of stock use (e.g. pugging) will</p>	the dry season.	undertaken during December; however, if unseasonal rainfall should occur, then grazing is to be allowed only if there is no evidence of moisture in the stream order one gullies to ensure that "pugging" of the soil by livestock does not occur.	the Landholder.	<p>Monthly inspections will record the minimum grass cover, pasture biomass and security (i.e. fences) of the offset area.</p> <p>Monthly inspections will record the evidence of "pugging" in stream order one gullies.</p>	<p>Corrective action: upon being notified or becoming aware of prohibited stock grazing in the offset area, the Pastoral Manager is to remove the stock from the area (if present) and assess the adequacy of fencing within 10 days. The Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area within 10 days.</p> <p>Trigger for corrective action: in non-remnant areas ground cover is less than 60%.</p> <p>Corrective action: upon being notified or becoming aware of exceedance of the threshold, the Pastoral Manager is to remove stock from the offset area within 5 days. Grazing may recommence prior to the wet season if the ground cover increases to greater than 60% using methodology 2Bin the <i>Land Manager's Monitoring Guide (DERM, 2010)</i> as per Attachment 2 of the OAMP, or any</p>

	<p>trigger the removal of stock from the offset area.</p> <p>The allowance of stock to the offset area triggers a higher management intensity to mitigate the increased risk of adverse impacts. This management approach will identify adverse impacts as they arise and trigger corrective action/s as necessary. The success of stock grazing in the Squatter Pigeon (southern) offset area will become apparent during the first dry season under offset area management.</p>					<p>subsequent published version of this document.</p> <p>Trigger for corrective action: stock grazing occurs in the offset area during the dry season and ground cover falling below 60%.</p> <p>Corrective action: upon being notified or becoming aware that the ground cover drops below 60% during the dry season, the Pastoral Manager is to review and adapt stock grazing practices for the following dry season. Evidence of this review and outcome/s must be included in the Offset Area Report.</p> <p>Trigger for corrective action: detection of stock grazing causing pugging in stream order one gullies or significant adverse impacts to low-lying offset areas, all of which are to be inspected during the quarterly inspections</p> <p>Corrective action: upon being notified or becoming aware of stock causing pugging in stream order one gullies or significant adverse impacts to low-lying offset areas, the Pastoral Manager</p>
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Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
						<p>is to remove stock from the offset area within 72 hours.</p> <p>Corrective action: upon being notified or becoming aware of a drought event occurring in offset area, the Pastoral Manager is to remove stock from the offset area within 5 days.</p> <p>Reporting: The Offset Area Report will document the grazing periods that occurred in the offset areas during the reporting period and the correlating corrective actions that occurred as part of grazing management. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>
<p>Pest animals</p> <p>Consistent with the risk of habitat damage and predation identified in the Conservation Advice for the Squatter Pigeon (Southern).</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 <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld).</p> <p>Wild pig, deer and dog populations are generally small and highly transient, and</p>	All offset areas.	<p>Preferably in the winter and spring months to minimise impacts to the Squatter Pigeon (southern) during breeding and nesting.</p> <p>Destruction of wetland habitat by feral pigs is also a threat to the Ornamental Snake, along with the associated destruction</p>	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, 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 for to record the presence of wallow holes, tracks and visual incidents in the offset area. If detected, these areas will be GPS and</p>	<p>Trigger for corrective action: detection of twelve or more half grown and/or mature wild pigs, deer or dogs during a quarterly inspection.</p> <p>Corrective action: upon being notified or becoming aware of pest animal populations exceeding the threshold, the Pastoral Manager is to implement</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
	<p>therefore the scale of impact is small. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area. Current control of pigs and wild dogs is undertaken via a baiting program on the property. Additional to this measure, the Pastoral Manager, during quarterly inspections of the offset area may remove any wild pigs, deer or wild dogs that are seen. If an increase in pig, deer or dog activity is noted, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.</p> <p>There was no evidence of extensive damage from deer, foxes, rabbits or wild cats detected during surveys as part of the Environmental Impact Assessment, however, if the occurrence of these animals is detected, a control program integrated with that for wild pigs and dogs will be implemented.</p>		<p>of frog habitat and direct competition for their food source (frogs).</p> <p>When a group of animals is observed, a control program will be implemented. The timing of control program will address the threats to both species.</p>		<p>photographed and rechecked at the next quarterly inspection.</p> <p>Note: baseline levels for pest animals are not able to be established due to the transient nature of the animals. Numbers are established via visual signs recorded during quarterly inspections.</p>	<p>pest control measures within one month. The Pastoral Manager or Landholder may approach neighbouring landowners to discuss the increased pest animal presence and an integrated control program may be developed.</p> <p>Reporting: the Offset Area Report will document the indications or sightings of pest animals during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing to the enhancement of the offset area.</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
<p>Pest plants (i.e. weeds)</p> <p>Consistent with the risk of excess fire from excessive weed cover as identified in the Conservation Advice for the Squatter Pigeon (Southern)</p>	<p>Keep the introduction, establishment and spread of non-native weeds including Declared Pest Plants listed under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld) to less than 10% weed cover in the offset area.</p> <p>Control existing infestations of non-native weeds including declared pest plants under the <i>Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld) to ensure that the non-native weeds cover less than 10% of the offset area (e.g., Parthenium).</p> <p>Buffel Grass is recognised as being a threat to the vegetation communities and habitat in the offset area however is not referred to as a weed as it is not declared in <i>the Land Protection (Pest and Stock Route Management) Act 2002</i> (Qld). Control measures such as grazing and increasing canopy cover of vegetation are included in this plan to decrease the extent of Buffel Grass over time. Control of Buffel Grass is best managed via grazing during the</p>	Throughout the offset area	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.	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder.	<p>Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually. Weed cover is to be monitored by the same methodology and at the same time and at the same time as the grass cover measurements.</p> <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. The field data sheets provided in Appendix A may assist with documenting weed presence and control measures.</p> <p>Quarterly inspections will be conducted by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder to record the ground cover in the offset area. The following ground cover is to be present at the end of the dry season which is to be at the minimum of 60% at the end of the dry season.</p>	<p>Trigger for corrective action: pest plants occur in greater than 10% of the offset area</p> <p>Corrective action: upon being notified or becoming aware of pest plants being present in greater than 5% of the offset area, the Pastoral 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; • stem injection; • cut stump; • cut and swab; • stem scraper; and • wick applicators. <p>Reporting: the Offset Area Report will document the weed presence and weed control measures during the reporting period and the correlating corrective actions. The report will document how this management action is performing and contributing</p>

Management action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action	Monitoring scope, frequency and timing	Triggers, corrective actions and performance reporting
	<p>dry season and increasing tree canopy cover.</p> <p>Spot spraying of patches of Parthenium is permitted.</p>					<p>to the enhancement of the offset area.</p>

6 MONITORING AND REPORTING

6.1 Wollombi Station

Regular monitoring and reporting will be provided to the regulator to demonstrate active and responsive management of the offset area by Byerwen Coal. As a minimum, the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder will inspect Wollombi Station and the offset area on a quarterly basis. More frequent inspections will be triggered in accordance with **Table 7** (e.g. if the offset area is used for stock grazing or an extreme event such as flood, fire or drought occurs). Observations, subsequent corrective actions and incidences of fire, unauthorised access, fence maintenance, pest animals, pest plants and grazing will be recorded during the inspections. The Offset Area Report will capture this inspection data along with annual photo point records, rainfall records and any other information deemed relevant to the management of the offset area during the twelve-month reporting period. The submission of the Offset Area Report to the regulator is the responsibility of Byerwen Coal.

In addition to the Offset Area Report, Byerwen Coal will complete an assessment of the offset area ecological condition in years 2020, 2025, 2030, 2035, 2040 and 2044. The assessment will utilise the same baseline assessment methodology - the *Guide to determining terrestrial habitat quality: a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy, (version 1.1 December 2014)* (DEHP 2014²⁵). This methodology determines habitat quality based on site condition, site context and species habitat index, and is based on the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland* (Queensland Herbarium, Department of Science, Information Technology, Innovation and Arts 2015).²⁶The assessment may also use any subsequently published methodology that captures the required scope of information. Each assessment will be conducted at the same locations as the 2015/16 baseline measurements and the annual photo points, which are the same locations as the baseline data collected and incorporated into the EPBC Act *Offset Assessment Guide*. An additional biocondition monitoring point will be allocated within the additional offset area where squatter pigeon surveys will be undertaken in conjunction with biocondition monitoring to demonstrate uplift in stocking rates. The location of the monitoring sites is shown in **Figure 7**. These monitoring actions provide a record of comparability over the term of the offset and the overall progress of the offset vegetation communities and habitat improving in condition. The schedule of monitoring and reporting is stated in **Table 8**.

Table 8A: Schedule of monitoring and reporting – offset area, Wollombi Station

Monitoring	Attributes monitored	Frequency	Method	Location/s
Surveys undertaken by Ecologists				
Baseline assessment	Refer 'ecological condition' below	Completed in 2015/16 and is an input into the OAMP	Field observations, vegetation assessment as per the <i>Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1</i>	Sites listed at Table 10 of the OAMP.

²⁵ *Guide to determining terrestrial habitat quality - A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy*. Department of Environment and Heritage Protection, Queensland Government, Brisbane, available at <http://www.ehp.qld.gov.au/assets/documents/pollution/management/offsets/habitat-quality-assessment-guide.pdf>

²⁶ <https://www.qld.gov.au/environment/assets/documents/plants-animals/biodiversity/biocondition-assessment-manual.pdf>

Monitoring	Attributes monitored	Frequency	Method	Location/s
			December 2014) (DEHP, 2014).	
Ecological condition assessment	Recruitment of woody perennial species in EDL	Early dry season (June or July) in years 2020, 2025, 2030, 2035, 2040 and 2044	Field observations, vegetation assessment as per the <i>Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1 December 2014)</i> (DEHP, 2014)*. Data for each of the ecological condition attributes monitored will be collected at each site listed in Table 10 of the OAMP and reported on and presented in a sequential manner (including previous data collected) to quantify change from the benchmark collected in 2015/16. This will record the change in each attribute measured and hence the condition of the ecological community and habitat, thus enabling a statistical comparison to previous years' data and the progression of the offset site condition and EPBC Act Offset Assessment Guide Calculator inputs.	Sites listed at Table 10 of the OAMP.
	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			
	Organic litter			
	Large trees			
	Coarse woody debris			
	Non-native plant cover			
Non-remnant or remnant status				
Squatter pigeon survey	As per the EPBC Act guidelines	Early dry season (June or July) in years 2020, 2025, 2030, 2035, 2040 and 2044.	As per the EPBC Act guidelines	Sites listed at Table 10 of the OAMP.
Landholder/Pastoral Manager/Authority Holder Records <i>Record keeping commences within three months of the Queensland Government approving the voluntary declaration</i>				
Photo points	General vegetation condition	Annually in the early dry season (June or July) until, and including, May 2044	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder will undertake quarterly	Sites listed at Table 10 of the OAMP.
Grazing	Stocking rates	Monitored monthly during grazing periods		Within Offset Areas

Monitoring	Attributes monitored	Frequency	Method	Location/s
	Ground cover Pugging of the soil by livestock	and reported annually until, and including, May 2044	inspections of the offset area to observe and record grass cover levels, pest plants, accessibility (i.e. condition of fencing), signage, evidence of fire and evidence of pest animal incursion. The inspection records will serve as the primary data source for the Offset Area Report. Photo points to be undertaken as per the method described in the <i>Land Manager's Monitoring Guide</i> (DERM, 2010) (or any subsequent published version of this document) provided at Attachment 2 of the OAMP,	
Fire	Occurrence/triggers , corrective actions, timing and result of the control measures	Monitored quarterly and reported annually until, and including, May 2044		
Pest plants	Occurrence/triggers , corrective actions, timing and result of the control measures	Monitored quarterly and reported annually until, and including, May 2044		
Pest animals	Occurrence/triggers , corrective actions, timing and result of the control measures	Monitored quarterly and reported annually until, and including, May 2044		
Access and signage	Occurrence/triggers , corrective actions, timing and result of the control measures	Monitored quarterly and reported annually until, and including, May 2044		

Table 8B: Schedule of monitoring and reporting – additional squatter pigeon offset area, Wollombi Station

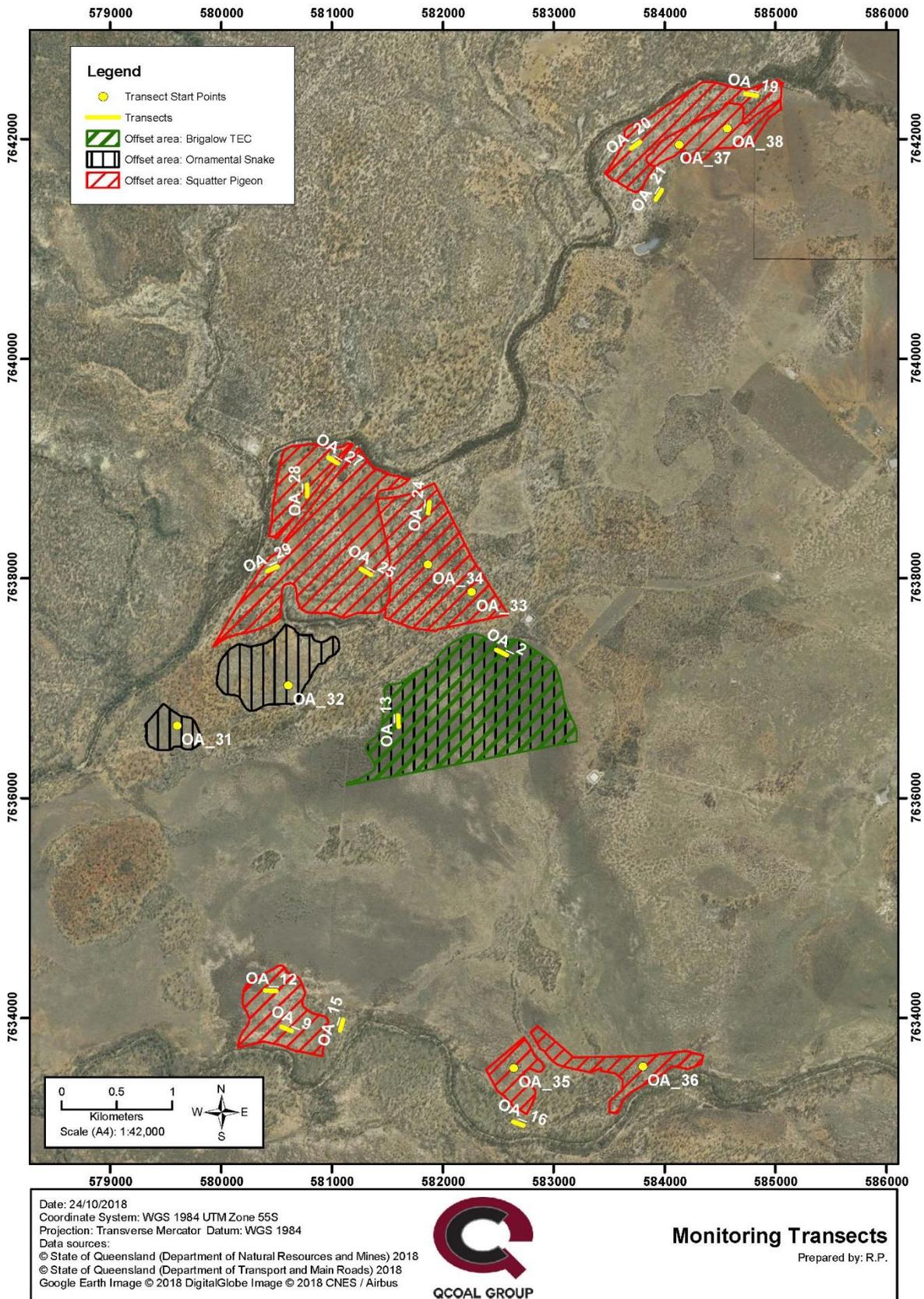
Monitoring	Attributes monitored	Frequency	Method	Location/s
Surveys undertaken by Ecologists				
Baseline assessment	Refer 'ecological condition' below	Completed in 2015/16 and is an input into the OAMP A baseline survey for weeds and Squatter Pigeon (as per the Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2) populations will be undertaken by June 2019 and the results included in the first Annual Report.	Field observations, vegetation assessment as per the <i>Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1 December 2014)</i> (DEHP, 2014).	Sites listed at <i>Table 10</i> of the OAMP.
Ecological condition assessment	Recruitment of woody perennial species in EDL	Early dry season (June or July) in years 2020, 2025, 2030, 2035, 2040 and 2044	Field observations, vegetation assessment as per the <i>Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1 December 2014)</i> (DEHP, 2014)*. Data for each of the ecological condition attributes monitored will be collected at each site listed in <i>Table 10</i> of the OAMP and reported on and presented in a sequential manner (including previous data collected) to quantify change from the benchmark collected in 2015/16. This will record the change in each attribute measured and hence the condition of the ecological community	Sites listed at <i>Table 10</i> of the OAMP.
	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			
	Organic litter			
	Large trees			
	Coarse woody debris			
Non-native plant cover				

Monitoring	Attributes monitored	Frequency	Method	Location/s
	Non-remnant or remnant status		and habitat, thus enabling a statistical comparison to previous years' data and the progression of the offset site condition and EPBC Act Offset Assessment Guide Calculator inputs.	
Ground cover	Ground cover	Annually in the early dry season (June or July) for the first five years, and biennially for the remainder of the approval period.	As per the <i>Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1 December 2014)</i> (DEHP, 2014)*.	Sites listed at Table 10 of the OAMP
Squatter pigeon survey	Squatter pigeon populations	Early dry season (June or July) in years 2020, 2025, 2030, 2035, 2040 and 2044	As per the Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2	Sites listed at Table 10 of the OAMP.
Quarterly Landholder/Pastoral Manager/Authority Holder Records and monitoring <i>Record keeping commences within three months of the Queensland Government approving the voluntary declaration</i>				
Photo points	General vegetation condition	Annually in the early dry season (June or July) until, and including, May 2044	Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder will undertake quarterly inspections of the offset area to observe and record grass cover levels, pest plants, accessibility (i.e. condition of fencing), signage, evidence of fire and evidence of pest animal incursion. The inspection records will serve as the primary data source for the Offset Area Report.	Sites listed at Table 10 of the OAMP.
Grazing	Stocking rates Grass cover Pasture biomass Pugging of the soil by livestock	Monitored monthly during grazing periods and reported annually until, and including, May 2044 <i>Level 1 monitoring as per the Land Manager's Monitoring Guide (DERM, 2010)</i>		Within Offset Areas
Fire	Occurrence/triggers, corrective actions, timing and result of the control measures. as per Table 8.	Monitored quarterly and reported annually until, and including, May 2044		
Pest plants	Occurrence/triggers, corrective actions, timing and result of the control measures. as per Table 8.	Monitored quarterly and reported annually until, and including, May 2044. Weed cover is to be monitored by the same methodology and at the same time and at the	Photo points and monitoring is to be undertaken as per the	

Monitoring	Attributes monitored	Frequency	Method	Location/s
		same time as the grass cover measurements.	<i>Level 1 monitoring in the Land Manager's Monitoring Guide (DERM, 2010)</i> (or any subsequent published version of this document) provided at Attachment 2 of the OAMP,	
Pest animals	Occurrence/triggers, corrective actions, timing and result of the control measures. as per Table 8.	Monitored quarterly and reported annually until, and including, May 2044. Quarterly inspections will involve traversing the offset area with streams, low lying areas and vehicle access tracks being noted for to record the presence of wallow holes, tracks and visual incidents in the offset area. If detected, these areas will be GPS and photographed and rechecked at the next quarterly inspection.		
Access and signage	Occurrence/triggers, corrective actions, timing and result of the control measures as per Table 8.	Monitored quarterly and reported annually until, and including, May 2044		

*A methodology for assessing ecological condition published subsequent to the *Guide to determining terrestrial habitat quality – a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (version 1.1 December 2014)* (DEHP, 2014) that captures the required scope of information may be used.

Figure 7: Location of monitoring sites



6.2 Performance indicators and milestones

The management actions in **Table 7** will enhance the habitat quality throughout the offset area. Each scheduled ecological condition assessment will be the tool to compare the habitat quality to previous surveys and assess performance of the offset area. **Table 9** details the performance indicators and milestones for the offset area.

The results of the monitoring program will inform adaptive management of the offset area so that over time there will be no net loss to the extent and condition of the ecological community and habitat. The monitoring will demonstrate an improvement over time of the ecosystem functionality and condition for the Brigalow ecological community and habitat for the Ornamental Snake, Squatter Pigeon (southern) as defined in the relevant Approved Conservation Advices.

Table 9: Performance indicators and milestones – offset area, Wollombi Station

Offset area value/s	Performance indicator/s	Milestone/s	Reporting
Brigalow TEC	Habitat quality measurements: <ul style="list-style-type: none"> Site condition Site context Species stocking rate 	<ul style="list-style-type: none"> Site condition = 3.5 Site context = 2.0 Species stocking rate = 2.5 Meets the requirements of remnant vegetation 	The ecological condition assessment completed in years 2020, 2025, 2030 2035, 2040 and 2044 will compare the habitat quality to previous surveys and assess performance of the offset area.
Squatter Pigeon (southern)	Habitat quality measurements: <ul style="list-style-type: none"> Site condition Site context Species stocking rate 	<ul style="list-style-type: none"> Site condition = 3.5 Site context = 3.0 Species stocking rate = 1.5 Meets the requirements of remnant vegetation 	
Ornamental Snake	Habitat quality measurements: <ul style="list-style-type: none"> Site condition Site context Species stocking rate 	<ul style="list-style-type: none"> Meets the requirements of remnant vegetation <p>For the non-remnant RE 11.4.9, polygon 32 and part of polygon 30 offset area:</p> <ul style="list-style-type: none"> Site condition = 3.5 Site context = 3.5 Species stocking rate = 2.0 <p>For the non-remnant RE 11.4.9, polygons 39 and 43 offset area:</p> <ul style="list-style-type: none"> Site condition = 3.0 Site context = 3.5 Species stocking rate = 1.5 	
General	Unauthorised forestry operations, native timber harvesting and general vegetation impacts have not occurred	Only authorised vegetation impacts have occurred	The annual Offset Area Report will evaluate the general performance indicators and milestones for the offset area.

Offset area value/s	Performance indicator/s	Milestone/s	Reporting
	Access and signage is fit for purpose	Access and signage is installed and maintained	
	Unauthorised fire/s have not occurred	Only authorised fire impacts have occurred	
	Extreme weather conditions have been appropriately managed	Corrective actions are undertaken	
	Grazing has occurred only as permitted	Only authorised grazing impacts have occurred	
	Pest animal populations are low	Pest animal impacts are not significantly detrimental to the habitat quality of the offset area	
	Pest plant presence is low	Pest plant presence is less than 10% in the offset area	

7 GOVERNANCE ARRANGEMENTS

7.1 Wollombi Station

The site will be managed as per the OAMP (**Schedule 1**). The key risks and corresponding management and corrective actions from the management plan are detailed at Section 4 of the OAMP. The monitoring and reporting will be undertaken to verify the management actions have been completed and that the offset area is improving. The OAMP is attached to the title of the property via a Voluntary Declaration under the VMA which provides the Queensland Government legislative powers to oversee the implementation of the offset area.

SCHEDULE 1 – OFFSET AREA MANAGEMENT PLAN – WOLLOMBI STATION

Please refer to PDF file supplied separately.

SCHEDULE 2 - LEGAL SECURITY

Schedule 2A – Title Search Wollombi Station

CURRENT STATE TENURE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 24036440
Search Date: 16/08/2016 09:27

Title Reference: 17650102
Date Created: 21/10/1995

DESCRIPTION OF LAND

Tenure Reference: GHPL 30/4120

Lease Type: PERPETUAL

LOT 1 SURVEY PLAN 278043
Local Government: ISAAC

Area: 9831.563900 Ha. (SURVEYED)

No Land Description

No Forestry Entitlement Area

Purpose for which granted:
NO PURPOSE DEFINED

TERM OF LEASE

Day of beginning of lease

Lease in perpetuity commencing on 01/01/1986

REGISTERED LESSEE

Dealing No: 715032179 12/04/2013

CHRISTOPHER IAN WALLIN

CONDITIONS

- M76 The Lessee shall not at any time permit or allow any *Harrisia Cactus* growing upon any part of the leased land in respect of which the Lessee shall have commenced to perform or comply with the requirements of a Notice to Destroy *Harrisia Cactus* under Section 261 of the Land Act 1962-1986 to bear and produce flower or ripened fruit.
- M76 The Lessee shall during the whole term of the lease maintain all improvements on the holding existing at the commencement thereof in a good and substantial state of repair.

CURRENT STATE TENURE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 24036440

Search Date: 16/08/2016 09:27

Title Reference: 17650102

Date Created: 21/10/1995

ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Lease No. 17650102
2. EASEMENT IN GROSS No 708559649 06/04/2005 at 11:04
burdening the land
ENERTRADE (NQ) PIPELINE NO 1 PTY LTD A.C.N. 100 946 281
ENERTRADE (NQ) PIPELINE NO 2 PTY LTD A.C.N. 100 946 263
over
EASEMENTS K AND L ON SP175265
3. EASEMENT IN GROSS No 711632779 08/05/2008 at 15:54
burdening the land
SUNWATER A.B.N. 17 020 276 523
over
EASEMENTS H AND I ON SP195383
4. EASEMENT IN GROSS No 716938664 08/12/2015 at 11:21
burdening the land
SUNWATER LIMITED A.C.N. 131 034 985
over
EASEMENT Y ON SP278043
5. EASEMENT IN GROSS No 716938669 08/12/2015 at 11:22
burdening the land
NORTH QUEENSLAND PIPELINE NO 1 PTY LTD A.C.N. 100 946 281
TENANT IN COMMON 1/2
NORTH QUEENSLAND PIPELINE NO 2 PTY LTD A.C.N. 100 946 263
TENANT IN COMMON 1/2
over
EASEMENT Z ON SP278043

ADMINISTRATIVE ADVICES

Dealing	Type	Lodgement Date	Status
712013698	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	29/10/2008 09:01	CURRENT
712054177	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	18/11/2008 14:05	CURRENT
712062861	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	21/11/2008 13:13	CURRENT
713429683	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	26/08/2010 12:00	CURRENT
715654165	STRTGIC LAND STRATEGIC CROPPING LAND ACT 2011	13/03/2014 14:44	CURRENT

UNREGISTERED DEALINGS - NIL

Schedule 2B – Request for Voluntary Declaration – Wollombi Station

Department of Natural Resources and Mines

Request for a Voluntary Declaration

Vegetation Management Act 1999

Section 1 - Proponent details

The proponent is the owner of the land and may comprise of more than one person where there is joint ownership of land -

Owner, of land includes -

- (a) for freehold land - the registered owner; or
- (b) for a lease, license or permit under the Land Act 1994 - the lessee, licensee or permittee; or
- (c) for indigenous land - the holder of title to the land; or
- (d) for any tenure under any other Act - the holder of the tenure.

Extra pages may be attached to list additional owners.

All correspondence will be directed to the 'contact person'.

Purpose(s) of declaration

- participating in a conservation incentives program(s) carbon emission offsetting
 to offset clearing associated with a development approval other conservation purposes

Owner/s of land

Title	Family name	Given name
Mr	Wallin	Christopher

Name of Company/Organisation (if the owner is a company)

ACN (if applicable)

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Contact person

Title	Family name	Given name
Mr	Pane	Ryan

Phone number Mobile number Fax number

(07) 3002 2900		
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Address

PO Box 10630, Brisbane QLD
Postcode 4000

Section 2 - Property Description and Tenure

This is the property on which the voluntary declaration area is proposed. The vegetation management plan should indicate the specific location of the proposed declared area on the property.

Extra pages may be attached to list additional lots.

Tenure of property(ies) containing proposed declaration area.

Parcel (lot and plan)	Owner/s	Tenure (e.g. Freehold, Grazing Homestead Perpetual Lease)
Lot 1 on SP278043	Christopher Wallin	Grazing Homestead Perpetual Lease

Great state. Great opportunity.



Section 3 - Registered interest holders in proposed declaration area

A registered interest is one registered under the Land Act 1994 or the Land Title Act 1994.

Registered interests are mortgages, leases, subleases, covenants, profit a prendes, easements and building management statements.

A declaration may not be made unless the holder of a registered interest (other than the proponent) in the proposed declaration area has consented in writing to the making of the declaration.

NOTE: Section 3 only requires the recording of registered interest holders- consent of registered interest holders is not required as part of the request. The proponent will need to seek written consent to the declaration of all registered interest holders once the Department has considered the request, and prior to the making of any declaration.

Extra pages may be attached to list additional lots and/or registered interest holders.

Parcel (lot and plan)	Type of Registered Interest	Registered interest holder's name and contact details
Lot 1 on SP278043	Easement - Pipeline	Enertrade (NQ) Pipeline No 1 Pty Ltd
Lot 1 on SP278043	Easement - Pipeline	Enertrade (NQ) Pipeline No 2 Pty Ltd
Lot 1 on SP278043	Easement - Pipeline	Sunwater Limited

Section 4 - Type of declaration request

Specify the type of declaration that is requested, and the relevant criteria for the declaration. One or more of the criteria may be applicable to the area being sought for declaration.

The proponent must provide an explanation of how the declared area meets the criteria selected in this section. This explanation must be provided in the documents accompanying the request. The 'Guide to voluntary declarations under the *Vegetation Management Act 1999*' may be viewed for assistance in preparing a request.

- Area of high nature conservation value
- a wildlife refugium
 - a centre of endemism
 - an area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity
 - an area that makes a significant contribution to the conservation of biodiversity
 - an area that contributes to the conservation value of a wetland, lake or spring.
 - another area that contributes to the conservation of the environment

OR

- Area vulnerable to land degradation
- soil erosion
 - rising water tables
 - the expression of salinity, whether inside or outside the area
 - mass movement by gravity of soil or rock
 - stream bank instability
 - a process that results in declining water quality

Section 5 - Management Plan

The Management Plan must contain all the components identified in this section. The Management Plan is to refer to the area identified in section 2 of this form. The Management Plan may also include any other information the applicant considers will assist in the determination of the request. For more information on the Management Plan, consult the Guide to Voluntary Declarations and the Management Plan template.

A Management Plan must accompany all voluntary declaration requests. The attached Management Plan

- contains the proponent's signature
- includes enough information to allow the chief executive to map the boundary of the stated area
- states the proponent's management intent, and management outcomes proposed by the proponent, for the conservation of the high nature conservation value of the area or the prevention of land degradation in the area
- states the activities the proponent intends to carry out, or refrain from carrying out, to achieve the stated management outcomes
- states the restrictions, if any, to be imposed on the use of, or access to, the area by other persons to achieve the stated management outcomes

Page 2 of 3

Section 6 - Information privacy statement

The Department of Natural Resources and Mines (DNRM) is collecting the information in this form and any attachments to process your request that the chief executive declare a stated area of land under the *Vegetation Management Act 1999*. The consideration of your request may involve consultation, and if so, details of your request and any attachments may be disclosed to third parties. These details will not otherwise be disclosed outside DNRM unless required or authorised by law.

Section 7 - Signature/s

The owner(s) of the land (proponent) must sign and date this section

If there are more than four owners, extra pages may be attached with a copy of the 'statement' with the signature(s).

A company:

- may execute a document without using a common seal if the document is signed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director; or
- with a company seal may execute a document if the seal is fixed to the document and the fixing of the seal is witnessed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director.

Statement

I/We

- consent to the collection and use of the personal information in this form for the purposes of assessing this request for a voluntary declaration under the *Vegetation Management Act 1999*; and
- declare that the information provided by me/us is true and correct

Proponent (Owner's) signature

Date

Company seal (if applicable)

Proponent (Owner's) signature

Date

Proponent (Owner's) signature

Date

Proponent (Owner's) signature

Date

Office use only

Date received

Receiving officer

Reference number

SCHEDULE 3 – OFFSET ASSESSMENT GUIDE CALCULATOR RESULTS

Schedule 3A – Brigalow (RE 11.3.1/11.4.9)

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Brigalow (Acacia harpophylla)
EPBC Act status	Endangered
Annual probability of extinction <small>Based on IUCN category definitions</small>	1.2%

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

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source	
<i>Ecological communities</i>						
Area of community <input type="button" value="Clear row"/>	Yes	This portion of Brigalow TEC in the impact area, is comprised of REs 11.3.1 and 11.4.9. This vegetation ranges in size from 3.14ha to 59.9ha in size. Some are fragmented and some are connected to	Area	78.8	Hectares	1. Byerwen Coal Project: Biodiversity Offset Strategy (Earthtrade 2015). 2. Field survey consistent with the Guide to determining terrestrial habitat quality: a toolkit for assessing land based offsets under the Queensland Environmental
			Quality	6	Scale 0-10	
			Total quantum of impact	47.28	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat <input type="button" value="Clear row"/>	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
<i>Threatened species</i>						
Birth rate e.g. Change in nest success <input type="button" value="Clear row"/>	No					
Mortality rate e.g. Change in number of road kills per year <input type="button" value="Clear row"/>	No					
Number of individuals e.g. Individual plants/animals <input type="button" value="Clear row"/>	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community <input type="button" value="Clear row"/>	Yes	47.28	Adjusted hectares	The proposed offset area is located on Wollombi Station (lot 1 on SP278043) and situated adjacent to a 3.6km stretch of the Sutor River riparian corridor. The offset is 9km to the south-west of the Stage 1 impact area. Refer to Table 5, Section 3.1.1.	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	100	Risk of loss (%) without offset	100%	Risk of loss (%) with offset	5%	Raw gain	95.00	Confidence in result (%)	80%	Adjusted gain	76.00	Net present value (adjusted hectares)	59.87	% of impact offset	47.90	101.30%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source	
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	95.0	Raw gain	4.00	Confidence in result (%)	80%	Adjusted gain	3.20	Net present value (adjusted hectares)	2.84													
					Time until ecological benefit	10	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	8																	
<i>Threatened species habitat</i>																													
Area of habitat <input type="button" value="Clear row"/>	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)		% of impact offset		Minimum (90%) direct offset requirement met?		Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0	Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)														
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)																		
<i>Threatened species</i>																													
<i>Threatened species</i>																													
Birth rate e.g. Change in nest success <input type="button" value="Clear row"/>	No																												
Mortality rate e.g. Change in number of road kills per year <input type="button" value="Clear row"/>	No																												
Number of individuals e.g. Individual plants/animals <input type="button" value="Clear row"/>	No																												

Schedule 3B – Brigalow (RE 11.4.8 and 11.9.1)

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Brigalow (Acacia harpophylla)
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

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

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source	
<i>Ecological communities</i>						
Area of community <input type="button" value="Clear row"/>	Yes	This Brigalow TEC in the impact area, is comprised of RE 11.4.8 and a very small component of RE 11.9.1. This vegetation ranges in size from 3.1ha to 26.6 ha in size. Some are fragmented some are connected to	Area	44	Hectares	1. Byerwen Coal Project: Biodiversity Offset Strategy (Earthtrade 2015). 2. Field survey consistent with the Guide to determining terrestrial habitat quality: a toolkit for assessing land based offsets under the Queensland Environmental
			Quality	7	Scale 0-10	
			Total quantum of impact	30.80	Adjusted hectares	
<i>Threatened species habitat</i>						
Area of habitat <input type="button" value="Clear row"/>	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species</i>						
<i>Birth rate</i>						
<i>Mortality rate</i>						
<i>Number of individuals</i>						

Offset calculator																														
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source														
<i>Ecological Communities</i>																														
Area of community <input type="button" value="Clear row"/>	Yes	30.80	Adjusted hectares	The proposed offset area is located on Wollombi Station (lot 1 on SP278043) and situated adjacent to a 3.6km stretch of the Sattor River riparian corridor. The offset is 9km to the south-west of the Stage 1 impact area. Refer to Table 5, Section 3.1.1.	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	65	Risk of loss (%) without offset	100%	Risk of loss (%) with offset	5%	Raw gain	61.75	Confidence in result (%)	80%	Adjusted gain	49.40	Net present value (adjusted hectares)	38.91	% of impact offset	101.08%	Minimum (90%) direct offset requirement met?	Yes	Cost (\$ total)		Information source			
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	61.8	Raw gain	4.00	Confidence in result (%)	80%	Adjusted gain	3.20	Net present value (adjusted hectares)	2.84														
					Time until ecological benefit	10	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	8																		
<i>Threatened species habitat</i>																														
Area of habitat <input type="button" value="Clear row"/>	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset		Raw gain		Confidence in result (%)		Adjusted gain		Net present value (adjusted hectares)		% of impact offset		Minimum (90%) direct offset requirement met?		Cost (\$ total)		Information source			
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																						
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)																			
<i>Threatened species</i>																														
<i>Birth rate</i>																														
<i>Mortality rate</i>																														
<i>Number of individuals</i>																														

Schedule 3E – Squatter pigeon (southern) - non-remnant REs 11.3.2, 11.3.4, 11.5.3, 11.5.9

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012
This guide relies on Macros being enabled in your browser.

Master of National Environmental Significance	
Name	Squatter Pigeon (southern)
EPBC Act status	Vulnerable
Annual probability of extinction based on IUCN category definitions	0.2%

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

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	Pre-remnant vegetation mapping found that of the REs outlined in the BOS as providing habitat for the Squatter Pigeon, only remnant RE 11.5.4 was present in the Stage 1 impact area. Connectivity of the habitat to the south is limited.	Area	141.8	Hectares
			Quality	7	Scale 0-10
			Total quantum of impact	99.26	Adjusted hectares
<i>Threatened species</i>					
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																		
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source		
<i>Ecological Communities</i>																		
Area of community	No				Risk related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset										
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)	0.0	0.0								
							Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)										
<i>Threatened species habitat</i>																		
Area of habitat	Yes	99.26	Adjusted hectares	The proposed offset area is located on Wollombi Station (Lot 1 on SP27043) - refer to Table 6, Section 3.1.2. This offset area is comprised of non-remnant REs 11.3.2 (polygon 34), 11.3.4 (polygons 45, 46 & 57), 11.5.3 (polygons 58, 59) & 11.5.9 (polygons 41, 56 & 57).	Time over which loss is averted (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset										
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)	0.0	179.6	179.55	80%	143.64	138.01	110.41	111.23%	Yes	
							Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	5	8	3.00	80%	2.40	2.38				
<i>Threatened species</i>																		
Birth rate e.g. Change in nest success	No																	
Mortality rate e.g. Change in number of road kills per year	No																	
Number of individuals e.g. Individual plants/animals	No																	

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	99.26	110.41	111.23%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

Schedule 3F- Squatter pigeon (southern) – remnant RE 11.3.2 and 11.5.3

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Squatter Pigeon (southern)
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

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

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community <input type="button" value="Clear row"/>	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat <input type="button" value="Clear row"/>	Yes	Field-validation of vegetation mapping found that of the REs outlined in the BOS as providing habitat for the Squatter Pigeon, only remnant RE 11.7.4 was present in the Stage 1 impact area. Connectivity of this habitat to the	Area	141.8	Hectares
			Quality	7	Scale 0-10
			Total quantum of impact	99.26	Adjusted hectares
1. Byerwen Coal Project: Biodiversity Offset Strategy (Earthtrade 2015). 2. Field survey consistent with the Guide to determining terrestrial habitat quality: a toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
Number of features e.g. Nest hollows, habitat trees <input type="button" value="Clear row"/>	No				
Condition of habitat Change in habitat condition, but no change in extent <input type="button" value="Clear row"/>	No				
<i>Threatened species</i>					
Birth rate e.g. Change in nest success <input type="button" value="Clear row"/>	No				
Mortality rate e.g. Change in number of road kills per year <input type="button" value="Clear row"/>	No				
Number of individuals e.g. Individual plants/animals <input type="button" value="Clear row"/>	No				

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset	0.0	0.0									
							Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)											
							Time until ecological benefit	Start quality (scale of 0-10)									Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	
<i>Threatened species habitat</i>																			
Area of habitat	Yes	99.26	Adjusted hectares	The proposed offset area is located on Wollombi Station (Lot 1 on SP278043) - refer to Table 6, Section 3.1.2. This offset area is comprised of remnant REs 11.3.2 (polygons 47, 50, 53 & 54).	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	9.25	Risk of loss (%) without offset	30%	Risk of loss (%) with offset	5%	2.31	80%	1.85	1.78	2.96	2.98%	No
									Future area without offset (adjusted hectares)	6.5	Future area with offset (adjusted hectares)	8.8							
									Time until ecological benefit	5	Start quality (scale of 0-10)	7							
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
Number of features e.g. Nest hollows, habitat trees	No																		
Condition of habitat Change in habitat condition, but no change in extent	No																		
<i>Threatened species</i>																			
Birth rate e.g. Change in nest success	No																		
Mortality rate e.g. Change in number of road kills per year	No																		
Number of individuals e.g. Individual plants/animals	No																		

Schedule 3G- Squatter pigeon (southern) Additional Offset – non-remnant RE 11.3.2, 11.4.8, 11.4.9 and 11.5.3

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012
This guide relies on macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Southern Pigeon (southern)
EPBC Act status	Valuable
Annual probability of extinction <small>(based on IUCN category definitions)</small>	0.2%

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

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	Additional impact on Squatter Pigeon habitat	Area	73 Hectares	1. Eyrewan Coal Project Biodiversity Offset Strategy (Eyrewan 2015). 2. Field survey consistent with the Guide to determining terrestrial habitat quality: a toolkit for assessing land-based offsets under the Queensland Environmental Offsets Policy, Version 1.2
			Quality	7 Scale 0-10	
			Total quantum of impact	51.10 Adjusted hectares	
<i>Threatened species</i>					
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
<i>Ecological Communities</i>																
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset								
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)								
					20	6	0.0	0.0								
<i>Threatened species habitat</i>																
Area of habitat	Yes	51.10	Adjusted hectares	Additional non-remnant habitat (values given in BOMF and justification table)	Time over which loss is averted (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset								
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)								
					20	6	219.7	219.7	219.7	219.7	0.00	90%	0.00	0.00	53.83	105.34%
<i>Threatened species</i>																
Number of features e.g. Nest hollows, habitat trees	No															
Condition of habitat Change in habitat condition, but no change in extent	No															
Birth rate e.g. Change in nest success	No															
Mortality rate e.g. Change in number of road kills per year	No															
Number of individuals e.g. Individual plants/animals	No															

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	51.1	53.83	105.34%	Yes	\$0.00	N/A	\$0.00
Area of community	0				\$0.00		\$0.00
					\$0.00	\$0.00	\$0.00

APPENDIX A1: FIELD SURVEY REPORT – WOLLOMBI STATION

Please refer to pdf file supplied separately.

APPENDIX A1-A: ADDITIONAL INFORMATION FOR BRIGALOW POLYGONS 30 AND 32

Proposed Brigalow Offsets on Wollombi Station

Please note that the metrics provided in Table 1 clearly identify the inherent value of the patches of non-remnant vegetation that have been proposed as offsets for impacts to Brigalow TEC and habitat for Ornamental Snake. This information has been retrieved from the field data sheets for the four EEM sites that are located within the proposed offset areas.

The corresponding photographs that were taken at these locations have also been provided.

Table 1: Critical metrics of Brigalow regrowth in polygons 30 and 32 of the OMP

Assessment Site	Polygon No.	Vegetation Type	Composite Species of ecologically dominant layer (EDL) [d = dominant, a = associated, s = suppressed]	EDL		Weed Cover		Photos
				Height (m)	Cover (%)	Absolute	As % of total vegetative cover	
EEM_OA_02	32	n-r 11.4.9	d - <i>Acacia harpophylla</i> ; a - <i>Terminalia oblongata</i> (groundcover dominated by native sedges indicating periods of prolonged inundation)	2.05	42.38	0.1	0.2	7404-9
EEM_OA_13			d - <i>Acacia harpophylla</i> ; a/s - <i>Terminalia oblongata</i> ; s - <i>Lysiphyllum carronii</i>	2.47	38.54	10.9	35.5	7741-6
EEM_OA_01	30		d - <i>Acacia harpophylla</i> ; a/s - <i>Terminalia oblongata</i> , <i>Lysiphyllum carronii</i>	1.30	21.66	28.9	74.8	7393-8
EEM_OA_05			d - <i>Acacia harpophylla</i> ; a/s - <i>Terminalia oblongata</i> , <i>Lysiphyllum carronii</i> ; s - <i>Eucalyptus coolabah</i>	1.90	26.06	2.2	14.4	7524-9

Photographs

EEM_OA_01



Plate 1 – centre of plot, looking north



Plate 2 – centre of plot, looking east



Plate 3 – centre of plot, looking south



Plate 4 – centre of plot, looking west



Plate 5 – centre of plot, groundcover



Plate 6 – centre of plot, soils

EEM_OA_02



Plate 7 – centre of plot, looking north



Plate 8 – centre of plot, looking east



Plate 9 – centre of plot, looking south



Plate 10 – centre of plot, looking west



Plate 11 – centre of plot, groundcover



Plate 12 – centre of plot, soils



Plate 13 – cracking (2m vehicle mounted flag)



Plate 14 – flag adjacent to crack indicating length

EEM_OA_05



Plate 15 – centre of plot, looking north



Plate 16 – centre of plot, looking east



Plate 17 – centre of plot, looking south



Plate 18 – centre of plot, looking west



Plate 19 – centre of plot, groundcover



Plate 20 – centre of plot, soils

EEM_OA_13



Plate 21 – centre of plot, looking north



Plate 22 – centre of plot, looking east



Plate 23 – centre of plot, looking south



Plate 24 – centre of plot, looking west



Plate 25 – centre of plot, groundcover



Plate 26 – centre of plot, soils



Plate 27 – native sedge cover and deep cracking within plot

APPENDIX A2: WILDNET ONLINE REPORT – WOLLOMBI STATION



Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -21.3642
Longitude: 147.8209
Distance: 10
Email: david.sasse@earthtrade.com.au
Date submitted: Wednesday 25 Nov 2015 11:10:29
Date extracted: Wednesday 25 Nov 2015 11:20:03

The number of records retrieved = 74

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufo	<i>Rhinella marina</i>	cane toad	Y			17
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		9
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		31
animals	amphibians	Hylidae	<i>Cyclorana cultripes</i>	grassland collared frog		C		1
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		1
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		3
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		7
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		4
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		11
animals	mammals	Dasyuridae	<i>Antechinus flavipes flavipes</i>	yellow-footed antechinus		C		1
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart		C		6
animals	mammals	Dasyuridae	<i>Planigale ingrami</i>	long-tailed planigale		C		4
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		2
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		1
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			4
animals	mammals	Muridae	<i>Pseudomys sp.</i>					1
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		1
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		3
animals	reptiles	Agamidae	<i>Diporiphora australis</i>			C		6
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		21
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python		C		3
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		4
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		1
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		2
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		5
animals	reptiles	Diplodactylidae	<i>Strophurus williamsi</i>	soft-spined gecko		C		5
animals	reptiles	Diplodactylidae	<i>Lucasium steindachneri</i>	Steindachner's gecko		C		10
animals	reptiles	Diplodactylidae	<i>Diplodactylus platyurus</i>	eastern fat-tailed gecko		C		5
animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake		C		20
animals	reptiles	Elapidae	<i>Furina ornata</i>	orange-naped snake		C		1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		1
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	20
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		2
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake		C		12
animals	reptiles	Elapidae	<i>Demansia vestigiata</i>	lesser black whipsnake		C		4
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		3
animals	reptiles	Elapidae	<i>Vermicella annulata</i>	bandy-bandy		C		1
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake		C		1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>			C		3
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		2
animals	reptiles	Pygopodidae	<i>Pygopus schraderi</i>	eastern hooded scaly-foot		C		5
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		1
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>			C		8
animals	reptiles	Scincidae	<i>Pygmaeascincus timlowi</i>	dwarf litter-skink		C		1
animals	reptiles	Scincidae	<i>Ctenotus allotropis</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Scincidae	<i>Tiliqua scincoides</i>	eastern blue-tongued lizard		C		1
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>			C		1
animals	reptiles	Scincidae	<i>Eremiascincus fasciolatus</i>	narrow-banded sand swimmer		C		1
animals	reptiles	Typhlopidae	<i>Anilius ligatus</i>	robust blind snake		C		1
animals	reptiles	Typhlopidae	<i>Anilius unguirostris</i>	claw-snouted blind snake		C		1
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		1
plants	higher dicots	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower		C		1/1
plants	higher dicots	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1/1
plants	higher dicots	Asteraceae	<i>Acanthospermum hispidum</i>	star burr	Y			1/1
plants	higher dicots	Asteraceae	<i>Senecio pinnatifolius</i> var. <i>pinnatifolius</i>			C		1/1
plants	higher dicots	Asteraceae	<i>Zinnia peruviana</i>	wild zinnia	Y			1/1
plants	higher dicots	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		1/1
plants	higher dicots	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		1/1
plants	higher dicots	Chenopodiaceae	<i>Dysphania carinata</i>			C		1/1
plants	higher dicots	Combretaceae	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		1/1
plants	higher dicots	Convolvulaceae	<i>Xenostegia tridentata</i>			C		1/1
plants	higher dicots	Fabaceae	<i>Tephrosia juncea</i>			C		1/1
plants	higher dicots	Goodeniaceae	<i>Goodenia hirsuta</i>			C		1/1
plants	higher dicots	Malvaceae	<i>Gossypium australe</i>			C		1/1
plants	higher dicots	Molluginaceae	<i>Glinus lotoides</i>	hairy carpet weed		C		1/1
plants	higher dicots	Myrtaceae	<i>Eucalyptus persistens</i>			C		1/1
plants	higher dicots	Plantaginaceae	<i>Scoparia dulcis</i>	scoparia	Y			1/1
plants	higher dicots	Rubiaceae	<i>Everistia vacciniifolia</i> forma <i>vacciniifolia</i>			C		1/1
plants	higher dicots	Sapindaceae	<i>Dodonaea triangularis</i>			C		1/1
plants	monocots	Poaceae	<i>Aristida calycina</i> var. <i>praealta</i>			C		1/1
plants	monocots	Poaceae	<i>Brachyachne convergens</i>	common native couch		C		1/1
plants	monocots	Poaceae	<i>Cenchrus setigerus</i>		Y			1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*. The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ().

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*. The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

APPENDIX B: PROTECTED MATTERS SEARCH TOOL REPORT – WOLLOMBI STATION



Australian Government
Department of the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/11/15 11:57:02

[Summary](#)

[Details](#)

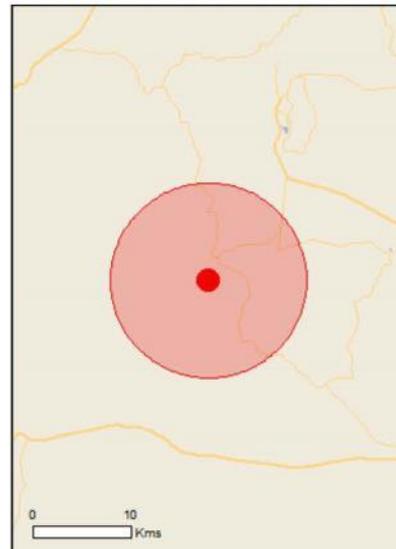
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 10.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	12
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine):	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Erythrorhynchus radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur

Name	Status	Type of Presence within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area
Lerista vittata Mount Cooper Striped Lerista [1308]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Frogs		
Rhinella marina		
Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris		
Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus		
Horse [5]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus		
House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa		
Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica		
Prickly Acacia [6196]		Species or species habitat may occur within area
Cryptostegia grandiflora		
Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis		
Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata		
Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
------	--------	---------------------------------

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-21.36428 147.82094

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Parks and Wildlife Commission NT, Northern Territory Government](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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APPENDIX C: CURRICULA VITAE OF SUITABLY QUALIFIED EXPERTS

Please refer to pdf file supplied separately.

LIST OF ABBREVIATIONS

Abbreviation	Description
AU	Assessment Unit
BOMP	Biodiversity Offset Management Plan
BOS	Biodiversity Offset Strategy
BVG	Broad Vegetation Group
DoE	Department of the Environment
DEHP	Department of Environment and Heritage Protection (Qld)
DNRM	Department of Natural Resources and Mines (Qld)
EA	Environmental Authority
EEM	Ecological Equivalence Methodology
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EOA	<i>Environmental Offsets Act 2014 (Qld)</i>
EOP	<i>EPBC Act Environmental Offsets Policy (2012)</i>
EPBC Act	<i>Environment Protection & Biodiversity Conservation Act 1999 (Cth)</i>
ha	Hectares
km	Kilometres
ML	Mining Lease
MNES	Matters of National Environmental Significance
MR Act	<i>Mineral Resources Act 1989 (Qld)</i>
MSES	Matters of State Environmental Significance
OAMP	Offset Area Management Plan
PMAV	Property Map of Assessable Vegetation
QBOP	<i>Queensland Biodiversity Offset Policy (2011)</i>
RE	Regional Ecosystem
SEIS	Supplementary Environmental Impact Statement
SSBV	State Significant Biodiversity Value
TEC	Threatened Ecological Community
VMA	<i>Vegetation Management Act 1999 (Qld)</i>