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Prepared for: Arrow CSG Australia Pty Ltd

SGP North Solar Farm

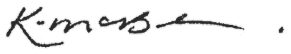
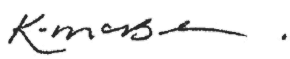
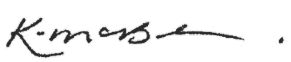
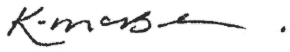
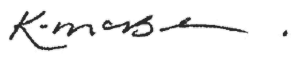
Offset Proposal

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Terms and Abbreviations

Term/Acronym	Definition
AHD	Australian Height Datum
AHT	Ancillary habitat trees
AI	Activity index
ALA	Atlas of Living Australia
APZ	Asset protection zone
AU	Assessment Unit
BESS	Battery Energy Storage System
BPA	Biodiversity Planning Assessment
CSG	Coal Seam Gas
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP Guide	Queensland Government's Guide to determining terrestrial habitat quality version 1.2
DoE	Department of the Environment
EIS	Environmental Impact Statement
EPBC Act	*Environment Protection and Biodiversity Act 1999*
EP Act	*Environmental Protection Act 1994*
FCS	Field Compression Station
GBO	General Biosecurity Obligation
HPF	Hybrid Power Facility
LGA	Local Government Area
LIKT	Locally important koala trees
LoO	Likelihood of Occurrence
MHQA	Modified Habitat Quality Assessment
MNES	Matters of National Environmental Significance
MWp	Megawatt peak
NEPA	National Environmental Protection Agency
OMP	Offset Management Plan
OP	Offset Proposal
PCS	Power conversion system
PD	Preliminary Documentation
RE	Regional Ecosystem
RFI	Request for Further Information
RVMM	Regulated Vegetation Management Map

Term/Acronym	Definition
SGP	Surat Gas Project
WoNS	Weeds of National Significance

1. Introduction

1.1 Background

Arrow CSG Australia Pty Ltd (Arrow CSG) is proposing to develop the Surat Gas Project (SGP) North Solar Farm (the Project) on land at Retreat Road, Kowguran approximately 18 km north of Miles. The Project will supply renewable electricity to a planned hybrid power facility (HPF) being developed to power the SGP North Field Compression Station (FCS) and is a key initiative in Arrow CSG's plans to reduce greenhouse gas emissions and meet net zero targets. The proposed HPF will comprise gas reciprocating engines (up to 24.5 MW), a battery energy storage system (BESS) (up to 8.78 MVA capacity) and associated infrastructure.

The Project will be located on Lot 17 AU199. The HPF will be located on the adjoining property to the south (Lot 16 AU38). The Project will be connected to the main power facility via an 11 kV transmission line which will be incorporated into corridors cleared for the gas gathering network for the majority of its length. Site access will be gained from Retreat Road via internal access roads to be developed by Arrow CSG across Lot 16 AU38.

The HPF and FCS are part of the broader SGP which has previously been assessed and approved under the following approvals which will also encompass the transmission line and solar farm access road:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) with approval (EPBC 2010/5344) granted on 19 December 2013; and
- Queensland *Environmental Protection Act 1994* (EP Act), with the Environmental Authority (EA001399) as amended on 28 January 2026.

The Project is being developed separately to Arrow CSG's coal seam gas network, and it is intended that it will be operated by a third-party provider. As such, the Project was referred separately to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (now known as the National Environmental Protection Agency [NEPA]) on 11 September 2024 for consideration of its impacts on Matters of National Environmental Significance (MNES) protected under the EPBC Act (EPBC 2024/10002).

On 17 February 2025, DCCEEW determined the Project to be a 'controlled action' requiring assessment and approval by Preliminary Documentation (PD) in accordance with Part 8, Division 4 of the EPBC Act. To assess the relevant impacts of the Project, a Request for Further Information (RFI) was received from DCCEEW on the 19 March 2025. As outlined in the RFI, where residual significant impacts to MNES remain after application of all reasonable avoidance and mitigation measures, a compensatory environmental offset in accordance with the EPBC Act is required.

1.2 Purpose

This Offset Proposal has been prepared to address the relevant requirements of Section 6 and Attachment B of the RFI. A summary of these requirements and where they are addressed in this document is provided in **Table 1.1**.

Table 1.1: Summary of RFI requirements relating to the Offset Proposal

RFI Section	Requirement	Relevant Section in the OP
Section 6	If an offset is required, prior to publication, the preliminary documentation must include an: 1. Offset Proposal – The Offset Proposal must provide detail about the proposed offset site or sites including baseline survey information (including threats such as weed cover and pest species surveys), habitat or vegetation quality scores, how the offset will be managed, and evidence that the protected matter is present or uses the offset site. The Offset	**The Offset Proposal has been prepared to address this requirement**

RFI Section	Requirement	Relevant Section in the OP
	Proposal must demonstrate how the proposed offset is suitable and meets the principles of the EPBC Offsets Policy and must include sufficient information for the department to assess it using the EPBC Offsets Assessment Guide.	
Section 7	Habitat Quality Assessments A methodology that is suitable for each listed threatened species or threatened ecological community (i.e., endorsed by the department or supported by literature) where there is a residual significant impact must be used to assess habitat quality, noting the same scoring mechanism must be used at both impact and offset sites. The department currently prefers habitat quality scoring methods for each prescribed matters to be consistent with the Modified Habitat Quality Assessment (MHQA) method. The MHQA tool derives habitat quality scores using an adaptation of the Queensland Government's Guide to determining terrestrial habitat quality version 1.2 (DEHP Guide). The MHQA aligns, as far as possible the DEHP Guide with the requirements of the EPBC Act Environmental Offsets Policy for determining habitat quality scores. In aligning with this policy, all habitat quality scoring methods are required to generate future scores for 'with' and without' offset scenarios. Forecast gains or loss in habitat quality score must be substantiated by scientific information and via the endorsed MHQA (or alternative) method.	**Section 4** **Appendix A**
Attachment B – Offset Proposal Requirements		
1.	Further to Section 6 of the PD request, the offset proposal must include, but not be limited to, the following:	
1.1	A detailed project description, including a site description and how and to what extent your action will impact on protected matters.	**Section 2**
1.2	Details of the protected matters being impacted by the proposed action, including the total number of individuals and/or extent of habitat being impacted.	**Section 2.4**
1.3a	A description of the proposed offset site(s) including location, size and relevant ecological/species habitat features, landscape context and cadastre boundaries of the offset site(s) (supported by mapping).	**Section 3.1** **Section 3.2** **Section 3.4** **Section 3.5**
1.3b	Information about how the proposed offset site/s area will provide connectivity with other relevant habitats and biodiversity corridors.	**Section 3.2**
1.3c	Information about how the proposed offset site/s contribute to relevant State and/or regional plan/s or initiatives for the conservation of the protected matter.	**Section 3.5**
1.3d	Evidence of the presence of, or usage by, relevant MNES on, or adjacent to the proposed offset site(s).	**Section 3.5**
1.3e	Evidence that the location of the offset site is suitable and provides a conservation benefit to the impacted protected matter. Note: The EPBC	**Section 3.5** **Section 3.8**

RFI Section	Requirement	Relevant Section in the OP
	Offset Policy states that in most cases, the offset site should be as close to the impact as possible.	
1.3f	Up to date surveys and baseline data confirming the current condition/quality of vegetation on site (including number of hollow bearing trees if relevant), the extent and presence of weeds, and the extent of threats.	**Section 3.3** **Section 3.4** **Section 3.5** **Section 3.6** **Section 3.7** Attached MHQA-spreadsheet for each MNES presenting the baseline habitat quality score calculations.
1.3g	Information about the ecosystems present, current usage of the site, its general condition and location in the landscape/region.	**Section 3.2** **Section 3.4** **Section 3.5**
1.3h	An assessment of how the offset and impact sites are like-for-like, i.e., the environmental values for the MNES at the offset are of the same type or equivalent to that affected by the proposed action.	**Section 5.1**
1.3i	The methodology, with justification and supporting evidence, used to inform the inputs of the Offsets Assessment Guide in relation to the offset site for each relevant MNES, including: • Total area of habitat (in ha) • Habitat quality • Time over which loss is averted (maximum 20 years) • Time until ecological benefit • Risk of loss (%) without offset • Risk of loss (%) with offset • Confidence in result (%)	**Section 4** **Section 5.1** Attached MHQA-spreadsheet for each MNES presenting the habitat quality score calculations and offsets assessment guide calculators.
1.4	The Offset proposal must demonstrate how the offset meets the principles of the EPBC Offsets Policy and EPBC Offsets Assessment Guide to inform the Minister's decision on whether or not the project should be approved under the EPBC Act.	**Section 5.1** **Section 5.2**
1.5	Details of the actual or estimated cost of the offset proposal including costs associated with proposing mitigation and management measures onsite.	**Section 6.1** **Section 6.2**
1.6	Details of the execution timing of the protective mechanism to legally secure the environmental offset/s (minimum covenant or otherwise accepted method) proposed to be applied at any offset site/s to providing	**Section 6.3**

RFI Section	Requirement	Relevant Section in the OP
	enduring protection (for at least the duration of the impact), including a draft of the protective mechanism and its terms. Note that protective mechanisms for permanent impacts should continue in perpetuity.	

1.3 Scope

The 302.9 ha offset area is strategically located within 4 km of the Development footprint, on the Girrahween Station property on Lot 31 and 32 AU60. The Girrahween Station property is owned by Arrow (Tipton Two) Pty Ltd (a subsidiary company of Arrow CSG), adjoins the south-west boundary of Barakula State Forest and is located within the Western Downs local government area (**Figure 1.1**).

This Offset Proposal has been prepared to demonstrate how the proposed land based offset area is suitable to acquit at least 100% of the Project's significant residual impacts on habitat for Corben's long eared bat (*Nyctophilus corbeni*), diamond firetail (*Stagonopleura guttata*), south-eastern glossy black-cockatoo (*Calyptorhynchus lathami lathami*), koala (*Phascolarctos cinereus*), Dunmall's snake (*Furina dunmalli*) and squatter pigeon (*Geophaps scripta scripta*) in accordance with the EPBC Act Environmental Offsets Policy and offsets assessment guide.

The scope of this Offset Proposal includes:

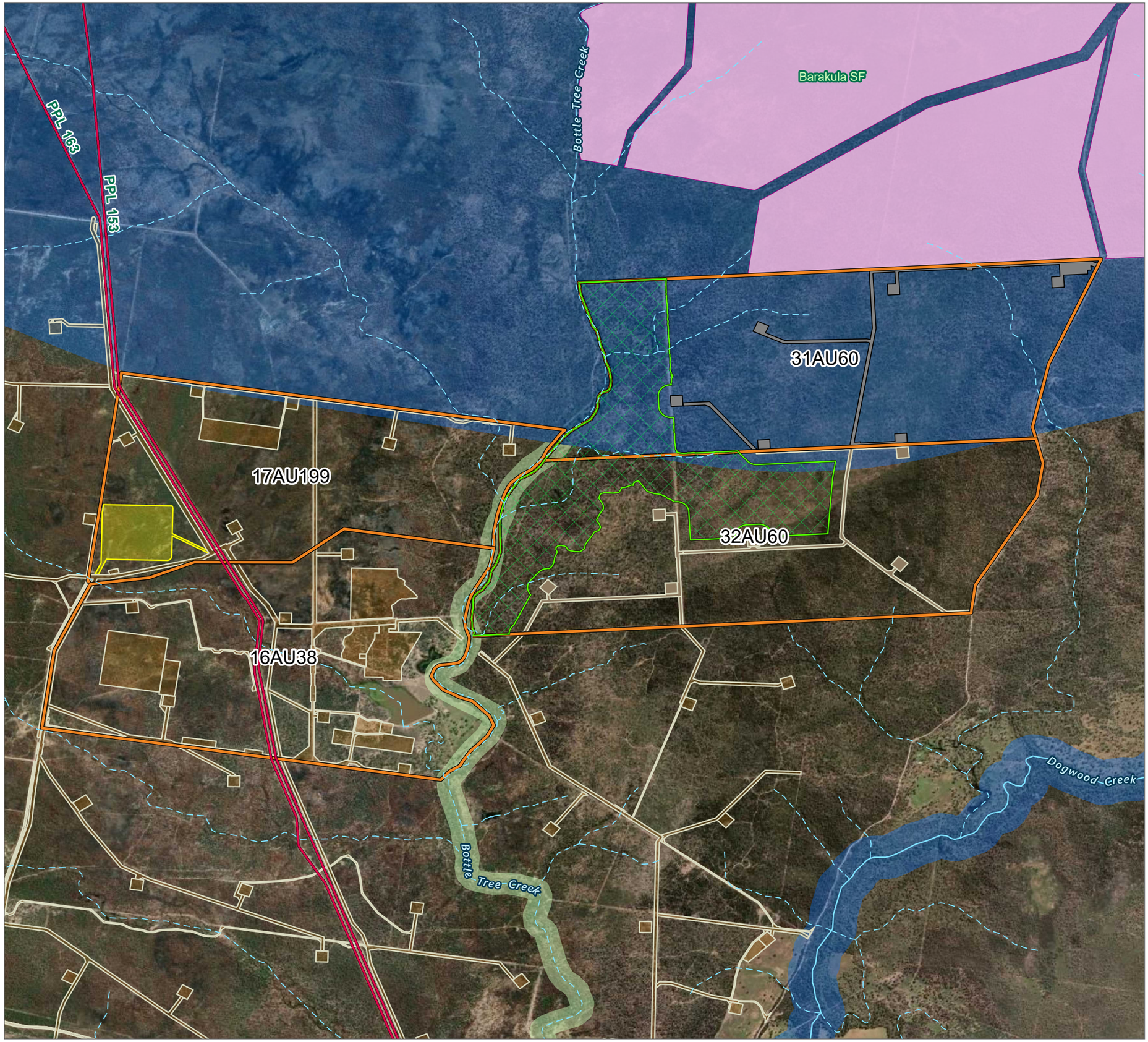
- A description of the Project including:
  - the ecological values identified within the Development footprint
  - the Project's significant residual impacts on MNES required to be offset
- A description of the offset area including:
  - an overview of offset area location
  - information related to the offset area's connectivity with other relevant habitats and biodiversity corridors
  - a summary of the field surveys conducted to date within the offset area
  - an overview of the vegetation communities identified within the offset area
  - a detailed description of habitat considered suitable to support the Project's MNES offset requirements, including an overview of how the offset area addresses the known threats to the species and contributes to the relevant species conservation initiatives
  - results of baseline surveys for weed and pest animals
- The habitat quality assessment method and scores used to inform the inputs into the offsets assessment guide for each MNES at the impact and offset areas
- Suitability of the offset area addressing:
  - the EPBC offsets assessment guide inputs and justifications for the Project's MNES offset requirements
  - how the offset meets the principles of the EPBC Offsets Policy and EPBC offsets assessment guide
  - an assessment of how the offset and impact sites are like-for-like
- Offset implementation and management including:
  - an overview of the proposed offset management plan (OMP)
  - a cost estimate to deliver the proposed offset
  - the proposed legal security mechanism and timing.

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Offset Proposal

Figure 1.1

Project and offset area location and connectivity



- Petroleum Pipeline Licence (PPL)
- Major Watercourse
- Minor Watercourse
- Girrahween Station
- Development Footprint (30.1 ha)
- Offset Area (302.9 ha)
- Approved Infrastructure Footprint
- Proposed Infrastructure Footprint

Biodiversity Corridor Buffers:

- State
- Regional

Protected areas and forests of Queensland:

- State Forest

DRAWN: JT
REVIEWED: MW

DATE: 21/05/2026
DWG No.: ARR-005_074[E]



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SCALE (A3): 1:35,000

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Data Source:© State of Queensland (Department of Resources) 2022, © State of Queensland (Department of Resources) 2024, © State of Queensland (Department of Resources), 2023, Not to be used as a definitive absolute location of reserve boundaries. This dataset is derived from the Digital Cadastre Database (DCDB). The accuracy of the spatial representation is determined by the accuracy of records in the version of the DCDB from which this dataset was derived., © State of Queensland (Department of Environment and Heritage Protection) 2017, Vantor, © OpenStreetMap contributors, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

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2. Project Description

2.1 Overview

The Project is located on the western side of Lot 17 AU199, approximately 2 km south-west of Barakula State Forest (**Figure 1.1**). The Project involves the construction, operation and decommissioning of a 17 megawatt peak (MWp) capacity solar farm, comprising:

- Approximately 30,000 individual solar panels on single axis tracker mounting systems;
- Four modular power conversion system (PCS) container units enclosing inverters, transformers and switchgear;
- Approximately 355 m of the 11 kilovolt (kV) transmission connection (either underground or overhead cabling to be determined during detailed design);
- Underground cabling connecting solar arrays ('strings') to inverter stations;
- Two meteorological stations for recording meteorological data to track performance and monitor site conditions;
- Two construction laydown areas, a construction carpark and water storage tank;
- Internal boundary fire trail and asset protection zone (APZ);
- Perimeter access track including connection to the internal access road network being developed on Girrahween Station as part of the broader SGP North gasfield development (approximately 1.7 km total track length); and
- Perimeter fencing comprising an approximately 1.8 m tall fauna exclusion floppy top chain link fence based on best-practice fencing guidelines including the Queensland Department of Transport and Main Roads (DTMR 2025) Fauna Exclusion Fencing Standards. No barbed wire will be used in the fence.

The 'Development footprint', defined as the area directly impacted for the development of project infrastructure, is approximately 30.1 ha.

2.2 Project Development footprint description

The Development footprint contains non-remnant native vegetation which has been subject to a history of clearing and disturbance dating back to at least 1952 (QI 2026). The Development footprint comprises patches of cleared land interspersed with mixed eucalypt regrowth, buloke (*Allocasuarina luehmannii*) and *Callitris* stands (RE 11.5.1). Parts of the Development footprint were significantly damaged by bushfires in 2022-2023 with vegetation still affected at the time of the most recent surveys in June 2025. (**Plate 1**, **Plate 2** and **Plate 3**).

The Development footprint is currently grazed and is subject to an existing agistment agreement. Surrounding land uses are predominantly rural, rural residential and industrial. Two petroleum pipelines (PPL153 and PPL163) with a combined easement width of approximately 100 m run along the eastern boundary of the Development footprint, separating it from adjoining remnant vegetation to the east (**Figure 1.1**).

The Development footprint sits within a large tract of mostly contiguous remnant and regrowth vegetation that connects Miles to Barakula State Forest (**Figure 1.1**). Girrahween Station forms a portion of an east-west statewide biodiversity corridor that connects Gurulmundi State Forest with Barakula State Forest, in addition to a regional biodiversity corridor along Bottle Tree Creek that runs in a north-south direction in the east of Lot 17 AU199 (**Figure 1.1**).

The Development footprint falls within the Condamine-Balonne River catchment area. There are no watercourses within the Development footprint itself, with surface runoff conveyed via Bottle Tree Creek and Dogwood Creek, discharging into the Balonne River at its junction with the Condamine approximately 120 km downstream.

Plate 1: Regrowth *Callitris glaucophylla* (RE 11.5.1) post-fire in July 2025



Plate 2: Regrowth *Callitris glaucophylla* (RE 11.5.1) with fire damage in August 2023



Plate 3: Cleared areas with *Callitris glaucophylla* (not impacted by fire) in August 2023



2.3 Ecological values

The ecological values of the Development footprint were initially identified through a combination of desktop and field-based assessments undertaken as part of the Environmental Impact Statement (EIS) and Supplementary EIS process for the broader SGP between 2009 and 2013, and extensive follow up surveys conducted by EcoSmart in 2016 and 2017 (EcoSmart 2017). To inform development of the PD and identify the Project's potential significant residual impacts, the presence of MNES in the Development footprint has been reviewed and updated based on a combination of desktop and recent (post-2020) field-based assessments (**Table 2.1**). As detailed in Section 4 of the PD the steps undertaken to assess the presence of MNES included:

- Review of methods and results from previous ecological assessments and habitat mapping for the Project.
- Desktop review of available literature and database searches for previously recorded, mapped or potentially occurring MNES. Database searches were performed using a 10 km search radius. All MNES predicted to have potential habitat were included in the list for further assessment and consideration. A 50 km search radius was also reviewed for any highly mobile fauna species. Data sources reviewed as part of the desktop assessment included DCCEEW's Protected Matters Search Tool; DCCEEW's Species Profiles and Threats Database; Department of the Environment, Tourism, Science and Innovation WildNet database; eBird records of threatened and/or migratory birds; Atlas of Living Australia database and distribution mapping; and available Queensland Government mapping layers.
- An initial (pre-field work) Likelihood of Occurrence (LoO) assessment for the MNES identified through desktop searches to inform preliminary field surveys.
- Preliminary ground-truthing surveys to document the condition and extent of vegetation communities, habitat types and other ecological values in the Development footprint.
- Analysis of field-based data in conjunction with aerial imagery to determine the extent of vegetation communities, habitat types, and associated MNES within and adjoining the Development footprint.
- Targeted ecological field surveys (**Table 2.1**) to identify:
  - threatened flora and threatened and migratory fauna species identified as potentially occurring within the Development footprint.
  - habitat resources for threatened flora and threatened and migratory fauna identified as potentially occurring within the Development footprint.
- Updating the LoO following the field surveys to re-assess the likelihood of MNES occurring within the Development footprint based on the results of the post-2020 field surveys (specifically the habitat assessments).
- Development of a suite of mitigation measures to minimise impacts to the identified likely and possible MNES.
- Undertaking significant impact assessments in accordance with the *Significant Impact Guidelines 1.1: Matters of National Environmental Significance* (DoE 2013) and supplemented with species-specific referral guidelines (where relevant) to confirm the likelihood of significant impacts to relevant MNES (see **Section 2.4**).

The following sections provide a brief description of the ecological values identified within the Development footprint, summarised from the detailed assessment provided as part of the main PD. The results of the Development footprint field-based assessments (**Table 2.1**) have been used to inform calculation of the habitat quality scores for the Project's significant residual impacts and assessment under the EPBC Act offsets assessment guide which is further detailed in **Section 4**.

Table 2.1: Summary of ecological survey programs undertaken across the Development footprint and broader study area within Lot 17 AU199

Survey	Details	Timing
BioCondition / Modified Habitat Quality Assessment	Development footprint BioCondition assessments to assess site-based attributes in accordance with the MHQA method (see **Appendix A**)	July 2025

Survey	Details	Timing
Targeted MNES Fauna Survey	Detailed fauna assessments primarily informed by the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Eyre et al. 2022), the Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus* (Phillips and Callaghan 2011) and species-specific survey guidelines available for targeted MNES fauna including: • diurnal bird surveys • active diurnal searches • spotlighting surveys • harp trapping surveys • koala Spot Assessment Technique surveys	June 2025
Targeted MNES Flora Surveys	Walkover surveys (systematic) within suitable habitat to detect threatened MNES flora	October 2023
Vegetation community survey	Ground-truthing of vegetation communities and habitat assessments in accordance with the Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland V7.0 (Neldner et al. 2023)	August 2023
Supplementary ecological field surveys	Vegetation surveys and habitat assessments	2021-2024

2.3.1 Terrestrial flora

The Development footprint has been subject to historical clearing and is shown as 'Category X' (non-remnant) on the Queensland Department of Resources' Regulated Vegetation Management Map (RVMM). This mapping was verified in the field to confirm the type, extent and boundaries of remnant and regrowth vegetation in the Development footprint. Most of the Development footprint was found to be either cleared or regrowth eucalypt woodland on Cainozoic sand plains, corresponding to RE 11.5.1. Ground-truthed RE descriptions for vegetation communities within the Development footprint are set out in **Table 2.2** and illustrated on **Figure 2.1.**

A total of 86 flora species were identified within the surveyed Development footprint, comprising 84 native species and 2 exotic species with no threatened flora species protected under the EPBC Act identified.

Weed species, particularly those listed as Weeds of National Significance (WoNS), restricted invasive plants under the *Biosecurity Act 2014* (Qld) and restricted pest weeds listed by the Western Downs Regional Council, were opportunistically recorded throughout the Development footprint. Only two species of weeds were observed in two singular observations within the Development footprint, red natal grass (*Melinis repens*) and an *Opuntia sp* within the ground cover of the regrowth RE 11.5.1 and non-remnant areas.

Table 2.2: Summary of the ground-truthed RE within the Development footprint

Regional Ecosystem	Condition Status	Description	VMA Status	Area (ha)
11.5.1	Regrowth	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	Least concern	19.8
Non-remnant*		-	-	10.3
Total				30.1 ha

*Areas of non-remnant vegetation within the Development footprint are considered to correspond with pre-clearing RE 11.5.1 based on in-field records of adjacent vegetation communities, isolated trees and vegetation within the non-remnant patch as well as surrounding landform, soils and geology. Since these non-remnant areas have been considered as part of the Project's significant residual impact on Corben's long-eared bat, diamond firetail, and koala (see **Section 2.4**), pre-clearing RE 11.5.1 has been used as a reference benchmark to calculate the associated impact habitat quality scores for this area (see **Section 4**).

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Figure 2.1

Development footprint ground-truthed Regional Ecosystem Mapping



- Impact Biocondition Sites
- Minor Watercourse
- Girrahween Station
- Development Footprint (30.1 ha)

Ground-truthed Regional Ecosystem Mapping:

- 11.5.1
- 11.7.4
- 11.7.5
- Regrowth (11.5.1)
- Regrowth (11.7.4)
- Non-remnant

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2.3.2 Terrestrial fauna

Habitat identified within the Development footprint is predominantly regrowth eucalypt woodlands to open woodlands dominated by narrow-leaved ironbark (*Eucalyptus crebra*) with stands of buloke (*Allocasuarina luehmannii*) and white cypress pine (*Callitris glaucophylla*) with a grassy understorey (corresponding to regrowth RE 11.5.1). Associated microhabitat features include fallen timber, decorticating bark, and very sparse mistletoe. There are no trees large enough to support notable hollows with an average tree diameter at breast height (DBH) of less than 30 cm recorded across the Development footprint.

Large parts of this habitat type have been affected to varying degrees by wildfire in December 2022 resulting in a simplified habitat structure at the time of the field assessments in August 2023 and July 2025 (**Plate 4** and **Plate 5**).

While the Development footprint adjoins the Barakula to St George State biodiversity corridor to the north (**Figure 1.1**), regrowth vegetation within the Development footprint is considered fragmented due to clearing associated with the existing pipeline easement to the east of the Development footprint (PPL153 and PPL163) and boundary access tracks as well as historical clearing activities across the property.

A total of 50 fauna species were recorded within the Development footprint, comprising 34 bird species, 10 mammal species and one reptile species; however, no threatened fauna species protected under the EPBC Act were identified.

Introduced species observed during field surveys include feral cat (*Felis catus*) and European hare (*Lepus europaeus*), with a further 15 records of introduced species encountered as part of desktop searches of the Development footprint and surrounds (50km).

Plate 4 Regrowth woodland habitat characteristic of the Development footprint



Plate 5 Non-remnant *Callitris* dominated vegetation within the Development footprint



2.4 Significant residual impacts

Ecological studies conducted across the Development footprint have confirmed the presence of suitable habitat for several MNES species. Significant impact assessments undertaken as part of the PD and in accordance with EPBC Significant Impact Guidelines v1.1 (DoE 2013), identified that the Project would likely have a significant impact on, and require offsets for, five MNES species. A summary of these species, their EPBC status and the quantity of impacted habitat is provided in **Table 2.3**.

A description of the habitat identified within the Development footprint for each MNES is presented below. These habitat descriptions have been used to inform impact habitat quality assessments for each MNES (**Section 4**).

Table 2.3: Significantly impacted MNES species

Common Name	EPBC Status*	Habitat type	Habitat within the Development footprint (ha)	Total significant residual impact (ha)
Corben's long eared bat	V	Roosting and foraging	19.8	30.1
		Foraging only	10.3	
Diamond Firetail	V	Breeding and foraging	30.1	30.1
South-eastern glossy black-cockatoo	V	Foraging	19.8	19.8
Koala	E	Breeding and foraging	19.8	30.1
		Dispersal	10.3	
Dunmall's snake	V	Breeding and foraging	19.8	19.8
Squatter pigeon	V	Foraging	30.1	30.1

*Vulnerable (V); Endangered (E)

2.4.1 Corben's long eared bat

The Project will require the removal of approximately 30.1 ha of foraging habitat (which includes approximately 19.8 ha of suitable roosting habitat) for Corben's long-eared bat.

The conservation advice for Corben's long-eared bat does not provide a definition for habitat critical to the survival of the species, as such a broad definition of habitat was considered as an area that is necessary:

- for activities such as foraging, roosting, breeding or dispersal,
- for the long-term maintenance of the species,
- to maintain genetic diversity and long-term evolutionary development, and
- for the reintroduction of populations or recovery of the species.

Foraging habitat for Corben's long-eared bat appears to be concentrated around patches of trees in the landscape which are likely used as roosting locations (under exfoliating bark or in tree hollows). Since the species is not known to venture far from these patches of vegetation, a 100 m buffer was applied to all mapped vegetation communities that are dominated by a tree layer (RE 11.5.1). This assessment concluded that the entire Development footprint likely provides suitable foraging habitat for this species, whereas suitable roosting is limited to areas of regrowth RE 11.5.1.

Several records of the Corben's long-eared bat have been identified in the region surrounding the Development footprint (including Barakula State Forest and Condamine State Forest), suggesting that a local population is likely to occur. The nearest record is approximately 2 km to the south-east (Arrow CSG 2013; **Figure 3.3**).

2.4.2 Diamond firetail

The Project will require the removal of approximately 30.1 ha of suitable breeding and foraging habitat for diamond firetail.

Habitat critical to the survival of the diamond firetail has been defined in the conservation advice (DCCEEW 2023a) and includes areas of:

- *Eucalypt*, *Acacia* or *Casuarina* woodlands, open forests and other lightly timbered habitats.
- Low tree density, few large logs and little litter cover but high grass cover for foraging, roosting and breeding.
- Drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges.

Considering the broad range of woodland vegetation types that this species can utilise, the entire Development footprint is suitable breeding and foraging habitat for this species.

Several diamond firetail records have been recorded in the region surrounding the Development footprint (including Gurulmundi State Forest, Barakula State Forest and Condamine State Forest), suggesting that a local population may occur; however, no individuals were observed during consolidated survey efforts across the Development footprint. The nearest record is approximately 23 km to the north-west from 2019 (ALA 2025; **Figure 3.3**).

2.4.3 South-eastern glossy black-cockatoo

The Project will require the removal of approximately 19.8 ha of suitable foraging habitat for south-eastern glossy black-cockatoo.

Specific areas of habitat critical to the survival of the south-eastern glossy black-cockatoo have not been identified within the conservation advice (DCCEEW 2022). However, the conservation advice identifies the following as features of habitat critical for survival for the south-eastern glossy black-cockatoo:

- South-eastern glossy black-cockatoos rely on nine species of sheoaks for foraging, with species use varying depending on the region. In southeast Queensland and northeast New South Wales they have shown preference for black sheoak (*A. littoralis*) and forest sheoak (*A. torulosa*), although there are also records of them feeding on stringbark sheoak (*A. inophloia*), coastal sheoak (*C. equisetifolia*), and to a lesser extent river sheoak (*C. cunninghamiana*) and swamp sheoak (*C. glauca*) during limited times of the year.
- The majority of the nesting hollows were in narrow-leaved ironbark (*Eucalyptus crebra*) but other species included blue-leaved ironbark (*E. nubile*) and Blakely's red gum (*E. blakelyi*). All potential nesting hollows were in large hollow bearing trees. Suitable nesting locations are typically within 1 km of their primary feed tree species, and 200 m from permanent water.

The conservation advice notes that both recent survey data and historical records need to be considered when assessing the relative importance of a region for the species; as their seasonal movements are poorly understood, areas that constitute habitat critical to the survival might not have birds in any one year. The lack of mature vegetation and permanent water resources within the Development footprint suggests that it is unlikely to contain any suitable roosting habitat for this species. No large hollows (equal to or larger than 10 cm) were observed during surveys across the Project. As such, the Project has been mapped as containing foraging habitat only.

Habitat assessments and vegetation mapping undertaken across the Development footprint identified an abundance of buloke (*Allocasuarina luehmannii*) within regrowth RE 11.5.1 communities. Whilst *A. luehmannii* is not listed as a preferred feed tree for this species (DCCEEW 2022), studies undertaken in south-east Queensland, west of the Great Dividing Range, have observed this species feeding in remnant belah (*Casuarina cristata*) and *A. luehmannii* forests (Hourigan 2012). As such, the Development footprint has been mapped as foraging habitat for this species.

Numerous south-eastern glossy black-cockatoos have been recorded in the region surrounding the Development footprint (including Barakula State Forest and Condamine State Forest), suggesting that a local population may occur, however no individuals have been observed during consolidated survey efforts within the Development footprint. The nearest record is approximately 2 km to the south-east (Arrow CSG 2013; **Figure 3.3**).

2.4.4 Koala

The Project will require the removal of approximately 19.8 ha of breeding and foraging and 10.3 ha of dispersal habitat for koala, totalling 30.1 ha of cleared habitat.

Vegetation within the Development footprint is characterised by regrowth RE 11.5.1 that has been heavily impacted by historical clearing and recent fire. However, this vegetation does contain locally important koala trees (LIKT) and ancillary habitat trees (AHT) as defined by Youngentob et al (2021) including:

- *Eucalyptus crebra;*
- *E. populnea;*
- *E. exserta;* and
- *E. fibrosa*.

Areas of regrowth RE 11.5.1 are considered likely to provide suitable breeding and foraging opportunities for koala, though this species would be expected to be present only in low densities.

Whilst no evidence of koalas have been observed within the Development footprint, there are numerous records in the region surrounding the Development footprint, the nearest of which being 9 km to the south-east from 1987 (ALA 2025) with a more contemporary record occurring 26 km to the north-east from 2017 (ALA 2025; **Figure 3.3**). These records along with an abundance of suitable habitat for this species, suggests that a local koala population may utilise habitat values present within the Development footprint.

2.4.5 Dunmall's snake

The Project will require the removal of approximately 19.8 ha of potential breeding and foraging habitat for Dunmall's snake.

This species has been recorded in a broad range of habitats, including forests and woodlands on black alluvial cracking clays and clay loams dominated by Brigalow, other wattles or buloke; and various blue spotted gum, ironbark, white cypress and buloke open forests and woodlands associations on sandstone derived soils (DCCEEW 2023b). Whilst they can occur in a wide range of habitats, they appear to show preference for brigalow habitats growing on cracking black clay and clay loams.

Patches of regrowth RE 11.5.1 mapped within the Development footprint represent suitable habitat for this species. Field surveys confirmed the presence of suitable microhabitat features such as small-medium sized coarse woody debris, soil cracks and termite mounds.

Whilst the Project is not located within an area that this species is 'Known/Likely to occur' in accordance with the draft referral guidelines (DCCEEW 2023b), it is situated in the middle of this species known distribution within Queensland. The Development footprint is situated within a large patch of contiguous vegetation that includes Barakula State Forest (which is itself 283,000 ha in size) that constitutes both important habitat and an important population for the Dunmall's snake.

No records of this species have been recorded within the Development footprint; however, sporadic records have been identified in the region surrounding the Development footprint, the nearest of which is approximately 7 km to the north-west (Arrow CSG 2022). There are also records from around Miles to south of the Condamine River to the west near Yuleba State Forest. Dunmall's snake is very rarely encountered, even in areas of known habitat and has been described as '*extremely secretive, rarely encountered, possibly genuinely scarce*' (Wilson 2022). The proximity of recent local records and the abundance of suitable microhabitat for this species indicate that, it is still considered possible that the Project will have a significant impact on the Dunmall's snake.

2.4.6 Squatter pigeon

The Project will require the removal of approximately 30.1 ha of potential foraging habitat for squatter pigeon including regrowth RE 11.5.1 and areas of non-remnant vegetation.

Like other granivorous birds inhabiting arid to semi-arid environments, squatter pigeons must drink regularly, possibly daily, and are described as being found nearly always near permanent water (Lloyd et al 2025). Previous advice suggested that foraging habitat was likely located within 3 km of permanent water and breeding habitat was located within 1 km (DoE 2025b), however a recent analysis of records suggests this is more likely to be within 1.7 km and within 500 m of permanent water respectively (Lloyd et al 2025). Squatter pigeon nests consist of a shallow depression scraped into the ground and sparsely lined with grass, typically underneath grasses, shrubs or other microhabitat features (DoE 2026b).

The entire Development footprint is likely to contain suitable foraging habitat for this species, as it is located within 1.7 km from a farm dam situated to the north-west of the Project, providing a permanent water source for the species. Given that breeding habitat is believed to only occur within 500 m of permanent water (Lloyd *et al* 2025), the Development footprint avoids any breeding habitat.

Several squatter pigeon records have been identified in the region surrounding the Development footprint (including Binkey State Forest, Cherwondah State Forest and Barakula State Forest), suggesting that a local population may occur or periodically utilise available habitat within the Development footprint, however no individuals have been observed during consolidated survey efforts. The nearest record is approximately 10 km to the west (Arrow 2019).

3. Offset Area Description

3.1 Overview

The 302.9 ha offset area is located within the two eastern lots of the Girrahween Station property (Lots 31 and 32 AU60; see **Figure 1.1**) approximately 4 km to the east of the Project. The Girrahween Station property is located within the Barakula subregion of the Brigalow Belt Bioregion, within the Western Downs Regional Council area. This freehold property is owned and operated by Arrow (Tipton Two) Pty Ltd (a subsidiary company of Arrow CSG) and was originally purchased in 2012 for the purpose of expanding their Coal Seam Gas (CSG) development footprint as part of the SGP North gasfield development under PLs 492, 491 and 305. The approved SGP North development footprint across the Girrahween Station property is presented on **Figure 1.1**.

The offset area has been located to avoid impacts associated with future gas infrastructure (refer to **Figure 1.1**). While the design and footprint of any future project infrastructure within Lots 31 and 32 AU60 are subject to change, Arrow CSG is committed to securing the proposed offset area and will ensure no future infrastructure is located within the offset area boundary. Lots 31 and 32 AU60 are also partially encumbered by an exploration permit for coal (EPC 1041) held by March Thirteen Investments Pty Ltd (expiry 12 June 2026); however, this is not considered to restrict legal security of the offset area on title.

In addition to the use of Lots 31 and 32 AU60 for future CSG development purposes, the property is subject to an existing agistment agreement with livestock currently grazed within the proposed offset area. Surrounding land uses are predominantly grazing, native vegetation, CSG development and forestry (Barakula State Forest), with a small number of residences associated with larger rural and agricultural properties in the surrounding area.

3.2 Connectivity

The northern portion of the offset area sits within the Barakula to St George State significant biodiversity corridor, mapped as part of the Queensland Government Biodiversity Planning Assessment (BPA) (**Figure 1.1**). Both State and regional corridors have been identified as significant areas of connectivity across bioregions to guide land-use planning and conservation efforts as part of a broader plan to ensure the resilience of Queensland's ecosystems.

The offset area forms part of a larger patch of remnant and regrowth vegetation connecting the offset area with Barakula State Forest to the north, providing additional areas of protected, contiguous habitat and wildlife refuge (**Figure 1.1**; **Figure 3.5**).

The offset area has been strategically located within the Girrahween Station property, on Lots 31and 32 AU60, to encompass Bottle Tree Creek and its adjacent vegetation communities supporting suitable habitat for the MNES offset values. Bottle Tree Creek is part of a regional riparian corridor that connects the Barakula to St George State significant biodiversity corridor to Dogwood Creek in the south (also mapped as a State biodiversity corridor) which eventually discharges into the Balonne River at its junction with the Condamine approximately 120 km downstream (**Figure 1.1**).

3.3 Baseline surveys

A combination of desktop assessments and detailed field assessments were undertaken across a broader survey area of approximately 1,254 ha comprising Lots 31 and 32 AU60 to identify and confirm an area suitable to support the Project's MNES offset requirements and inform preparation of the OMP.

Field surveys were undertaken by Attexo and Arrow ecologists over three separate deployments from 2-6 and 15-24 of September 2025 and 17-19 August 2026. The baseline survey effort and subsequent analysis completed to date across Lots 31 and 32 AU60 includes:

- Ground-truthing and verification of RE mapping including quaternary assessments in accordance with *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0* (Neldner et al. 2023).
- BioCondition and habitat quality assessments in accordance with the project specific MHQA method developed (see **Section 4** and **Appendix A**).
- Identification and assessment of suitable habitat for MNES fauna species, informed by incidental observations and targeted searches within the offset area, as well as targeted surveys undertaken across the Project's broader survey area and Development footprint, Arrow CSG's ecology data and species records collected from the surrounding region to support the development of the broader SGP.
- Weed cover surveys and photo-monitoring.
- Deployment of remote sensing camera traps to assess pest animal activity across the offset area.

3.4 Vegetation communities

The 302.9 ha offset area comprises a total of nine unique REs and has been strategically located to include a combination of remnant, regrowth and non-remnant areas, as summarised in **Table 3.1** and presented on **Figure 3.1**. The offset area is composed of remnant (205.5 ha; 68%) and regrowth (84.8 ha; 28%) vegetation dominated by a mixture of *Eucalypt* and *Corymbia* communities as well as areas of non-remnant (2 ha; 1%) vegetation and 10.7 ha of existing constructed tracks (4%). The offset area was significantly impacted by a recent bushfire in 2022-2023, which affected a large portion of the surrounding landscape, as shown in **Figure 3.2**.

Table 3.1: Regional ecosystems and assessment units within the offset area

Regional Ecosystem	Condition Status	Assessment Unit	Short Description	Area (ha)
11.3.4	Remnant	AU01	*Eucalyptus tereticornis* and/or Eucalyptus spp. woodland on alluvial plains	20.9
11.3.14	Remnant	AU02	Eucalyptus spp., Angophora spp., Callitris spp. woodland on alluvial plains	5.8
11.3.27f	Remnant	AU03	*Eucalyptus coolabah* and/or *E. tereticornis* open woodland to woodland fringing swamps	3.9
11.3.25	Remnant	AU04	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines	8.1
11.5.1	Remnant	AU05	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	68.2
	Regrowth	AU06		78.7
11.5.4	Regrowth	AU07	*Eucalyptus chloroclada*, *Callitris glaucophylla*, *C. endlicheri*, *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	6.1

Regional Ecosystem	Condition Status	Assessment Unit	Short Description	Area (ha)
11.5.20	Remnant	AU08	*Eucalyptus moluccana* and/or *E. microcarpa* and/or *E. woollsiana* +/- *E. crebra* woodland on Cainozoic sand plains	5.1
11.5.21	Remnant	AU09	*Corymbia bloxsomei* +/- *Callitris glaucophylla* +/- *Eucalyptus crebra* +/- *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	20.5
	Non-Remnant*	AU10		2.0
11.7.7	Remnant	AU12	*Eucalyptus fibrosa subsp. nubilis* +/- Corymbia spp. +/- Eucalyptus spp. woodland on Cainozoic lateritic duricrust	73.0
Constructed Access Tracks[#]		-	Cleared areas along existing access tracks.	10.7
Total				**302.9**

* Areas of non-remnant vegetation within the offset area are considered to correspond with pre-clearing RE 11.5.21 based on in-field records of adjacent vegetation communities, isolated trees, and vegetation within the non-remnant patch as well as surrounding landform, soils and geology. At the time of the field surveys this area was considered highly desiccated, potentially due to dry conditions and prior disturbance, and was not considered representative of the structure and diversity of RE 11.5.21. However, this patch of non-remnant vegetation is still considered to support suitable future habitat for Corben's long-eared bat, diamond firetail, and koala (see **Section 3.5**). The pre-clearing RE 11.5.21 code has been used as a reference benchmark to calculate the associated offset habitat quality scores for this area (see **Section 4**).
# Whilst these areas have been incorporated into the overall offset area, they have not been used in calculations for MNES habitat.

Remnant vegetation communities across the offset area are represented by RE 11.3.4, 11.3.14, 11.3.27f, 11.3.25, 11.5.1, 11.5.4, 11.5.20, 11.5.21 and 11.7.7. Silty-clays were evident in riparian communities (including RE 11.3.27f and RE 11.3.4) along Bottle Tree creek, with sandy or silty-loams present within communities on land zones 5 and 7. Damage to mature trees was still apparent from recent bushfires based on the presence of charred trunks; however, canopy cover and height are still considered to meet the requirements of a remnant ecosystem. The most significant impacts were evident the shrub layer of these remnant communities, with a low shrub cover observed across the majority of the offset area (**Plate 6 and Plate 7**). Based on the current condition of the remnant vegetation communities, active management is required to specifically improve the canopy cover, shrub cover and number of large tree and enhance the overall structure, composition, and diversity of the vegetation community compared to the reference benchmark.

Plate 6: Patch of remnant RE 11.7.7



Plate 7: Patch of remnant RE 11.3.4



The offset area contains two large patches of regrowth vegetation. Regrowth RE 11.5.4 (6.1 ha) is located in proximity to Bottle Tree Creek (**Plate 8**) and is surrounded by remnant vegetation communities. Regrowth RE 11.5.1 (78.7 ha) comprises the south-eastern portion of the offset area (**Plate 9**). These vegetation communities were heavily impacted by the recent bushfires, as evident in the shrub and ground layers which recorded low percentage cover across these attributes.

Active restoration, management and infill planting is required within these regrowth areas to improve cover across all strata, increase species diversity, increase the number of large trees, and improve habitat connectivity across the offset area.

Plate 8: Patch of regrowth RE 11.5.4

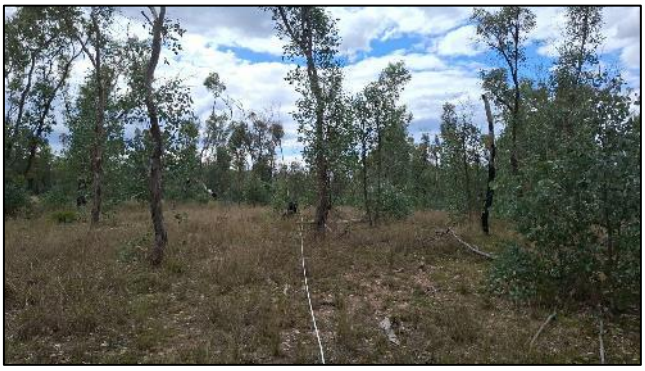


Plate 9: Patch of regrowth RE 11.5.1



The offset area also contains a single patch (2.0 ha) of predominantly cleared vegetation. This area is mapped as non-remnant analogous with RE 11.5.21 based on in-field records of adjacent vegetation communities, isolated trees, and vegetation within the non-remnant patch as well as surrounding landform, soils and geology. At the time of the field surveys this area was considered highly desiccated, potentially due to dry conditions and prior disturbance, and was not considered representative of the structure and diversity of RE 11.5.21. This patch is located on the south-western corner of the offset area along Bottle Tree Creek (**Plate 10** and **Plate 11**) and is surrounded by remnant vegetation. A review of aerial imagery (QI 2026) indicates that this area was cleared prior to 1952, likely to facilitate pastoral activities, and has not naturally regenerated. Isolated mature large trees are present, however there is a distinct lack of a noticeable shrub or recruiting layers. The ground layer is dominated by a mixture of native grasses and pasture grasses and comprised of sandy or silty-loams.

Broad-scale revegetation within the non-remnant area is required to re-create suitable habitat for the MNES offset values and improve the overall connectivity with the surrounding vegetation.

Plate 10: Patch of non-remnant RE 11.5.21 looking south



Plate 11: Patch of non-remnant 11.5.21 looking north



SGP NORTH SOLAR FARM

Offset Proposal

Figure 3.1

Ground-truthed Regional Ecosystem mapping across the offset area

Barakula SF

31AU60

32AU60

17AU199

16AU38

11.5.21
11.7.7
11.3.4
11.3.25
11.5.1
11.7.7
11.5.1
11.5.21
11.3.27f
Regrowth (11.5.4)
11.3.14
11.5.1
11.7.7
11.5.20
11.3.27f
11.7.7
Regrowth (11.5.1)
11.3.25
11.5.21
11.5.1
11.5.21
11.5.1
Non-Remnant (11.5.21)
Bottle Tree Creek

- Minor Watercourse
- Girrahween Station
- Offset Area (302.9 ha)

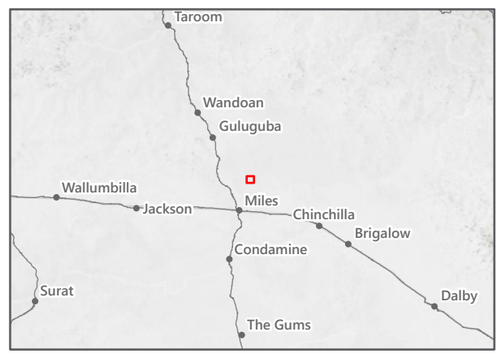
Protected areas and forests of Queensland:

- State Forest

Ground-truthed Regional Ecosystem within Offset Area:

- 11.3.4
- 11.3.14
- 11.3.25
- 11.3.27f
- 11.5.1
- 11.5.20
- 11.5.21
- 11.7.7
- Regrowth (11.5.1)
- Regrowth (11.5.4)
- Cleared
- Non-Remnant (11.5.21)

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SGP NORTH SOLAR FARM

Offset Proposal

Figure 3.2

Fire Scar mapping (from 2023) across Girrahween Station

Girrahween Station

Offset Area (302.9 ha)

Development Footprint (30.1 ha)

2023 Fire Scar Mapping:

February

March

31AU60

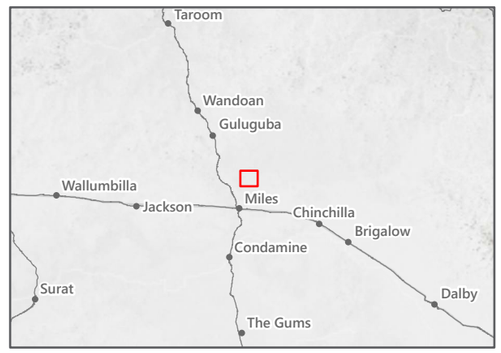
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32AU60

16AU38

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3.5 MNES offset values

Suitable MNES habitat within the offset area was identified based on ground-truthed RE, habitat values identified through field surveys across Lots 31 and 32 AU60, the known ecology of the MNES species significantly impacted by the Project and additional desktop analysis. An overview of how suitable habitat was defined for each species and its extent within the offset area is provided in **Table 3.2**. Defined areas of suitable habitat and nearby species records are shown on **Figure 3.3**.

Table 3.2: Habitat mapping rules and available habitat for each MNES within the offset area

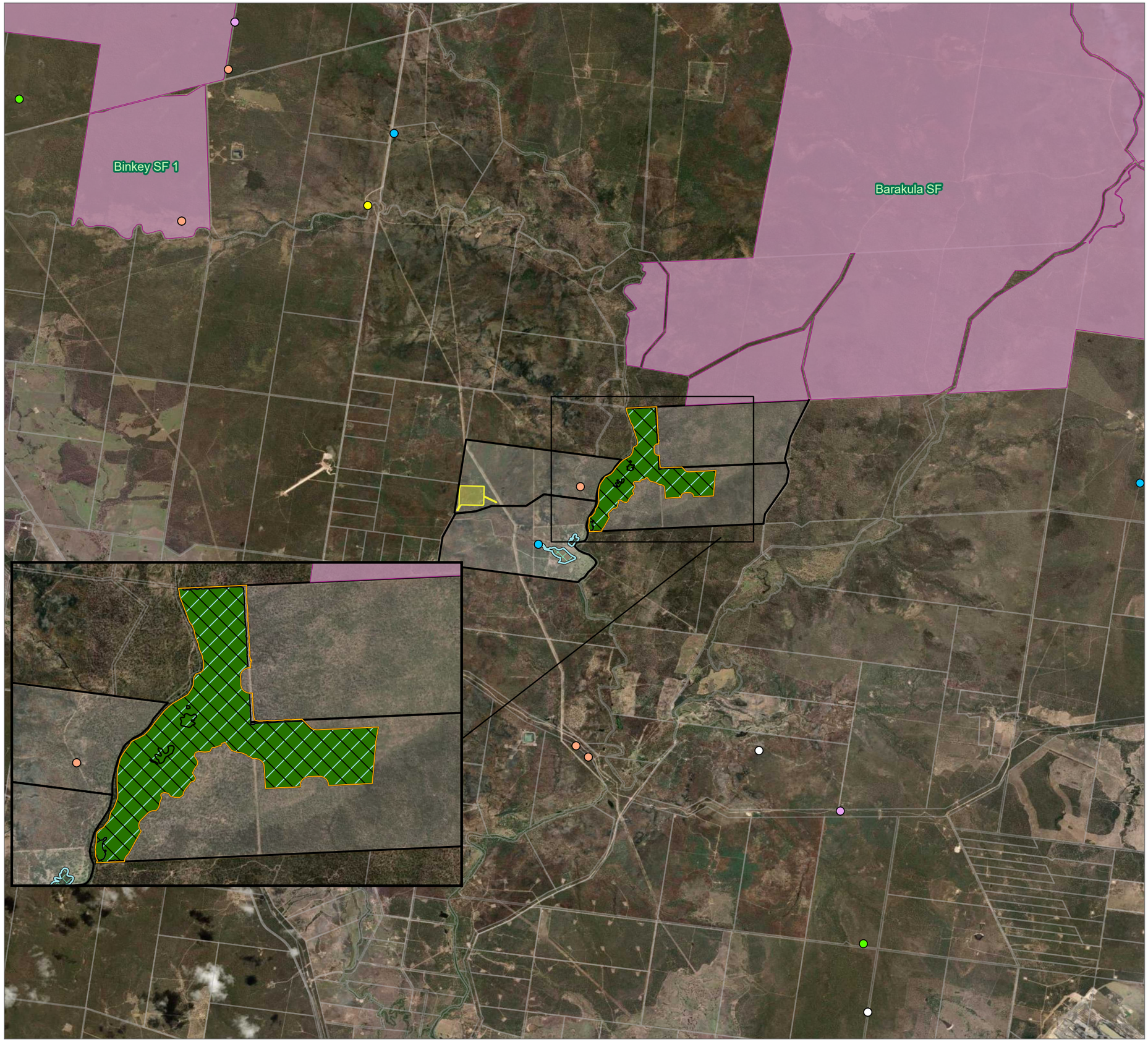
MNES	Suitable RE	Habitat mapping rules	Habitat within offset area (ha)
Corben's long eared bat	11.3.4, 11.3.14 11.3.25, 11.3.27f, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7	Species is known to occupy vegetated communities in which they are also known to roost. All remnant and regrowth vegetation communities are considered to provide foraging and roosting opportunities for the species. Adjacent areas of non-remnant vegetation, located within 100m of remnant habitat, were also included as suitable foraging habitat.	292.2
Diamond Firetail	11.3.4, 11.3.14 11.3.25, 11.3.27f, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7	This species is known to utilise a wide range of vegetated and non-vegetated habitats, as it feeds on grass seeds. All remnant, regrowth and non-remnant vegetation communities described within the offset area likely constitute habitat for this species.	292.2
South-eastern glossy black-cockatoo	11.3.4, 11.3.14 11.3.25, 11.5.1, 11.5.4, 11.5.20,11.5.21, 11.7.7	This species has specific foraging and roosting habitat requirements. Foraging habitat for this species includes all vegetation communities that can contain known foraging tree species (see **Appendix A**). Considering their reliance on large tree hollows for roosting, suitable roosting habitat has been defined as all remnant vegetation communities within 200 m of major watercourses (stream order 4-5)	286.4
Koala	11.3.4, 11.3.14 11.3.25, 11.3.27f, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7	The koala can utilise a wide range of vegetation communities and is also known to disperse over large distances. All remnant, regrowth and non-remnant vegetation communities that contain foraging resources have been mapped as suitable habitat for this species.	292.2
Dunmall's snake	11.3.4, 11.3.14 11.3.25, 11.3.27f, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7	The species relies on the presence of microhabitat features for shelter as well as the availability of prey species (i.e. small invertebrates including geckos and skinks). The species is known to shelter under fallen timber, ground litter and within cracks in alluvial clay soils typically associated with black cracking clays dominated by *Acacia*, *Callitris* or *Allocasuarina* species or on sandstone derived soils dominated by *Eucalyptus, Corymbia, Callitris* and *Allocasuarina*. All remnant and regrowth vegetation within the offset area has been mapped as suitable habitat.	290.2
Squatter pigeon	11.3.4, 11.3.14 11.3.25, 11.3.27f, 11.5.1, 11.5.4,	The species occurs within open forest to sparse open woodlands typically dominated in the overstory by *Eucalyptus, Acacia, Callitris* and *Melaleuca* species. The	290.2

MNES	Suitable RE	Habitat mapping rules	Habitat within offset area (ha)
	11.5.20, 11.5.21, 11.7.7	species is heavily reliant on groundcover vegetation within proximity of a permanent water source for both suitable foraging and nesting habitat. All remnant and regrowth vegetation communities within approximately 1.7 km of a permanent water source has been mapped as suitable foraging habitat.	

SGP NORTH SOLAR FARM

Offset Proposal

Figure 3.3
MNES offset value habitat



Development Footprint (30.1 ha)

Offset Area (302.9 ha)

MNES Species:

- Corben's Long-eared Bat
- Diamond Firetail
- Dunmall's Snake
- Glossy Black-cockatoo
- Koala
- Squatter Pigeon

Girrahween Station

Reservoirs

Base Lot Type Parcel

Suitable Habitat:

Glossy Black-Cockatoo

Dunmall's Snake, Squatter Pigeon

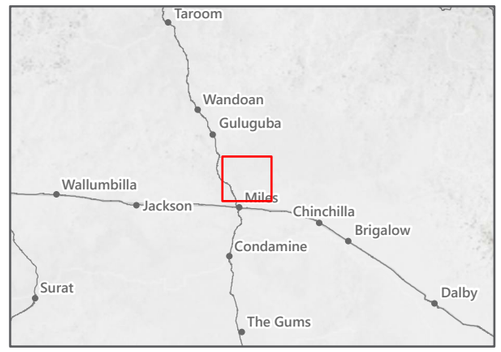
Corben's Long-Eared Bat, Diamond Firetail and Koala

Protected areas and forests of Queensland:

State Forest

DRAWN: KB
REVIEWED: MW

DATE: 1/06/2026
DWG No.: ARR-005_076[C]



N

0 km 2.5

SCALE (A3): 1:100,000

Attexo

Data Source:Not to be used as a definitive absolute location of reserve boundaries. This dataset is derived from the Digital Cadastre Database (DCDB). The accuracy of the spatial representation is determined by the accuracy of records in the version of the DCDB from which this dataset was derived., © State of Queensland (Department of Resources) 2024, © State of Queensland (Department of Resources), 2023, Earthstar Geographics, © OpenStreetMap contributors, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS, Vantor

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3.5.1 Corben's long-eared Bat

3.5.1.1 Habitat description

The Corben's long-eared bat appears to be more concentrated around patches of vegetation in the landscape which are likely used as roosting locations (under exfoliating bark or in tree hollows) (TSSC 2015). Suitable habitat for this species has been mapped to include all remnant and regrowth vegetation with the inclusion of all non-remnant vegetation as it occurs within 100 m of these ground truthed communities.

The offset area is dominated by a mixture of *Eucalyptus* and *Corymbia* vegetation communities of varying ages. Whilst most of these vegetation communities are described as remnant (68% of the offset area) and regrowth (28% of the offset area), much of this area has been degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). The fire has reduced the abundance and overall cover of the shrub and ground layers within the offset area, potentially limiting the availability of foraging resources for this species. Despite this disturbance, much of the decorticating bark observed within this area appears to be intact indicating that roosting locations for this species may not have been significantly affected. The connectivity of this offset area to surrounding contiguous vegetation is likely to be beneficial for this species during periods of limited resource availability, such as those caused by bushfires or droughts.

Whilst no Corben's long-eared bat records have been recorded within the offset area, several historical records have been identified within nearby contiguous vegetation, the closest of which occurs within the broader Girrawheen Station approximately 0.5 km to the west from 2013 (ALA 2025; **Figure 3.3**). Other records observed between 2000 and 2002 have been recorded in Binkey State Forest (approximately 12 km to the north-west) and Barakula State Forest (approximately 70 km to the north-east), both of which are connected via contiguous vegetation to the offset area, supporting the likelihood that local populations may utilise these habitat values. Little is known about the home range of individual (or groups of) Corben's long-eared bats; however, the conservation advice suggests their home range is likely to be large considering their reliance on large stands of wooded vegetation (TSSC 2015a). In addition, the species potential usage of the offset area is comparable to that at the Development footprint given its close proximity.

Due to the cryptic nature of this species, and the fact that they cannot be positively identified using passive acoustic detection, it is difficult to confirm their usage of the offset area. Based on the proximity of nearby records and the contiguous nature of the available habitat, their usage or potential usage has been inferred with ongoing targeted surveys proposed to be undertaken as part of the monitoring program detailed in the OMP.

3.5.1.2 Threats and conservation initiatives

Several conservation and management priorities have been identified for the Corben's long-eared bat (TSSC 2015). The conservation actions most relevant to the establishment of the offset area include:

- Protection of known and potential habitat from habitat loss and fragmentation.
- Retaining hollow-bearing trees and providing for hollow tree recruitment, wherever possible.
- Consideration of species-specific requirements as part of fire management plans.
- Implementation of control programmes for feral pests.
- Managing impacts of livestock grazing pressure.

The key threatening processes identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss, degradation and fragmentation such that local populations have insufficient foraging and roosting opportunities.
- Inappropriate fire regimes.
- Habitat degradation caused by an overabundance of livestock grazing.

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes occurring. Implementation of the offset will prevent future habitat loss and degradation of habitat associated with

future resource development, provide additional protection from future unplanned fire events and manage degradation of habitat associated with livestock grazing. The offset area is also connected to Barakula State Forest, the largest State Forest in Queensland and the Southern Hemisphere spanning 283,000 ha, through contiguous remnant vegetation and Bottle Tree Creek. The protection and ongoing management of the offset area will enhance the connectivity and extent of protected wildlife corridors to support movement and viability of populations across the landscape. Restoration planting within regrowth and non-remnant areas of offset will actively support regeneration of vegetation communities to create additional foraging resources and/or shelter habitat for this species to utilise.

3.5.2 Diamond firetail

3.5.2.1 Habitat description

The diamond firetail can occur in *Eucalypt, Acacia* or *Casuarina* woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees (DCCEEW 2023a). Due to the wide range of habitats that this species can utilise, the entire offset area (292.2 ha) is mapped as suitable habitat for this species. Considering the proximity of the impact and offset areas (approximately 2 km apart), it is possible that any locally occurring populations may utilise both areas, however diamond firetails are generally regarded as being sedentary and not typically prone to seasonal movements or long-distance travel.

Some authors, however, have noted seasonal movement between denser and more open environments. O'Gorman (1981) documented regular annual movements from their spring/summer breeding areas in the Grampians (National Park in Victoria) to the more open mallee plains to the north-west where the birds spent the winter. Another study, in the Mt Lofty Ranges of South Australia, found that this species completely disappeared from revegetation sites in winter, with individuals recorded up to 2 km away from their original banding location (DEH 2008).

The offset area is dominated by a mixture of *Eucalypt* and *Corymbia* vegetation communities of varying ages. Whilst most of these vegetation communities have been described as remnant (68% of the offset area) and regrowth (28% of the offset area), much of this area has been degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). This fire appears to have reduced the abundance and overall cover of the ground layer within the offset area, potentially limiting the availability of foraging resources for this species. Remaining and recovering native perennial grass species observed across the offset area include but are not limited to *Aristida gracilipes, A. caput-medusae, Lomandra longifolia, Entolasia stricta* (wiry panic), *Eriachne mucronata* and *Themeda triandra (kangaroo grass)*. The connectivity of the offset area to surrounding contiguous vegetation is likely to be beneficial for this species during periods of limited resource availability, such as those caused by bushfires or droughts.

Whilst no diamond firetails have been recorded within the offset area, numerous historical records are identified in the region surrounding the offset, the nearest of which is approximately 26 km to the north-west from 2019 (ALA 2025; **Figure 3.3**). There are also several spatially concealed records of this species throughout Barakula State Forest suggesting that this species may be common throughout contiguous vegetation to the north and east of the offset area. Based on the proximity and abundance of nearby records, and the contiguous nature of the available habitat, their usage or potential usage has been inferred.

3.5.2.2 Threats and conservation initiatives

Several conservation and management priorities that have been identified for the diamond firetail (DCCEEW 2023a). The conservation actions most relevant to the establishment of the offset area include:

- Protection and maintenance of areas of high-quality habitat, which includes open forest, woodland, mallee and grasslands with a diverse ground layer dominated by a mixture of grass species which seed at different times of the year.
- Consideration of species-specific requirements as part of fire management plans.
- Active management of pest and pastoral grazing in occupied patches, including control of overabundant herbivores.

- Increase in the prevalence and diversity of food plants by restoring native perennial grasses, while implementing targeted control of herbaceous weeds.

The key threatening processes that have been identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss, degradation and fragmentation such that local populations have insufficient foraging and roosting opportunities.
- An overabundance of weed species degrading suitable foraging habitat
- Habitat degradation caused by an overabundance in pastoral grazing.
- Inappropriate fire regimes.

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes. Implementation of the offset will protect habitat values for this species and provide a wide range of seasonal foraging resources. The establishment of the offset area will prevent future habitat loss and degradation of habitat associated with resource development, provide protection from future unplanned fire events, and reduce the impact of weed and pest animals on species habitat and its viability. The protection and ongoing management of the offset area will enhance the connectivity and extent of protected foraging and roosting opportunities for the species across the landscape. Restoration planting within regrowth and non-remnant vegetation communities throughout the offset area will support active regeneration to create additional foraging resources and/or shelter habitat for this species to utilise.

3.5.3 South-eastern glossy black-cockatoo

3.5.3.1 Habitat description

South-eastern glossy black-cockatoos feed almost exclusively on the seeds of she-oaks (*Allocasuarina* spp. and *Casuarina* spp.), usually relying on one or two species within a given region (DCCEEW 2022). They are also known hollow nesters who prefer large hollows in both living and dead eucalypt trees. Considering these habitat preferences, most of the offset area (286.4 ha; excluding 11.3.27f and the non-remnant RE 11.5.21 community in the south-western corner) has been mapped as suitable habitat for this species, including:

- Remnant and regrowth vegetation communities known to contain foraging resources or provide suitable roosting habitat for this species including REs 11.3.4, 11.3.14, 11.3.25, 11.5.1, 11.5.4, 11.5.20, 11.5.21 and 11.7.7.
- All remnant vegetation within 200 m of Bottle Tree Creek as these areas are more likely to contain large hollow bearing trees that this species can utilise as roosting habitat, with hollow bearing trees observed during field surveys of the offset area.

The offset area is dominated by a mix of *Eucalypt* and *Corymbia* vegetation communities of varying ages. Whilst most of these vegetation communities have been described as remnant (68% of the offset area) and regrowth (28% of the offset area), much of this area has been degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Buloke (*Allocasuarina luehmannii*) (listed as an occasional food resource for this species) was observed through the offset area within remnant and regrowth patches; however, canopy cover and recruitment of species for foraging was relatively low, whilst the area still recovers from the recent bushfires. The connectivity of this offset area to surrounding contiguous vegetation is likely to be beneficial for this species during periods of limited resource availability, such as those caused by bushfires or droughts.

Considering the proximity of the impact and offset areas (~ 2 km apart) and the similarities in the mapped vegetation communities, it is likely that any locally occurring populations will travel between these two areas. Whilst no south-eastern glossy black-cockatoo's have been recorded within the offset area, several historical records have been identified in the surrounding region, the nearest of which being approximately 1.5 km to the south-west from 2013 (ALA 2025; **Figure 3.3**). There are also numerous records of this species throughout Barakula State Forest suggesting that it may be common in the surrounding area but restricted to certain patches of suitable foraging habitat. Research suggests that even within foraging habitat, populations may prefer specific feed tree species, resulting in a patchy distribution within their range (DCCEEW 2022). Based on the proximity and abundance of nearby records, and the contiguous nature of the available habitat, their usage or potential usage of the offset site has been inferred.

3.5.3.2 Threats and conservation initiatives

Considering the key conservation and management actions outlined for this species in its conservation advice (DCCEEW 2022), the development and ongoing management of the offset area will contribute to these initiatives. The conservation actions most relevant to the establishment of the offset area include:

- Protection and enhancement of the quality of known suitable habitat (both breeding and foraging).
- Development of site-based fire management strategies (for both prescribed burning and fire suppression activities) with local authorities which considers the ecological needs of the subspecies.
- Consultation with local authorities to determine the appropriate methods and the effectiveness of weed control and introduced herbivore management and implement recommendations.

The key threatening processes that have been identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss, degradation and fragmentation such that local populations have insufficient foraging and roosting opportunities.
- Inappropriate fire regimes.
- Habitat degradation caused by an overabundance in pastoral grazing.
- Direct mortality from pest species (particularly cats and foxes).

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes occurring. Implementation of the offset will protect both existing and future habitat (foraging and roosting), prevent future habitat loss and degradation associated with future resource development, and support the maturation of habitat to provide hollow bearing trees. In addition, the offset area will also provide protection from future unplanned fire events and reduce the impact of weed and pest animals on species habitat and its viability. The protection and ongoing management of the offset area will enhance the connectivity and extent of protected foraging and roosting opportunities for the species across the landscape. Restoration planting within regrowth vegetation communities throughout the offset area will actively restore and create additional foraging resources and shelter habitat for this species to utilise including prioritising species that are known to align with habitat requirements for the species (e.g. *Allocasuarina luehmannii)*.

3.5.4 Koala

3.5.4.1 Habitat description

Koalas are tree-dwelling, obligate folivores with a highly specialised diet. Their diet is defined by the availability and palatability of a limited variety of *Eucalyptus, Corymbia* and *Angophora* species (DAWE 2022a). The current definition of habitat for the koala includes land that has attributes that support this species (such as the presence of feed trees, connectivity to other habitat and proximity to areas with known koala populations) (DAWE 2022a). Koala habitat typically includes:

- Forests or woodlands, especially with a higher proportion of feed tree species, and may include remnant or non-remnant vegetation.
- Roadside and railway vegetation and paddock trees.
- Safe intervening ground for travelling between trees and patches to forage, shelter and reproduce.
- Access to vegetated corridors or paddock trees to facilitate movement between patches.

Several studies have also broadly recognised the koala's dispersal capabilities across cleared land (Melzer 1995; White 1999; Dique et al. 2003; Matthews et al. 2016). In addition to regular movements across the ground between trees within their own home ranges, koalas, particularly subadult males but also females, are known to generally disperse across distances of 1 to 3 km (but sometimes over 10 km).

The offset area supports the following LIKTs and AHTs as defined by Youngentob et al (2021):

- *Eucalyptus chloroclada,*
- *Eucalyptus crebra,*

- *Eucalyptus exserta,*
- *Eucalyptus fibrosa,*
- *Eucalyptus longirostrata,*
- *Eucalyptus moluccana,* and
- *Eucalyptus populnea.*

Considering these factors, all remnant and regrowth vegetation within the offset area has been mapped as suitable breeding and foraging habitat (290.2 ha), and all non-remnant areas have been mapped as suitable dispersal habitat (~2 ha). In total 292.2 ha of suitable habitat has been mapped for the koala within the offset area.

The offset area is dominated by a mixture of *Eucalypt* and *Corymbia* vegetation communities of varying ages. Whilst most of these vegetation communities have been described as remnant (68% of the offset area) and regrowth (28% of the offset area), much of this area has been degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Whilst this fire does not appear to have significantly impacted mature vegetation across the offset area, it appears that the recruiting canopy and shrub layers were severely impacted, stunting the development of new foraging resources. The connectivity of this offset area to surrounding contiguous vegetation is likely to be beneficial for this species during periods of limited resource availability, such as those caused by bushfires or droughts.

Whilst no koalas have been recorded within the offset area, several historical and modern records have been identified in the surrounding region, the nearest modern record being approximately 19 km to the north-east from 2017 (ALA 2025; **Figure 3.3**). There are closer historical records to the offset area; however, these were all recorded in the late 1980s and are not necessarily representative of this species modern distribution. Contemporary koala records occur throughout Barakula State Forest and in areas south of Miles, Qld. Based on the proximity of nearby records, and the contiguous nature of the available habitat, their usage or potential usage of habitat values within the offset has been inferred, with ongoing targeted surveys proposed to be undertaken as part of the monitoring program detailed in the OMP.

3.5.4.2 Threats and conservation initiatives

Considering the key threats and conservation management actions outlined for this species in the National Recovery Plan for the Koala (DAWE 2022b), the development and ongoing management of the offset area will contribute to some of these objectives. One of the key objectives is the improvement of metapopulation processes through the improvement in indicators of ecosystem health. Management of the offset area will focus on the improvement in the quality of habitat for koala, as well as managing the risk of threatening processes that impact the future quality and viability of habitat.

The key threatening processes identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss, degradation and fragmentation such that local populations are unable to disperse between patches of suitable habitat.
- Inappropriate fire regimes.
- Pest animal interactions leading to fatalities (caused primarily by dogs).
- Fatalities cause by vehicle interactions.

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes and protect and improve habitat values for this species. The establishment of the offset area will prevent future habitat loss and degradation of habitat as a result of clearing associated with future resource development, provide protection from future unplanned fire events, and reduce the impact of pest animals. The protection and ongoing management of the offset area will enhance the connectivity and extent of protected habitat for the species across the landscape. Restoration planting within regrowth and non-remnant vegetation communities throughout the Offset area will assist support active regeneration creation of additional foraging resources and/or shelter habitat for this species to utilise. Planting will prioritise LIKT and AHT species to enhance breeding, foraging and shelter habitat for the koala across the offset area.

3.5.5 Dunmall's snake

3.5.5.1 Habitat description

The Dunmall's snake is a venomous snake in the Elapidae family. The species diet consists of small skinks and geckos (DoE 2014, DoE 2026) and it relies on microhabitat features for availability of prey species (Brown et al. 2008). The species is primarily nocturnal and is known to shelter under fallen timber, ground litter and within cracks in alluvial clay soils (DoE 2026, DoE 2014) and possibly prefers habitats between 200 and 500 m above sea level (DoE 2026). Habitats supporting Dunmall's snake are typically associated with black cracking clays dominated by *Acacia, Callitris* or *Allocasuarina* species. It can also occur on sandstone derived soils dominated by *Eucalyptus, Corymbia, Callitris* and *Allocasuarina* (DoE 2026). Considering these factors, a total of 290.2 ha of remnant and regrowth vegetation within the offset area has been mapped as suitable habitat for the species.

Very little is known about the home range, dispersal activity and movement patterns of Dunmall's snake (DoE 2026). However, the spatial ecology of Australian elapids that are similar in size and share habitat characteristics with Dunmall's snake (i.e. prey on small vertebrates including geckos and skinks and shelter under rocks and logs), has been well documented (Shine 1987, Macartney et al. 1988, Webb and Shine 1997, Whittaker and Shine 2003). Movement patterns of similar Australian elapids are limited naturally, with daily, monthly and even yearly movements between 3-300 m reported (Shine 1987, Webb and Shine 1997, Whittaker and Shine 2003). Typical movements of broad-headed snake (*Holocephalus bungaroides*), which is a smaller elapid that is closer in size and ecology to Dunmall's snake, rarely moved with average distances moved per month <200 m (Webb and Shine 1997). The closest recent record of Dunmall's snake to the offset area is ~8 km northwest. The connectivity of this offset area to surrounding contiguous vegetation also provides benefits for this species during periods of limited resource availability (i.e. droughts).

The offset area is dominated by a mixture of remnant and regrowth *Eucalyptus* and *Corymbia* vegetation communities. Key microhabitat features known to support suitable shelter habitat for the species were observed across the offset area including coarse woody debris and large log piles (DoE 2014). Habitat for Dunmall's snake will benefit from active management and restoration to enhance the recovery of impacts associated with recent bushfires to the shrub and ground layers and improve the quality of habitat to support the species.

3.5.5.2 Threats and conservation initiatives

Considering the species conservation advice (DoE 2014; DoE 2026), the Draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW 2023b) and the Threat abatement plan for predation by feral cats 2024 (DCCEEW 2024) the key threatening processes that have been identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss and fragmentation caused by land clearing.
- Habitat degradation associated with overgrazing by livestock.
- Predation by feral animals (e.g. feral cat).
- Inappropriate fire regimes resulting in a loss of fallen timber and ground litter.
- Invasion of weeds.

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes occurring and support the recovery of the species. Considering the key conservation and management actions outlined for this species in its conservation advice (DoE 2014; DoE 2026) and more recently in the Draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW 2023b), the development and ongoing management of the offset area will contribute to these initiatives through:

- Protection and enhancement of the quality of known suitable habitat to support the species to prevent future habitat loss and degradation associated with future resource development.
- Exclusion of grazing.
- Development of site-based fire management strategies (for both prescribed burning and fire suppression activities) with local authorities which considers the ecological needs of the species.

- Implementation of weed and pest animal management activities to reduce their impact on Dunmall's snake habitat and viability.
- Restoration planting within regrowth areas to expand habitat for locally occurring Dunmall's snake populations.

3.5.6 Squatter pigeon

3.5.6.1 Habitat description

The squatter pigeon is a granivorous species that occurs within open forest to sparse open woodland typically dominated in the overstory by *Eucalyptus, Acacia, Callitris* and *Melaleuca* species (DoE 2026b). The species is heavily reliant on groundcover vegetation within proximity of a permanent water source for both suitable foraging and nesting habitat. Previous advice suggested that foraging habitat was likely located within 3 km of permanent water and breeding habitat was located within 1 km (DoE 2026a), however, based on the results of the Lloyd *et al.* (2025) analysis this is more likely to be within 1.7 km and 500 m of permanent water, respectively (Lloyd *et al.* 2025).

The subspecies is thought to be sedentary but has been observed dispersing locally between cleared areas and adjacent natural grasslands and highly modified or degraded habitat (i.e. pastures, stockyards, road reserves) to forage for seed on the ground, drink from stock troughs or dams, and dust bathe on bare ground (DoE 2026b; Squatter Pigeon Workshop 2011). The subspecies is less likely to be found on heavier soils with dense grass but can often be found in burnt areas and alongside tracks and roadsides (Ward et al 2021).

The offset area is dominated by a mixture of *Eucalyptus* and *Corymbia* vegetation communities of varying ages. Whilst most of these vegetation communities have been described as remnant (68% of the offset area) and regrowth (28% of the offset area), much of this area has been degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). This fire appears to have reduced the abundance and overall cover of the ground layer within the offset area, potentially limiting the availability of foraging resources for the squatter pigeon. The connectivity of this offset area to surrounding contiguous vegetation is likely to be beneficial for this species during periods of limited resource availability, such as those caused by bushfires or droughts.

All remnant and regrowth vegetation communities (290.2 ha) are considered to support foraging habitat for squatter pigeon with multiple permanent water sources within approximately 1.7 km of the offset area (**Figure 3.3**). The nearest record is approximately 9 km to the south of the offset area with several squatter pigeon records identified in the surrounding region including Binkey State Forest, Cherwondah State Forest and Barakula State Forest (**Figure 3.3**). Direct connectivity with Barakula State Forest will provide opportunities to extend movement and dispersal corridors for the species.

3.5.6.2 Threats and conservation initiatives

Considering the species conservation advice (TSSC 2015b; DoE 2026b) and threat abatement plan for predation by feral cats (DCCEEW 2024) the key threatening processes that have been identified for this species and incorporated into the resulting MHQA method (**Appendix A**) include:

- Habitat loss caused by land clearing.
- Habitat degradation by livestock grazing.
- Invasion of weeds (especially buffel grass).
- Predation by pest animals including fox, and feral cats.
- Increase in frequency, scale or intensity of fire.

The protection and ongoing management of the offset area will reduce the risk of the identified threatening processes occurring and support the recovery of the species. Considering the key conservation and management actions outlined for this species in its conservation advice (TSSC 2015b) and related threat abatement plans (DoE 2026b; DCCEEW 2024), the development and ongoing management of the offset area will contribute to these initiatives through:

- Protection and enhancement of the quality of known suitable foraging and breeding habitat to support the species to prevent future habitat loss and degradation associated with resource development.
- Exclusion of grazing.
- Development of site-based fire management strategies (for both prescribed burning and fire suppression activities) with local authorities which considers the ecological needs of the species.
- Implementation of weed and pest animal management activities to reduce their impact on squatter pigeon habitat and viability.
- Restoration planting within regrowth areas to expand habitat for locally occurring squatter pigeon populations.

3.6 Weed cover

Weed surveys were undertaken across September 2025 and August 2026 as part of the baseline field survey program to assess the abundance and richness of non-native species including WoNS, restricted invasive plants under the *Biosecurity Act 2014* (Qld) and restricted pest weeds listed by the Western Downs Regional Council.

Baseline weed surveys were undertaken at 26 surveys sites within the offset area as shown in **Figure 3.4**. These sites also aligned with the BioCondition transects used to assess the site condition attributes as part of the habitat quality assessments (**Section 4**). At each site a 50 x 10 m quadrat was established to assess the percentage weed cover and record species richness. In addition to the weed surveys, baseline photos were taken at the centre point of each BioCondition transect in a north, east, south, west and ground direction to provide a visual means to detect changes in weed cover as well as native vegetation composition, structure and integrity over time.

A detailed summary of the weed survey and photo monitoring method is provided in **Appendix B**, with the results of the weed surveys and photo monitoring included in **Appendix C.**

Based on the outcomes of baseline weed surveys 11 species were observed within the offset area with the most prevalent species being *Glandularia aristigera*, *Oxalis corniculata*, *Megathyrsus maximus* and *Melinis repens* (**Table 3.3**). *Opuntia tomentosa* (velvety tree-pear) was also observed across the broader offset property; however, was not recorded within the offset area. The average weed species richness per plot was 1.5 species ranging from 0-6 species observed per plot across the sites (**Appendix C**). The average % weed cover per plot was 2.5%, ranging from 0-12% cover across the sites (**Appendix C**)**.** Weed species richness and cover was most prevalent in sites along and adjacent to Bottle Tree creek with the highest % cover observed at site G12 as shown on **Figure 3.4**.

Table 3.3: Baseline weed survey results within the offset area

Scientific Name	Common Name	Biosecurity Status in QLD*	Number of sites observed at	Total % cover
Bidens pilosa	Cobbler's pegs	GBO applies	1	1
Calyptocarpus vialis	Straggler daisy	GBO applies	2	2
Chamaecrista rotundifolia	Round-leaf cassia	GBO applies	1	1
Erigeron bonariensis	Flaxleaf fleabane	GBO applies	1	1
Glandularia aristigera	Moss verbena	GBO applies	12	25
Heliotropium amplexicaule	Blue heliotrope	GBO applies	2	3
Megathyrsus maximus	Guinea grass	GBO applies	5	14
Melinis repens	Natal grass	GBO applies	6	10

Scientific Name	Common Name	Biosecurity Status in QLD*	Number of sites observed at	Total % cover
Oxalis corniculata	Creeping woodsorrel	GBO applies	7	7
Pannicum spp.	Panic grasses	GBO applies	1	1
Silybum marianum	Milk thistle	GBO applies	1	1

* GBO (General Biosecurity Obligation): Even if a species is not listed as restricted or prohibited, landholders and managers are still required to take reasonable and practical steps to prevent its spread.

3.7 Pest animals

Pest animal surveys were undertaken across Lots 31 and 32 AU60 in July and August 2025 through the deployment of remote sensing camera traps to determine pest animal species presence and activity. Cameras were deployed at 12 sites for a total of 3,827 trap hours. At each site an Activity Index (AI) was calculated for each pest species identified, informed by methods in Jenks et al. (2011), and as described in the Project's MHQA method (**Appendix A**), **Appendix B** and OMP.

Three pest species were confirmed within the offset area during baseline surveys including the European hare (**Plate 12**), feral cat (**Plate 13**) and feral pig (**Plate 14**). The baseline AI for these species is presented in **Table 3.4.** Although not recorded during baseline surveys, wild dogs and foxes are known to occur in the region and are known threats to some MNES offset values. Baseline survey pest animal survey results are presented in **Appendix C.**

Table 3.4: Pest animals identified in the offset area during 2025 baseline surveys and known to occur within the region

Scientific Name	Common Name	Biosecurity Classification in QLD	Baseline AI score
Felis catus	Feral Cat*	Restricted invasive animal – Category 3, 4 and 6	0.1306
Canis familiaris	Wild Dog	Restricted invasive animal – Category 3, 4 and 6	0
Vulpes vulpes	European red fox	Restricted invasive animal – Category 3, 4, 5 and 6	0
Lepus eropaesus	European hare*	Not listed	0.0261
Sus scrofa	Feral pig*	Restricted invasive animal – Category 3, 4 and 6	0.0261

* Pest species was recorded during survey efforts across the offset area

Plate 12 European hare observed within the offset area



Plate 13 Feral cat observed within the offset area



Plate 14 Feral pig observed within the offset area



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Offset Proposal

Figure 3.4
Weed survey results

Bottle Tree Creek

31AU60

32AU60

17AU199

16AU38

G25 3
G26 0
G12 3
G10 3
G33 0
G38 0
G8 0
G3 2
G20 2
G4 4
G5 3
G7 1
G9 0
G13 6
G6 1
G11 1
G28 0
G39 1
G35 1
G23 0
G21 4
G22 4
G29 0
G18 0
G36 0
G37 0

Major Watercourse

Minor Watercourse

Girrahween Station

Offset Area (302.9 ha)

Total Weed Cover (%):

- 0%
- <5%
- 5-10%
- 10-50%
- 50-100%

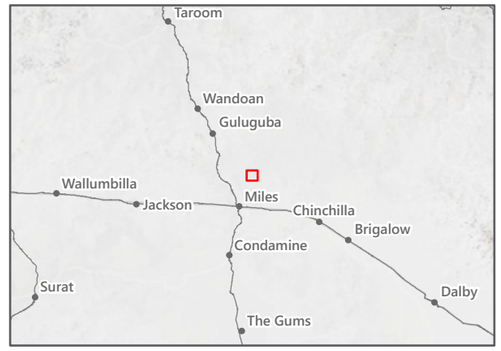
0 ← Number of weed species within weed monitoring plot

Weed monitoring plot symbology & weed cover

G1 ← Weed monitoring plot number

DRAWN: KB
REVIEWED: MW

DATE: 11/09/2026
DWG No.: ARR-005_077[E]



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SCALE (A3): 1:22,500

Attexo

Data Source:© State of Queensland (Department of Resources), 2023, © State of Queensland (Department of Resources) 2024, Vantor, © OpenStreetMap contributors, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

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3.8 Threats

A summary of the threatening processes identified for the offset area that are considered a potential impact on the future quality of habitat and conservation of each species is provided in **Table 3.5**. The listed threats have been identified based on the outcomes of baseline surveys in the offset area, information collected as part of the Development footprint survey effort as well as key conservation initiatives for the species in published conservation advice, threat abatement plans and reputable research.

The property was originally purchased by Arrow CSG for the purpose of expanding their CSG development operations. Arrow CSG is committed to the legal security and in perpetuity protection of the offset area to exclude any future development to prevent the loss and fragmentation of MNES species' habitat. Legal security of the offset area will also prevent future, unrestricted clearing of vegetation within mapped Category X areas on the RVMM that comprise approximately 42% (127.8 ha) of the offset area (**Figure 3.5**).

Following Arrow CSG's acquisition of the property it has been subject to ongoing livestock grazing under an agistment agreement. The property is also at risk of inappropriate fire regimes and unplanned fire events, given the significant damage caused by the recent bushfire in 2022-2023, that could result in further degradation to habitat quality and availability to the MNES offset values.

The identified threatening processes have been incorporated into the MHQA method and have informed preparation of the OMP to ensure the protection, management and monitoring of the offset area minimises the risk of these processes occurring and results in an improvement in the quality and viability of MNES habitat to support the species.

Table 3.5: Identified and known threatening processes within the offset area for each MNES offset value

Identified threat	MNES offset value					
	Corben's long eared bat	Diamond firetail	South-eastern glossy black-cockatoo	Koala	Dunmall's snake	Squatter pigeon
Loss, clearing and fragmentation of vegetation reducing habitat availability	✓	✓	✓	✓	✓	✓
Inappropriate fire regimes resulting in loss or alteration of habitat and/or reduction in habitat quality	✓	✓	✓	✓	✓	✓
Habitat degradation caused by an overabundance and/or inappropriate pastoral grazing	✓	✓	✓		✓	✓
Habitat degradation associated with an overabundance of weed cover and species		✓			✓	✓

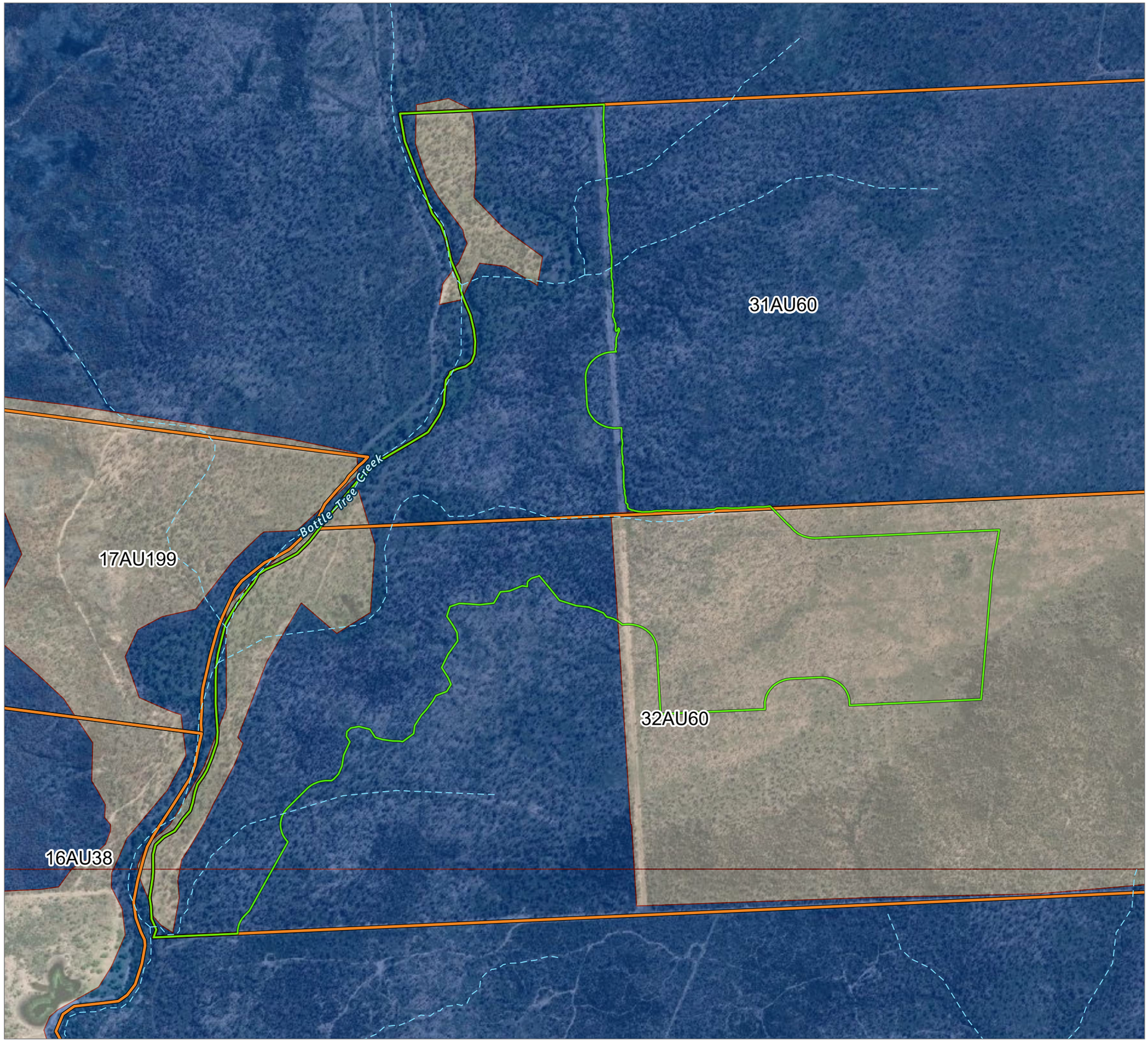
Identified threat	MNES offset value					
	Corben's long eared bat	Diamond firetail	South-eastern glossy black-cockatoo	Koala	Dunmall's snake	Squatter pigeon
Direct mortality from pest species (e.g. feral cat, wild dog, fox)			✓	✓	✓	✓
Fatalities cause by vehicle interactions				✓		

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Offset Proposal

Figure 3.5

Offset area Regulated Vegetation Management Map



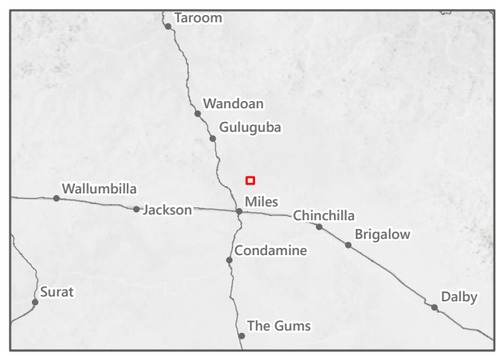
- Minor Watercourse
- Girrahween Station
- Offset Area (302.9 ha)

Regulated Vegetation Management Mapping:

- Category B
- Category X

DRAWN: KB
REVIEWED: MW

DATE: 22/05/2026
DWG No.: ARR-005_084[C]



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4. Habitat Quality Assessments

4.1 Project MHQA method

A Project-specific MHQA method (**Appendix A**) has been developed to assess habitat quality for MNES within the Development footprint and the offset area to inform input into the offsets assessment guide in accordance with the DCCEEW's Guidance on the use of the Modified Habitat Quality Assessment Method (DCCEEW 2025). To ensure a consistent approach is undertaken for both baseline and future assessments, the project specific MHQA method outlines:

- how the MHQA method has been applied including specific scoring procedures for ***site condition***, ***site context*** and ***species stocking rate***, particularly where these differ from the DEHP Guide (DEHP 2017), and
- specific scoring procedures and metrics for selected parameters for each MNES where applicable.

Table 4.1 provides a summary of the indicators and attributes that are assessed as part of the MHQA method. While most scoring procedures are prescribed in the Guide (DEHP 2017), some inputs require assessment of matter-specific parameters to ensure scoring accuracy and consistency. Scoring for these matter-specific parameters are undefined in DCCEEW's Guidance on the use of the Modified Habitat Quality Assessment Method (DCCEEW 2025) and therefore scoring methods and metrics have been developed for the unique ecological requirements and/or identified threatening processes of the MNES under assessment for the Project, as presented in **Appendix A**.

The scoring methodology has been consistently applied at both the Development footprint and offset area for each matter. Scores have been populated in the assessment-template-MHQA-spreadsheet provided by DCCEEW with the PD RFI, which has been modified to reflect the specific scoring approach outlined in the project specific MHQA method. The modified MHQA-spreadsheet for each MNES accompanies this Offset Proposal to provide a comprehensive summary of the raw data collected and habitat quality score calculations in accordance with the project specific MHQA method. Each spreadsheet provides the habitat quality score calculations for the impact and offset area, including MNES specific scoring calculations and justifications. The spreadsheets must be reviewed in conjunction with this Offset Proposal. To support the site context scores provided in the MHQA spreadsheet, working figures for size of patch, connectedness, context and ecological corridors are provided in **Appendix D**.

The habitat quality scores have been used to inform the inputs into the offsets assessment guide which is further discussed in **Section 5.1.**

Table 4.1 MHQA assessment components – indicators and attributes

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

	Indicators		
	Site condition	**Site context**	**Species stocking rate**
	Tree canopy cover	Species mobility capacity (fauna only)	
	Shrub canopy cover		
	Native perennial grass cover		
	Organic litter		
	Large trees		
	Coarse woody debris		
	Non-native plant cover		
	Quality and availability of food and foraging habitat (fauna only)		
	Quality and availability of shelter (fauna only)		
Assessment Scale	**Assessment Unit**	**Matter Area**	**Matter Area**

4.2 Development footprint habitat quality

To inform habitat quality scoring the Development footprint was stratified into two assessment units. Assessment units were primarily defined by RE and vegetation growth category (i.e. regrowth or non-remnant vegetation), where suitable areas of these communities were identified (**Table 4.2**).

At the time of the BioCondition surveys in July 2025, a total of eight site assessments were undertaken in accordance with the MHQA method to provide a comprehensive assessment of the broader study area[1]. The location of these sites is provided in **Figure 2.1**. Following confirmation of the final Development footprint, the results of six of the eight assessment sites were used to inform the final habitat quality of the MNES within the impact area, as presented in **Table 4.2**.

Two of the assessment sites (BC02 and BC03) used to inform the final habitat quality scores are located outside of the Development footprint. Given they are located within vegetation that is contiguous with that of the Development footprint, their habitat quality scores are still considered representative of the condition of vegetation within the Development footprint and have been included to provide a robust assessment of habitat quality at the impact area.

Table 4.2: Development footprint assessment units (AU) and their associated RE and assessment site

AU	RE	AU area (ha)	No. assessment sites	Assessment site reference
AU1	RE 11.5.1 regrowth	19.8	3	BC02*, BC04, BC06
AU2	Non-remnant (RE 11.5.1)	10.3	3	BC01, BC03*, BC05
Total		**30.1**		

*Located outside of the Development footprint

[1] Study area – refers to the area for which the ecological investigations (as illustrated and discussed in Section 4.2 of the Preliminary Documentation) have been undertaken for the Project. The Study area includes the Development footprint as well as immediately adjoining vegetation / habitat up to the nearest existing cleared corridor/access road/boundary.

A summary of the habitat quality score components for the MNES across the Development footprint and the final weighted habitat quality score for each assessment unit is provided in **Table 4.3** below, with additional detail provided in the MHQA-spreadsheet.

Table 4.3: Summary of the Development footprint habitat quality scores

AU	AU1	AU2
RE	**11.5.1 regrowth**	**Non-remnant (11.5.1)**
Area (ha)	**19.8**	**10.3**
Corben's long-eared bat		
Site Condition score (/ 5)	3.5	3.4
Site Context Score (/ 3)	1.5	1.5
Species Stocking Rate Score (/ 2)	1.0	1.0
Habitat Quality score (/ 10)	**6.0**	**5.9**
Weighting (AU area/30.1 ha)	*0.7*	*0.3*
Final HQ score	**5.99**	
Diamond firetail		
Site Condition score (/ 4)	3.1	3.0
Site Context Score (/ 3)	1.5	1.5
Species Stocking Rate Score (/ 3)	0.6	0.6
Habitat Quality score (/ 10)	**5.2**	**5.1**
Weighting (AU area /30.1 ha)	*0.7*	*0.3*
Final HQ score	**5.18**	
South-eastern glossy black-cockatoo		
Site Condition score (/ 4)	2.67	
Site Context Score (/ 3)	1.31	
Species Stocking Rate Score (/ 3)	1.07	*N/A*
Habitat Quality score (/ 10)	**5.06**	
Weighting AU area (/19.8 ha)	*1*	
Final HQ score	**5.06**	
Koala		
Site Condition score (/ 3)	1.97	2.02
Site Context Score (/ 3)	1.37	1.37
Species Stocking Rate Score (/ 4)	0.86	0.86
Habitat Quality score (/ 10)	**4.20**	**4.25**
Weighting (AU area /30.1 ha)	*0.66*	*0.34*
Final HQ score	**4.22**	

AU	AU1	AU2
RE	11.5.1 regrowth	Non-remnant (11.5.1)
Area (ha)	19.8	10.3
Dunmall's snake		
Site Condition score (/ 5)	3.88	
Site Context Score (/ 3)	1.62	
Species Stocking Rate Score (/ 2)	0.75	*N/A*
Habitat Quality score (/ 10)	***6.26***	
Weighting (AU area /19.8 ha)	*1*	
Final HQ score	**6.26**	
Squatter pigeon		
Site Condition score (/ 4)	3.1	3.1
Site Context Score (/ 3)	1.5	1.5
Species Stocking Rate Score (/ 3)	0.6	0.6
Habitat Quality score (/ 10)	***5.3***	**5.2**
Weighting (AU area /30.1 ha)	*0.7*	*0.3*
Final HQ score	**5.3**	

4.3 Offset area habitat quality

The offset area has been stratified into 11 assessment units, defined by RE and vegetation growth category (i.e. remnant, regrowth or non-remnant vegetation), as presented in **Table 4.4.** BioCondition and habitat quality assessments were undertaken in September 2025 and August 2026 at sites across the offset area relative to the stratified assessment units to meet the requirements of the Guide (DEHP 2017), as presented in **Table 4.4**.

Figure 4.1 presents the location of the monitoring points assessed as part of the baseline surveys within the offset area. A summary of the results for each MNES is provided in **Table 4.5**, with additional detail provided in the MHQA-spreadsheet.

These sites will continue to be assessed as part of ongoing monitoring and management of the offset site as discussed in **Section 6** and the Project's OMP.

Table 4.4: Offset area assessment units (AU) and their associated RE and assessment site

AU	RE	AU area (ha)	No. assessment sites	Assessment site reference
AU1	11.3.4 Remnant	20.9	2	G10, G11
AU2	11.3.14 Remnant	5.8	2	G04, G05
AU3	11.3.27f Remnant	3.9	2	G08, G09
AU4	11.3.25 Remnant	8.1	2	G12, G13
AU5	11.5.1 Remnant	68.2	3	G33, G35, G38
AU6	11.5.1 Regrowth	78.7	3	G18, G36, G37
AU7	11.5.4 Regrowth	6.1	2	G03, G20
AU8	11.5.20 Remnant	5.1	2	G06, G07
AU9	11.5.21 Remnant	20.5	3	G23, G25, G39
AU10	11.5.21 Non-Remnant	2.0	2	G21, G22
AU12	11.7.7 Remnant	73.0	3	G26, G28, G29
Total		**292.2**		

Table 4.5: Summary of the offset area habitat quality scores

AU	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU12
RE	11.3.4 rem	11.3.14 rem	11.3.27 rem	11.3.25 rem	11.5.1 rem	11.5.1 reg	11.5.4 reg	11.5.20 rem	11.5.21 rem	11.5.21 non-rem	11.7.7 rem
Area (ha)	20.9	5.8 ha	3.9	8.1	68.2	78.7	6.1	5.1	20.5	2	73
Corben's long-eared bat											
Site Condition score (/ 5)	3.34	2.96	3.41	3.36	3.53	2.77	3.43	3.57	3.50	2.90	3.79
Site Context Score (/ 3)	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26	2.26
Species Stocking Rate Score (/ 2)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Habitat Quality score (/ 10)	**6.60**	**6.22**	**6.67**	**6.62**	**6.79**	**6.03**	**6.69**	**6.83**	**6.76**	**6.16**	**7.05**
Weighting (AU area/292.2 ha)	*0.07*	*0.02*	*0.01*	*0.03*	*0.23*	*0.27*	*0.02*	*0.02*	*0.07*	*0.01*	*0.25*
Final HQ score						**6.61**					
Diamond firetail											
Site Condition score (/ 4)	2.65	2.49	2.76	2.60	2.93	2.41	2.87	2.98	2.96	2.41	3.05
Site Context Score (/ 3)	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31	2.31
Species Stocking Rate Score (/ 3)	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64
Habitat Quality score (/ 10)	**5.59**	**5.43**	**5.71**	**5.54**	**5.88**	**5.36**	**5.82**	**5.92**	**5.91**	**5.36**	**6.00**
Weighting (AU area/292.2 ha)	*0.07*	*0.02*	*0.01*	*0.03*	*0.23*	*0.27*	*0.02*	*0.02*	*0.07*	*0.01*	*0.25*
Final HQ score						**5.73**					

AU	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU12
RE	**11.3.4 rem**	**11.3.14 rem**	**11.3.27 rem**	**11.3.25 rem**	**11.5.1 rem**	**11.5.1 reg**	**11.5.4 reg**	**11.5.20 rem**	**11.5.21 rem**	**11.5.21 non-rem**	**11.7.7 rem**
Area (ha)	**20.9**	**5.8 ha**	**3.9**	**8.1**	**68.2**	**78.7**	**6.1**	**5.1**	**20.5**	**2**	**73**
South-eastern glossy black-cockatoo											
Site Condition score (/ 4)	2.59	2.31	*N/A*	2.65	2.77	2.05	2.62	2.50	2.89	*N/A*	2.80
Site Context Score (/ 3)	2.23	2.23	*N/A*	2.23	2.23	2.23	2.23	2.23	2.23	*N/A*	2.23
Species Stocking Rate Score (/ 3)	1.29	1.29	*N/A*	1.29	1.29	1.29	1.29	1.29	1.29	*N/A*	1.29
Habitat Quality score (/ 10)	**6.10**	**5.82**	*N/A*	**6.16**	**6.28**	**5.56**	**6.13**	***6.01***	**6.41**	*N/A*	**6.31**
Weighting (AU area/286.4 ha)	*0.07*	*0.02*	*N/A*	*0.03*	*0.24*	*0.27*	*0.02*	*0.02*	*0.07*	*N/A*	*0.25*
Final HQ score						**6.07**					
Koala											
Site Condition score (/ 3)	1.90	1.80	1.99	1.94	2.21	1.65	2.12	1.95	1.99	1.70	2.20
Site Context Score (/ 3)	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07
Species Stocking Rate Score (/ 4)	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Habitat Quality score (/ 10)	**4.83**	**4.72**	**4.92**	**4.87**	**5.14**	**4.58**	**5.05**	**4.87**	**4.92**	**4.63**	**5.12**
Weighting (AU area/292.2 ha)	*0.07*	*0.02*	*0.01*	*0.03*	*0.23*	*0.27*	*0.02*	*0.02*	*0.07*	*0.01*	*0.25*
Final HQ score						**4.92**					
Dunmall's snake											
Site Condition score (/ 5)	3.40	3.10	3.45	3.36	3.75	3.01	3.50	3.81	3.66	*N/A*	3.92
Site Context Score (/ 3)	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	*N/A*	2.21
Species Stocking Rate Score (/ 2)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	*N/A*	0.75
Habitat Quality score (/ 10)	**6.36**	**6.06**	**6.41**	**6.32**	**6.71**	**5.97**	**6.46**	**6.77**	**6.62**	*N/A*	**6.88**

AU	AU1	AU2	AU3	AU4	AU5	AU6	AU7	AU8	AU9	AU10	AU12
RE	**11.3.4 rem**	**11.3.14 rem**	**11.3.27 rem**	**11.3.25 rem**	**11.5.1 rem**	**11.5.1 reg**	**11.5.4 reg**	**11.5.20 rem**	**11.5.21 rem**	**11.5.21 non-rem**	**11.7.7 rem**
Area (ha)	**20.9**	**5.8 ha**	**3.9**	**8.1**	**68.2**	**78.7**	**6.1**	**5.1**	**20.5**	**2**	**73**
Weighting (AU area/290.2 ha)	*0.07*	*0.02*	*0.01*	*0.03*	*0.24*	*0.27*	*0.02*	*0.02*	*0.07*	*N/A*	*0.25*
Final HQ score						**6.49**					
Squatter pigeon											
Site Condition score (/ 4)	2.86	2.67	3.02	2.88	2.97	2.43	2.97	2.95	3.18	*N/A*	3.19
Site Context Score (/ 3)	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	*N/A*	2.21
Species Stocking Rate Score (/ 3)	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	*N/A*	1.07
Habitat Quality score (/ 10)	**6.14**	**5.95**	**6.30**	**6.17**	**6.25**	**5.72**	**6.25**	**6.23**	**6.46**	*N/A*	**6.47**
Weighting (AU area/290.2 ha)	*0.07*	*0.02*	*0.01*	*0.03*	*0.24*	*0.27*	*0.02*	*0.02*	*0.07*	*N/A*	*0.25*
Final HQ score						**6.16**					

SGP NORTH SOLAR FARM

Offset Proposal

Figure 4.1
Baseline Survey Sites

Major Watercourse

Minor Watercourse

Girrahween Station

Offset Area (302.9 ha)

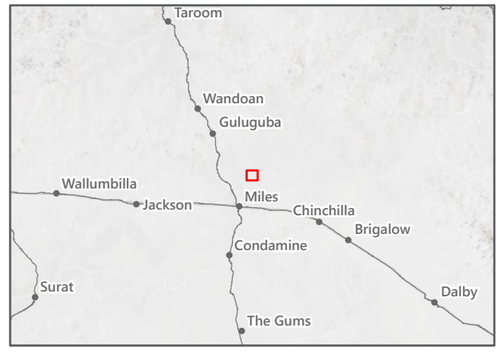
BioCondition sites

Ground-Truthed Regional Ecosystem Mapping:

- 11.3.14
- 11.3.25
- 11.3.27f
- 11.3.4
- 11.5.1
- 11.5.20
- 11.5.21
- 11.7.7
- Regrowth (11.5.1)
- Regrowth (11.5.4)
- Regrowth (11.7.4)
- Non-Remnant (11.5.21)
- Cleared

DRAWN: KB
REVIEWED: MW

DATE: 11/09/2026
DWG No.: ARR-005_078[E]



N

0 Km 1

SCALE (A3): 1:22,500

Attexo

Data Source:© State of Queensland (Department of Resources) 2024, © State of Queensland (Department of Resources), 2023, Earthstar Geographics, © OpenStreetMap contributors, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

C:\Users\KatieBoujalon\Aprm Limited\ARR-005 - SGP North SF Preliminary Documentation - 4. GIS\4.2 Workspaces\1TD_Offset_Proposal_and_management_plan\GIS\F_Offsets_and_Management_Plan_Figures - 20052026.aprx

5. Offset Suitability

5.1 Offset acquittal

The offset area acquits over 100% of the Project's significant residual impacts on habitat for Corben's long-eared bat, diamond firetail, south-eastern glossy black-cockatoo, koala, Dunmall's snake and squatter pigeon as determined in accordance with the EPBC Act offsets assessment guide.

Table 5.1 provides a summary of the EPBC Act offsets assessment guide inputs including the resulting % acquittal for each MNES. The % acquittal presented in **Table 5.1** represents the maximum area of available habitat for each MNES within the 302.9 ha offset area, with the size and location of the offset area chosen to collocate suitable habitat and acquit the minimum offset area required for each MNES.

The results of the baseline surveys undertaken at the impact and offset areas, including the calculated habitat quality scores for each MNES, were used to inform the relevant inputs and supporting justifications in the EPBC Act offsets assessment guide. The supporting justification for the EPBC Act offsets assessment guide inputs are outlined below in **Table 5.2**, with a copy of the EPBC Act offsets assessment guide calculator included as part of the accompanying MHQA spreadsheets.

Table 5.1: Summary of the EPBC Act offsets assessment guide inputs for each MNES

Offsets assessment guide input		MNES offset value					
		Corben's long eared bat	Diamond Firetail	South-eastern glossy black-cockatoo	Koala	Dunmall's snake	Squatter pigeon
Impact	Area (ha)	30.1	30.1	19.8	30.1	19.8	30.1
	Quality	6	5	5	4	6	5
Offset	Area (ha)	292.2	292.2	286.4	292.2	290.2	290.2
	Start quality	7	6	6	5	6	6
	Future quality without offset	7	6	6	5	6	6
	Future quality with offset	8	7	7	6	7	7
	Confidence in result (quality)	80%	80%	80%	80%	80%	80%
Risk of loss	Without offset	0.24%	0.24%	0.24%	0.24%	0.24%	0.24%
	With offset	0%	0%	0%	0%	0%	0%
	Confidence in result (risk)	80%	80%	80%	80%	80%	80%
Risk related time horizon/time over which loss is averted		20	20	20	20	20	20
Time until ecological benefit		20	20	20	20	20	20
% acquittal		**126.27%**	**151.17%**	**225.22%**	**154.56%**	**190.21%**	**150.16%**

Table 5.2: EPBC Act offsets assessment guide input justifications for each MNES

Input	Justification
Quality of impact area	The quality of the impact area for each MNES was calculated in accordance with the project specific MHQA method outlined in **Section 4** and **Appendix A**. The MHQA scoring was informed by the results of field surveys undertaken across the Development footprint in July 2025 (refer to **Section 2.3** and **Section 4** of the Offset Proposal). The modified MHQA-spreadsheet for each MNES, that accompanies this Offset Proposal, provides a comprehensive summary of the raw data collected and habitat quality score calculations in accordance with the project specific MHQA method. Each spreadsheet provides the habitat quality score calculations for the impact and offset area, including MNES specific scoring calculations.
Quality of offset area	The quality of the offset area for each MNES was calculated in accordance with the project specific MHQA method outlined in **Section 4** and **Appendix A**. The MHQA scoring was informed by the results of field surveys undertaken across the offset area in September 2025 and August 2026 (refer to **Section 3.3** and **Section 4)**. The modified MHQA-spreadsheet for each MNES, that accompanies this Offset Proposal, provides a comprehensive summary of the raw data collected and habitat quality score calculations in accordance with the project specific MHQA method. Each spreadsheet provides the habitat quality score calculations for the impact and offset area, including MNES specific scoring calculations.
Future quality without offset management	The property was originally purchased by Arrow CSG for the purpose of expanding their CSG development operations and they currently hold three Petroleum Leases (PL 305, 492 and 491) over Lots 31 and 32 AU60 to support future development. The future CSG development footprint as it currently stands is presented on **Figure 1.1**. While the development footprint and design of any future project infrastructure within Lots 31 and 32 AU60 are subject to change, Arrow CSG is committed to securing the proposed offset area and will ensure no future infrastructure is located within the offset area boundary. The offset area is intended to be legally secured through a suitable protective mechanism available to Arrow CSG under Queensland legislation. The legal protective mechanism will remain on title for at least the duration of the impact to preserve native vegetation within the offset area restricting the disturbance, degradation, removal or clearing of such vegetation in contravention with the OMP. This will also restrict the future use of land for any activities under existing and future production permits and any unrestricted clearing of vegetation within mapped Category X areas on the RVMM that comprise approximately 42% (127.8 ha) of the offset area (**Figure 3.5**). Following Arrow CSG's acquisition of the property, outside of any exploration and design works for the Project and future development, the property has been subject to livestock grazing under an agistment agreement. The property is also at risk of inappropriate fire regimes including unplanned, uncontrolled or catastrophic fire events. Given the significant damage caused by the recent bushfire in 2022-2023, further inappropriate fires could result in further degradation to habitat quality and availability to the MNES offset values. For the purpose of the offsets assessment guide it is assumed that the habitat quality scores will not change based on a business as usual scenario, without offset management, despite the current land use and proposed CSG development plans.
Future quality with offset management	The offset area will be legally secured, managed and monitored to improve the quality of habitat for each MNES. The future habitat quality scores form the completion criteria to be achieved through the implementation of the OMP. The OMP provides specific management actions aimed at improving the quality of habitat for each MNES and minimising the risk of

Input	Justification
	threatening processes occurring through the implementation of an adaptive management and monitoring program. The proposed management and monitoring program includes: • Upgrades to all fencing around and within the offset area to be fauna friendly to facilitate safe movement and dispersal opportunities between the offset property, Barakula State Forest and connected vegetation. • Upgrade and ongoing maintenance of the existing network of access tracks to provide safe vehicle access around the property as well as enforcing speed limits of <40km within the offset area to minimise the risk of fauna strike. • Implementation of a strategic fire management strategy to manage the risk of an unplanned, uncontrolled or catastrophic fire within the offset area. The strategic fire management strategy will involve a range of management activities including stakeholder engagement and communication, establishing and maintaining fire breaks and fire management lines, undertaking prescribed burns, weed control and other fuel load reduction techniques as required. Fire management will consider the species-specific requirements for the MNES as well measures to protect and provide safe refuge for species during implementation of controlled burns. Prescribed burns will require consideration of the vegetation composition and structure supporting MNES habitat, including their ability to recover after post-fire to continue supporting suitable habitat. • Active pest animal control will be implemented with the aim minimise the risk of predation within the offset area by feral cat, wild dog and fox; however, baseline scores are assumed to remain consistent over the management period and no conservation gain is proposed for this threat. • Active weed control to maintain and/reduce current weed cover and richness to support improvements in habitat quality and successful establishment of restoration plantings in regrowth and non-remnant areas. Active restoration of regrowth and non-remnant through targeted infill planting and revegetation, respectively, of tree, shrub and ground layer species to re-establish the vegetation communities in structure, composition, and diversity compared to that of the benchmark of the ground-truthed RE. Planting will prioritise species known to support and align with specific habitat requirements for the MNES offset values to enhance and improve the quality of habitat. As detailed in the OMP, targeted infill planting and revegetation will: • Be undertaken by a suitably qualified vegetation specialist. • Utilise locally sourced and grown native species prioritising species that are included in the RE description for each vegetation community and align with the habitat requirements of the MNES offset values. • Consist of a mix of trees, shrubs and ground cover species and will be carried out through a combination of direct seeding, broadcast seeding and establishment of a tube stock. • Meet specific planting densities and design to mimic natural conditions and align with the relevant RE benchmark and technical description. • Include the implementation of site and ground preparation works to ensure adequate soil moisture and control competition (weeds and browsing animals) prior to planting. • Include implementation of appropriate maintenance and monitoring events to ensure successful establishment of plantings progression towards the achievement of the site and species-specific attribute targets and completion criteria • Include remedial plantings will be undertaken should the density and composition of species no longer meet the performance criteria

Input	Justification
	A comprehensive monitoring program will be implemented to assess the effectiveness of the management and successful establishment of the plantings as well as progress of the offset area in achieving the required outcomes and completion criteria. The monitoring program will include ongoing activities such as offset area inspections, biomass and fuel load monitoring, weed and pest animal monitoring, habitat quality assessments and targeted fauna surveys and restoration planting inspections.
Confidence in result (quality)	The OMP has been prepared based on the outcomes of detailed field assessments to assess the current condition state and threatening processes evident within the offset area related to the habitat for each MNES. This has included baseline weed and pest surveys. Subsequently the OMP was developed to align with the relevant published recovery plans, threat abatement plans and approved conservation advice for each MNES to ensure the proposed management and monitoring activities are aimed at improving the quality of MNES habitat within the offset area. A comprehensive monitoring program will be undertaken throughout the implementation of the OMP to assess the effectiveness of the management actions and progress towards achieving the required interim milestones and completion criteria for each MNES. Specific triggers have been developed to assess the effectiveness of the proposed management actions and success of the restoration plantings, with corrective actions to be implemented in instances of non-compliance or lack of progressions towards the site and species-specific attribute targets, the interim milestones and completion criteria. In consideration of the adaptive management process the OMP has been prepared to provide an efficient, effective, timely, transparent, scientifically robust and reasonable approach to the management of the offset area.
Risk of loss without offset	Risk of loss without the offset is 0.24% based on the average annual background rate of loss outlined in *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al, 2017) for the Western Downs Regional Council area.
Risk of loss with offset	The risk of loss with the offset is 0%. The offset area will be legally secured through a suitable protective mechanism available to Arrow CSG under Queensland legislation. The legal protective mechanism will remain on title for at least the duration of the impact to preserve native vegetation within the offset area restricting the disturbance, degradation, removal or clearing of such vegetation in contravention with the OMP. This will also restrict the future use of land for any activities under existing and future production permits and any unrestricted clearing of vegetation within mapped Category X areas on the RVMM that comprise approximately 42% (127.8 ha) of the offset area.
Confidence in result (risk of loss)	The protective mechanism will be registered on title for at least the duration of the impact and will bind all current and future landholders to ensure the offset area is protected and maintained.
Risk related time horizon/time over which loss is averted	The offset area will be protected for at least the duration of the impact with the OMP remaining in place until the completion criteria are achieved, therefore the maximum allowable time of 20 years has been considered.
Time until ecological benefit	Through the implementation of the OMP including the proposed management actions to improve the quality of habitat for MNES and reduce the relevant threatening processes, the proposed ecological benefit for each MNES is anticipated to be realised in 20 years.

5.2 EPBC Act Offset Policy

In accordance with the EPBC Environmental Offset Policy (DSEWPC 2012), there are eight offset principles that all EPBC Act offsets must meet. A summary of these principles and how the proposed offset area meets these requirements is provided in **Table 5.3**.

Table 5.3: EPBC Act Environmental Offset Policy principles

Offset Principle	Project Compliance
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the proposed action	Security of the proposed offset area will contribute to the ongoing viability of the MNES offset values through the legal protection of habitat from future loss and fragmentation and the improvement in the quality and connectivity of suitable habitat for Corben's long-eared bat, diamond firetail, glossy black-cockatoo, koala, Dunmall's snake and squatter pigeon. An OMP (**Section 6.1**) has been developed, in conjunction with this offset proposal, to provide a practical document to guide the management, monitoring and reporting activities at the offset area to deliver an overall conservation outcome that improves the viability of habitat for Corben's long eared bat, diamond firetail, south-eastern long eared bat, koala, Dunmall's snake and squatter pigeon. The OMP includes specific offset area outcomes, including interim milestones and completion criteria relevant to each MNES. These outcomes will be achieved over a 20-year period through the implementation of a range of management and monitoring actions that are aligned with the conservation initiatives most relevant to each MNES as well as the offset area threats identified through baseline surveys. These outcomes will be achieved over a 20-year period through the implementation of a range of management and monitoring actions that are aligned with the conservation initiatives most relevant to each MNES as well as the offset area threats identified through baseline surveys. The key activities include: • Upgrades to all fencing around and within the offset area to be fauna friendly to facilitate safe movement and dispersal opportunities between the offset property, Barakula State Forest and connected vegetation. • Upgrade and ongoing maintenance of the existing network of access tracks to provide safe vehicle access around the property as well as enforcing speed limits of <40km within the offset area to minimise the risk of fauna strike. • Implementation of a strategic fire management strategy to manage the risk of an unplanned, uncontrolled or catastrophic fire within the offset area. The strategic fire management strategy will involve a range of management activities including stakeholder engagement and communication, establishing and maintaining fire breaks and fire management lines, undertaking prescribed burns, weed control and other fuel load reduction techniques as required. Fire management will consider the species-specific requirements for the MNES as well measures to protect and provide safe refuge for species during implementation of controlled burns. Prescribed burns will require consideration of the vegetation composition and structure supporting MNES habitat, including their ability to recover after post-fire to continue supporting suitable habitat.

Offset Principle	Project Compliance
	• Active pest animal control to minimise the risk of predation of on MNES within the offset area, as well as reduce any potential habitat degradation associated with feral pig activity. • Active weed control to maintain and/reduce current weed cover and richness to support improvements in habitat quality and natural regeneration in regrowth and non-remnant areas. • Active restoration of regrowth and non-remnant through targeted infill planting and revegetation, respectively, of tree, shrub and ground layer species to re-establish the vegetation communities in structure, composition, and diversity compared to that of the benchmark of the ground-truthed RE. The offset area will be legally secured to ensure all native vegetation within the offset area is preserved, imposing an obligation to not disturb, degrade, remove or clear such vegetation, ensuring the long term protection of MNES habitat (**Section6.3).** Without the offset being put in place, key threatening processes would prevail including: • Loss, clearing and fragmentation of habitat through unrestricted clearing within Category X areas of the property and future development of the offset property for resources. • Degradation of MNES habitat through inappropriate fire management and/or catastrophic fire event.
Be built around direct offsets by may include other compensatory measures	The Project's MNES offset requirements will be acquit through the delivery of direct land-based offsets on the Girrahween Station property offset area.
Be in proportion to the level of statutory protection that applies to the protected matter	The threatened status of the protected matter is considered as part of the offsets assessment guide when calculating the quantum of offset area required to be secured for MNES offset requirement.
Be of a size and scale proportionate to the residual impacts on the protected matter(s)	The size of the area for each MNES has been calculated in accordance with the offsets assessment guide which requires specific inputs related to both the impact and offset area to ensure the size and scale of the offset area is proportionate. Detailed field surveys and assessments of both the impact and offset area have been undertaken as part of preparation of this offset proposal (**Section 2.3** and **Section 3.3**) to support the provided inputs and justifications in the offsets assessment guides (see **Section 5.1**). A project-specific MHQA method (see **Appendix A**) was developed to ensure a consistent and rigorous approach to the assessment of habitat quality scores for MNES values at the impact and offset area. This included the quantification of the baseline habitat quality and the future habitat quality score with offset management for each MNES offset requirement. The resulting habitat quality scores were subsequently used as part of offsets assessment guide calculations to determine the size and scale requirements for the proposed offset area. The modified MHQA-spreadsheet for each MNES, that accompany this Offset Proposal, provide a comprehensive summary of the raw data collected and habitat quality score calculations in accordance with the project specific MHQA method. Each spreadsheet provides the habitat quality score calculations for

Offset Principle	Project Compliance
	the impact and offset area, including MNES specific scoring calculations, as well as the projected future habitat quality scores included in the offsets assessment guides.
Effectively account for and manage the risks of the offset not succeeding	An OMP (**Section 6.1**) for the proposed offset has been developed in consideration of known and potential threats to the MNES offset values to manage the risk of the offset failing to achieve the conservation outcomes required. The relevant site-specific risks and threats to the MNES offset values were identified as part of detailed field surveys and a review of current literature (e.g. conservation advice, recovery plans) including: • loss, clearing and fragmentation of reducing foraging, roosting, breeding and dispersal habitat, • inappropriate fire regimes, • habitat degradation caused by an overabundance and/or inappropriate pastoral grazing, • habitat degradation associated with an overabundance of weed cover and species, • direct mortality from pest species (e.g. feral cat, feral pig feral, wild dog, fox), • habitat degradation caused by pest species (e.g rabbits), and • fatalities cause by vehicle interactions. Confidence in the success of the offset achieving the required habitat quality gains is high as it relies on the implementation of management actions that are easily controlled and adapted to ensure they are effective to accomplish the desired outcome. The OMP will be implemented based on an adaptive management approach, which has been informed by a detailed risk assessment evaluating the consequence and likelihood of the identified threats both with and without implementation of the proposed management actions. The adaptive management process manages uncertainty and the risk of the offset failing to achieve an overall conservation outcome that improves or maintains the viability of the MNES offset values. This includes the identification of suitable management actions, and monitoring program as well as adaptive management triggers and corrective actions relevant to the offset area and the threats to the MNES offset values. In relation to the targeted infill planting and revegetation proposed to be undertaken within regrowth and non-remnant areas of the offset area, specific corrective actions have been included as part of the OMP and will be implemented should these areas fail to achieve the required outcomes. This includes but is not limited to supplementary/remedial plantings should the sites fail to achieve the site and species-specific attribute targets and interim milestones and completion criteria and/or no longer reflect the structure and composition of the relevant local vegetation community or communities.
Be additional to what is already required, determined by law or planning regulations or agreed to under schemes or programs (this does not preclude the recognition of	The management outcomes and completion criteria relevant to each MNES, proposed to be achieved through the implementation of a site-specific management and monitoring program, is additional to the actions currently undertaken on a business-as-usual case. While the Girrahween Station property was acquired by Arrow CSG for the purpose of developing its SGP North gasfields, Arrow CSG recognises the

Offset Principle	Project Compliance
state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see section 7.6 of the policy)	significant ecological values of the property and has committed to securing an offset area on the property excluding all future development, to ensure the long term conservation of the offset area and its MNES habitat values. The offset area will be legally secured on title prior to the commencement of the action. The legal protective mechanism will remain on title for at least the duration of the impact to preserve native vegetation within the offset area restricting the disturbance, degradation, removal or clearing of such vegetation in contravention with the OMP, ensuring the long term protection of the MNES habitat values. This is additional to the level of protection provided under existing laws. Through the implementation of the OMP (**Section 6.1**) additional activities will be undertaken to those required under a business as usual case. These include: • Weed and pest animal management additional to that required of a landholder under the *Biosecurity Act 2014* (Qld) to take all reasonable and practical steps to manage each biosecurity risk. • Implementation of a strategic fire management strategy including establishment and regular maintenance of firebreaks, active management of fuel loads and fuel hazard reduction burns. • Exclusion of grazing. • Ongoing ecological monitoring obligations to ensure the conservation outcomes are being achieved. • Ongoing reporting obligations to assess the success of achieving the conservation outcomes.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	**Efficient and effective** The offset area is strategically located within a State significant biodiversity corridor and connected through contiguous remnant vegetation to Barakula State Forest. Establishment of an offset area here will increase habitat availability and patch size of suitable habitat for the MNES offset values, as well as facilitate the safe movement of local populations between the offset property, Barakula State Forest and connected vegetation. The proposed management and monitoring program will be developed to ensure efficient and effective delivery of the required outcomes and habitat quality gains. Implementation of an adaptive management process will ensure management actions are effective in achieving the required outcomes. **Timely** It is anticipated that the full habitat quality gains will be achieved within 20 years. The OMP will specify time bound interim milestones to be achieved at defined time intervals over the management period to ensure the offset area is tracking towards the required completion criteria. The offset area will be legally secured prior to the commencement of the Project. **Transparent** As part of the OMP a report detailing the progress of the offset area in achieving the offset area outcomes will be prepared annually and submitted to the Commonwealth Government by each anniversary of the approval of the OMP until the completion criteria are achieved. The OMP will be reviewed as part of the progress report, and updated as required, to ensure the relevant management and monitoring programs remain current and effective in

Offset Principle	Project Compliance
	accordance with the adaptive management framework and are informed by up-to-date best practice information and species-specific conservation advice. **Scientifically robust** Baseline surveys and offset property assessments have been undertaken by suitably qualified and experienced ecologists, using agreed survey methods and guidelines endorsed by NEPA. Ongoing management and monitoring actions will be undertaken by qualified ecologists and regeneration specialists to achieve the outcomes to be specified in the OMP. Suitably qualified contractors will undertake restoration planting and management actions such as weed control, fire management and pest animal control.
Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The OMP (**Section 6.1**) includes a comprehensive monitoring program to be undertaken throughout the management period to assess the effectiveness of the management actions and progress of the offset area in achieving the outcomes for each MNES offset value. A project specific MHQA method has been prepared (**Appendix A**) to provide clear guidance on the method required to derive habitat quality scores, ensuring there is a repeatable process to assess progress over time. Regular reports will be prepared throughout the management period to document the outcomes of the management and monitoring program, and progress towards the offset area outcomes. Reports will be submitted to NEPA for review and assessment against the requirements of the OMP.

5.3 Comparison with impact area

The EPBC Act Environmental Offsets Policy requires offsets to deliver an overall conservation outcome that improves or maintains the viability of the aspect of the MNES being impacted by the Project by protecting the same or similar ecological values as those being impacted (i.e. like-for-like).

The proposed offset area has been strategically located on Girrahween Station, approximately 4 km east of the Development footprint, with the two sites connected through tracts of contiguous remnant vegetation surrounding the property including Barakula State Forest. A comparison of vegetation and habitat values being impacted and those being managed and protected as part of the offset area is provided in **Table 5.4**.

Table 5.4: Summary of the habitat values and associated threats at the impact and offset areas

MNES	Impact area	Offset area
Corben's long eared bat	The Project will impact on 30.1 ha of suitable foraging habitat for the species including 19.8 ha of suitable roosting habitat. Regrowth RE 11.5.1 is considered to provide suitable foraging and roosting habitat for this species, noting that habitat assessments undertaken across the Development footprint identified very few large trees capable of supporting hollows; however, there was an abundance of decorticating bark present within the	Considering the wide range of woodland habitats that this species is capable of utilising, the entire offset area (302.9 ha) is mapped as suitable habitat for this species comprising RE 11.3.4, 11.3.14, 11.3.27f, 11.3.25, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7. An abundance of decorticating bark and tree hollows for this species to utilise as roosting locations were observed in the offset area with surrounding, adjacent areas supporting suitable woodland vegetation in which they can forage.

MNES	Impact area	Offset area
	Development footprint, which this species can also utilise as roosting habitat. The remaining non-remnant areas have the potential to support foraging opportunities for populations residing in the adjacent roosting habitat. No individuals have been recorded within the Development footprint, although several records of Corben's long-eared bat have been identified in the region surrounding the Development footprint (including Barakula State Forest and Condamine State Forest) with the nearest record is approximately 0.5 km to the south-east (Arrow CSG 2013; **Figure 3.3**). Vegetation within the Development footprint is currently grazed and is recovering from a 2022-2023 bushfire. The impact habitat quality score for the species is 6/10.	Similar to the Development footprint, no individuals have been recorded within this area, with the nearest record the same as for the Project approximately 0.5 km to the west from 2013 (ALA 2025; **Figure 3.3**). The offset property is strategically connected to Barakula State Forest through contiguous remnant vegetation to the north and is largely surrounded by areas of mapped remnant vegetation supporting connectivity between potential habitat and local populations. Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Management of the offset area will focus on the protection of the offset area from future unplanned bushfire events, and excluding grazing to avoid ongoing degradation. Revegetation of non-remnant areas and infill planting within regrowth areas will prioritise species that provide habitat for Corben's long eared bat to actively support restoration and habitat creation across the offset area. The start offset area habitat quality score for the species is 7/10.

MNES	Impact area	Offset area
Diamond firetail	The Project will impact 30.1 ha of suitable foraging habitat for this species. Considering the broad range of woodland vegetation types this species can utilise, the entire Development footprint is considered to support suitable for the species comprising regrowth 11.5.1 and non-remnant areas. No individuals were observed during survey efforts across the Development footprint; however, there are several records of the species in the region surrounding the Development footprint (including Gurulmundi State Forest, Barakula State Forest and Condamine State Forest), with the nearest record ~23 km to the north-west from 2019 (ALA 2025; **Figure 3.3**). Within the Development footprint habitat degradation associated with recent bushfires, livestock grazing as well as the presence of various pest and weed species is likely to impact the condition of habitat for the species, given their preference for habitat supporting low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding. The impact habitat quality score for the species is 5/10.	Due to the wide range of habitats that this species is capable of utilising, the entire offset area (302.9 ha) is mapped as suitable habitat for this species comprising RE 11.3.4, 11.3.14, 11.3.27f, 11.3.25, 11.5.1, 11.5.4, 11.5.20, 11.5.21, 11.7.7. While no species have been recorded within the offset area, numerous historical records have been identified in the region with the nearest record ~ 26 km to the north-west as well as several grided records throughout Barakula State Forest from 2019 (ALA 2025; **Figure 3.3**). Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Additionally, the offset area is currently grazed with evidence of various pest and weed species recorded during baseline surveys. Management of the offset area will focus on the protection of the offset area from future unplanned bushfire events, excluding grazing to avoid ongoing degradation, and active weed pest animal control. Revegetation of non-remnant areas and infill planting within regrowth areas will prioritise species that provide habitat for Diamond firetail to actively support restoration and habitat creation across the offset area. The start offset area habitat quality score for the species is 6/10.
South-eastern glossy black-cockatoo	The Project will impact 19.8 ha of suitable foraging habitat for the species. Areas of regrowth RE 11.5.1 are considered to support foraging habitat for the species based on the presence of *Allocasuarina luehmannii* (buloke). While not listed as a preferred feed tree species *A. luehmannii* is thought to be an occasional food source in inland NSW and may be used in some years. The Development footprint is unlikely to contain any suitable roosting habitat for this species due to the lack of mature vegetation and permanent water resources. No individuals were observed during consolidated survey efforts within the Development footprint with the nearest record is approximately 2 km to the south-east (Arrow CSG 2013; **Figure 3.3**).	Due to this species reliance on vegetation that supports either foraging and/or roosting opportunities, most but not all the offset area has been identified as suitable habitat for this species. A total of 286.4 ha of suitable habitat has been mapped for this species (excluding remnant 11.3.27f and non-remnant 11.5.21 communities). An abundance of *Allocasuarina luehmannii* (buloke; listed as an occasional food resource), was observed recovering within both remnant and regrowth communities and are likely to provide foraging resources for any locally occurring populations. Mature, hollow bearing trees were also identified in remnant vegetation along to Bottle Tree creek that could be utilised as roosting habitat for the species. While no species have been recorded within the offset area, several historical records have been identified in the surrounding region, the nearest of which being approximately 1.5 km to the south-west as well as numerous records

MNES	Impact area	Offset area
	Vegetation within the Development footprint is currently grazed and is recovering from a 2022-2023 bushfire. The impact habitat quality score for the species is 5/10.	throughout Barakula State Forest (Arrow CSG 2013; **Figure 3.3)**. Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Additionally, the offset area is currently grazed with evidence of various pest and weed species recorded during baseline surveys. Management of the offset area will focus on the protection and enhancement of habitat for the species in the offset area through protection from future unplanned bushfire events, excluding grazing to avoid ongoing degradation, active weed control, and minimising the risk of predation from pest animals (particularly feral cats and foxes). Revegetation of non-remnant areas and infill planting within regrowth areas will prioritise the planting of species (e.g. *Allocasuarina luehmannii)* to actively restore and create additional foraging resources and shelter habitat for this species to utilise. The start habitat quality score for the species is 6/10.
Koala	The Project will impact on 19.8 ha of breeding and foraging and 10.3 ha of dispersal habitat for koala, totalling 30.1 ha. Areas of regrowth RE 11.5.1 are considered likely to provide suitable breeding and foraging opportunities for koala based on the presence of LIKT species including: • *Eucalyptus crebra* • *Eucalyptus populnea* • *Eucalyptus exserta* • *Eucalyptus fibrosa* Adjacent non-remnant areas are likely to facilitate dispersal of any locally occurring koala populations. No evidence of koalas was observed within the Development footprint, although there are numerous records in the region surrounding the Development footprint, with the nearest record being 9 km to the south-east from 1987 and 26 km to the north-east from 2017 (ALA 2025; **Figure 3.3**). Vegetation within the Development footprint has been heavily impacted by historical clearing and recent fire. While the	All remnant and regrowth vegetation (290.2 ha; RE 11.3.4, 11.3.14, 11.3.25, 11.3.27f, 11.5.1, 11.5.4, 11.5.20, 11.7.7) within the offset area supports suitable breeding and foraging habitat for koala with all non-remnant (11.5.21) areas mapped as suitable dispersal habitat (~2 ha). Koala LIKT species observed across the offset area include: • *Eucalyptus chloroclada* • *Eucalyptus crebra* • *Eucalyptus exserta* • *Eucalyptus fibrosa* • *Eucalyptus longirostrata* • *Eucalyptus moluccana* • *Eucalyptus populnea* No koalas have been recorded within the offset area; however, there are several historical and modern records in the surrounding region throughout Barakula State Forest and in areas south of Miles, Qld, the nearest modern record being approximately 19 km to the north-east from 2017 (ALA 2025; **Figure 3.3**). Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween

MNES	Impact area	Offset area
	presence of LIKT represents a potential foraging resource, the nature of the Development footprint and recent fire damage means it is unlikely to represent habitat used during periods of drought and fire (though this could be subject to change over time). The impact habitat quality score for the species is 5/10.	Station property and the surrounding area in 2022-2023. In addition, the offset area is currently grazed with evidence of various pest and weed species recorded during baseline surveys. Management of the offset area will focus on the protection and enhancement of habitat for the species in the offset area through protection from future unplanned bushfire events, excluding grazing to avoid ongoing degradation, active weed control, minimising the risk of predation from pest animals (particularly dogs and feral cats) and from fatalities caused by vehicle strike. Revegetation of non-remnant areas and infill planting within regrowth areas will prioritise the planting of species (e.g. LIKT and AHT) to enhance breeding, foraging and shelter for this species to utilise. The start offset area habitat quality score for the species is 5/10.
Dunmall's snake	The Project will impact 19.8 ha of suitable foraging habitat for the species. Areas of regrowth RE 11.5.1 are considered to support suitable habitat for the species including the confirmed presence of suitable microhabitat features the species is known to require such as small-medium sized coarse woody debris, soil cracks and termite mounds. Dunmall's snake is very rarely encountered, even in areas of known habitat (Wilson 2022), with the nearest record approximately 7 km to the north-west of the Development footprint (Arrow CSG 2022). Vegetation within the Development footprint is currently grazed and is recovering from a 2022-2023 bushfire. The impact habitat quality score for the species is 6/10.	All remnant and regrowth vegetation within the offset area (290.2 ha) has been mapped as suitable habitat for the species. The offset area is dominated by a mixture of *Eucalyptus* and *Corymbia* vegetation communities supporting suitable microhabitat features required by Dunmalll's snake including fallen timber and ground litter. While no Dunmall's snakes have been recorded within the offset area, the nearest record is approximately 8km to the north-west of the offset, connected to the offset area via contiguous vegetation through a tributary of Bottle Tree Creek (**Figure 3.3**). Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Additionally, the offset area is currently grazed with evidence of various pest and weed species recorded during baseline surveys. Management of the offset area will focus on the protection of the offset area from future unplanned bushfire events, excluding grazing to avoid ongoing degradation, and active weed and pest control. Targeted infill planting within regrowth areas will prioritise planting of tree, shrub and ground layer species to re-establish the vegetation communities in structure, composition to enhance and improve the quality of habitat for Dunamall's snake.

MNES	Impact area	Offset area
		The start offset area habitat quality score for the species is 6/10.
Squatter pigeon	The Project will impact 30.1 ha of suitable foraging habitat for the species. The entire Development footprint is likely to contain suitable foraging habitat for this species, given its located within 1.5 km of permanent water (a farm dam to the north west of the Project). Several squatter pigeon records have been identified in the region surrounding the Project area (including Binkey State Forest, Cherwondah State Forest and Barakula State Forest). No individuals have been observed during consolidated survey efforts with the nearest record approximately 10 km to the west of the Development footprint (Arrow 2019). Vegetation within the Development footprint is currently grazed and is recovering from a 2022-2023 bushfire. The impact habitat quality score for the species is 5/10.	All remnant and regrowth vegetation communities (290.2 ha) are considered to support foraging habitat for squatter pigeon with multiple permanent water sources within approximately 1.7km of the offset area. The offset area is dominated by a mixture of *Eucalyptus* and *Corymbia* vegetation communities, including the presence of suitable ground cover and native grass species to support foraging and shelter habitat for the species. Most of the offset area was degraded by a recent bushfire that severely impacted the Girrahween Station property and the surrounding area in 2022-2023 (**Figure 3.2**). Despite this recent disturbance, an abundance of native grasses and shrubs were observed during surveys across this area, indicating that these resources have recovered well post fire and likely provide suitable foraging resources for any locally occurring squatter pigeon populations. Management of the offset area will focus on the protection of the offset area from future unplanned bushfire events, excluding grazing to avoid ongoing degradation and active weed and pest animal control. Targeted infill planting within regrowth areas will prioritise planting of tree, shrub and ground layer species to re-establish the vegetation communities in structure, composition to enhance and improve the quality of habitat for squatter pigeon. The start offset area habitat quality score for the species is 6/10.

6. Offset Implementation and Management

6.1 Offset management plan

An OMP has been developed, in conjunction with this offset proposal, to provide a practical document to guide the management, monitoring and reporting activities at the offset area and to deliver an overall conservation outcome that improves the viability of habitat for Corben's long eared bat, diamond firetail, south-eastern long eared bat, koala, Dunmall's snake and squatter pigeon. The OMP addresses the relevant requirements of Section 6 and Attachment B of the RFI. The OMP will be implemented following its approval by NEPA.

The OMP will be implemented based on an adaptive management process to ensure the conservation outcomes are achieved. This involves an iterative approach of learning and adapting the proposed plan to facilitate improved management and decision-making over time in response to evolving knowledge, changing circumstances and uncertainty.

A conservation outcome for each MNES will be achieved through the improvement in habitat quality scores over the life of the offset. The habitat quality scores, used to inform input into the offsets assessment guide, form the basis for the interim milestones and completion criteria to be achieved over the proposed 20-year management period through the implementation of the OMP (**Table 6.1**).

Table 6.1: Interim milestones and completion criteria

MNES	Start offset area HQ score	Offset Area Interim Milestones			Completion Criteria
	Baseline	Year 5	Year 10	Year 15	Year 20
Corben's long eared bat	6.61 (7)	7.02	7.42	7.83	8.23 (8)
Diamond firetail	5.73 (6)	6.05	6.37	6.68	7.00 (7)
South-eastern glossy black-cockatoo	6.07 (6)	6.41	6.75	7.08	7.42 (7)
Koala	4.92 (5)	5.28	5.64	5.99	6.35 (6)
Dunmall's snake	6.49 (6)	6.70	6.91	7.12	7.33 (7)
Squatter pigeon	6.16 (6)	6.45	6.73	7.02	7.30 (7)

Through the adaptive management process management actions will be implemented to minimise the risk of the known and potential threats to the MNES offset values and the offset area, and to ensure the offset area can achieve its completion criteria and conservation outcomes. The management program has been developed based on the recommended recovery and management actions outlined in approved conservation advice, recovery plans and threat abatement plans as well as the condition of MNES habitat assessed as part of the baseline survey program.

A summary of the identified and known threats to the MNES offset values, and how delivery of the proposed offset will manage these threats and meet the conservation priorities for the species, is provided in **Table 6.2**.

A summary of the proposed management, monitoring and reporting program required to ensure the conservation gains are achieved for the offset area is described in **Table 6.3** below with further detail provided in the OMP.

Table 6.2: Relevant conservation priorities and management activities to be undertaken

MNES known and potential threats	Management activity					
	Legal security	Fencing, livestock exclusion & access	Fire management	Weed management	Pest management	Restoration planting
Corben's long eared bat (TSSC, 2015)						
Loss of habitat, habitat fragmentation and a reduction in hollow availability through land clearing	✓					✓
Alteration to the structure of suitable habitat and roosting sites, including loss of hollow bearing trees through inappropriate fire regimes			✓			✓
Alteration to the structure and diversity of habitat through inappropriate grazing regimes, as well as a reduction in shrubs and understory habitat.		✓				✓
Diamond firetail (DCCEEW, 2023)						
Loss of habitat and fragmentation through land clearing	✓					✓
Alterations to the floristic and structural characteristics of habitat and food availability through invasive weed incursion, particularly exotic annual grasses				✓		✓
Alteration to the structure and diversity of habitat through inappropriate grazing regimes		✓				✓
Changes in composition and/or structure of vegetation and habitat through inappropriate fire regimes			✓			✓
South eastern glossy black cockatoo (DCCEEW, 2022)						
Loss of habitat (including feeding and hollow bearing trees) and fragmentation through land clearing	✓					✓

MNES known and potential threats	Management activity					
	Legal security	Fencing, livestock exclusion & access	Fire management	Weed management	Pest management	Restoration planting
Alteration of habitat impacting the quality of feeding and breeding habitats as a result of inappropriate fire regimes			✓			✓
Alteration to the structure and diversity of habitat through inappropriate grazing regimes		✓				✓
Predation by feral animals (e.g cats and foxes)					✓	
Koala (DAWE, 2022a, b)						
Loss of habitat and fragmentation through land clearing	✓					✓
Alteration of habitat, including the loss of food and shelter trees, as a result of inappropriate fire regimes			✓			✓
Predation by feral animals (e.g wild dogs and feral cats)					✓	
Direct mortality from vehicle strike		✓				
Dunmall's snake (DoE 2014; DCCEEW 2026)						
Habitat loss and fragmentation caused by land clearing	✓					✓
Habitat degradation associated with overgrazing by livestock		✓				✓
Predation by feral animals (e.g. feral cat)					✓	
Inappropriate fire regimes resulting in a loss of fallen timber and ground litter			✓			✓
Invasion of weeds				✓		✓
Squatter pigeon (TSSC 2015b; DoE 2026b, DCCEEW 2024)						
Habitat loss caused by land clearing	✓					✓
Invasive weeds (especially buffel grass)				✓		✓

MNES known and potential threats	Management activity					
	Legal security	Fencing, livestock exclusion & access	Fire management	Weed management	Pest management	Restoration planting
Habitat degradation caused by livestock grazing		✓				✓
Inappropriate fire regimes			✓			✓
Predation by feral cats, European red foxes and feral dogs					✓	

Table 6.3: Proposed management, monitoring and reporting program for the offset area

Action	Outcome
Management	
Vegetation clearing	Clearing of native vegetation will not be permitted in the offset area except as part of necessary management and monitoring activities under the OMP including but not limited to: • Maintenance of access tracks and fire breaks • Management of fuel loads • Fence construction and maintenance • Ensuring public safety or as directed by emergency response personnel in the event of an unplanned fire or other emergency. Any permitted vegetation clearing activities must be appropriately planned, recorded and monitored. Legal security of the offset area on title will restrict the allowable land use activities on the offset area, imposing an obligation to not disturb, degrade, remove or clear such vegetation in contravention with the OMP that would result in the loss of the MNES offset values.
Unauthorised access or use	• Signs will be installed at access locations noting the area is protected for conservation purposes and restricting access to authorised personnel only. • The offset area will be suitably fenced to restrict access. Vehicles permitted into the offset area must travel to track conditions, adhering to a maximum speed limit of 40km/h, to minimise risk of vehicle strike to fauna (e.g. koala) and maintain safety of personnel.
Livestock	Grazing will be excluded at all times.
Fencing and access track installation and upgrades	Fencing will be installed around the boundary of the offset area in the first year of management to exclude livestock and manage unauthorised access. New and existing fencing will be upgraded and installed to meet the requirements of the Queensland Government's *Koala-Sensitive Design Guideline - A guide to koala-sensitive design measures for planning and development activities*[2] (DES 2022) to facilitate the safe movement of fauna between the offset area and adjacent suitable habitat.
Fire management	A strategic fire management strategy will be implemented to manage the risk of an unplanned, uncontrolled or catastrophic fire within the offset area and assist in improving habitat quality. The risk of an unplanned fire event in the offset area will be managed through: • Engagement with key stakeholders for fire management including offset property landholders, neighbours, competent fire practitioners, local rural fire brigade and offset area contractors and managers. • Establishment and regular maintenance of firebreaks to protect the offset area from an uncontrolled fire. • Management of fuel loads through weed control and prescribed burns. • Implementation of a site-specific Prescribed Burn Strategy. The strategy will consider the species-specific requirements for the MNES offset values as well measures to protect and provide safe refuge for any species on the property at the time of a prescribed burn. The prescribed burn strategy will be developed and continually reviewed throughout the offset management period, to consider the latest research on MNES offset values and the effects of fire.

[2] www.detsi.qld.gov.au/_global/policy-register/policy-register-pdf?getdoc=5154&name=koala-sensitive-design-guideline.pdf

Action	Outcome
Pest animal management	Managing invasive species requires a co-ordinated, landscape-level approach and pest animal numbers are likely to fluctuate over the life of the offset due to factors beyond Arrow CSG's control. Consequently, whilst pest animal control will be implemented within the offset area in accordance with the *Biosecurity Act 2014* (Qld), baseline scores are assumed to remain consistent over the management period and no conservation gain is proposed for this threat. Management approaches will follow best practice guidance published by Biosecurity Queensland, Department of Primary Industries, and utilise evidence-based control techniques for priority species. Priority species for management include those identified as known threats to the MNES in the Project's MHQA method, namely, feral cats, dogs and foxes
Weed management	Weed management within the offset area will follow best practice integrated weed management (IWM) for natural ecosystems which combines multiple strategies to effectively control weeds to achieve long-term weed control to support ecosystem stability and restoration and improve or maintain habitat quality for relevant MNES. Baseline weed cover surveys undertaken in September 2025 and August 2026 indicate the presence of 11 non-native species within the offset area. Although weed cover across the offset area is generally low, weed control in areas where the baseline total weed cover score was greater than 4% will be prioritised in the first 2 years of management. Priority areas for management in years 1 and 2 total 63.4 ha in size and are associated with riparian vegetation directly adjacent to Bottle Tree Creek with a focus on the following prohibited and restricted matters listed under the *Biosecurity Act 2014* (Qld), Weeds of National Significance (WONS), or commonly observed species with the highest total weed cover scores: • *Glandularia aristigera* (Moss verbena) • *Megathyrsus maximus* (Guinea grass) • *Melinis repens* (Natal grass) • *Oxalis corniculata* (Creeping woodsorrel) Weed control techniques will be species dependent and may include physical, mechanical, chemical, fire or biological techniques. Priority areas for control will be reviewed following the year 2 weed monitoring. Active weed control will aim to reduce the current weed cover and richness and ensure there are no new weed infestations established within the offset area to support improvements in habitat quality and recruitment/natural regeneration.
Restoration planting	Targeted infill planting and broadscale revegetation will be undertaken within areas of regrowth (84.8 ha) and non-remnant vegetation (2.0 ha) to actively support restoration and habitat creation to achieve the offset area completion criteria. Targeted infill planting and revegetation will be undertaken utilising locally sourced and grown native species with the aim to re-establish the vegetation communities in structure, composition, and diversity compared to that of the benchmark of the ground-truthed RE for each assessment unit. Plantings will consist of a mix of trees, shrubs and ground cover species and will be carried out through the establishment of a tube stock and supplemented with direct and/or broadcast seeding. Species will be selected to align with the ground-truthed RE for the relevant assessment unit and will prioritise species known to support and align with specific habitat requirements for the MNES offset values. Within regrowth areas (management zone 2), targeted infill planting is proposed to enhance the existing structure, composition and diversity of tree, shrub and ground cover species. Stem density assessments will be undertaken in the regrowth RE 11.5.1 and regrowth RE 11.5.4

Action	Outcome
	assessment units, prior to planting, to establish the baseline density of trees, shrubs and ground cover species and inform the required number of species to be planted. Within non-remnant areas (management zone 3), revegetation will be designed so that tree and shrub plantings are no more than 5 m apart, measured from stem-stem and a minimum stocking density of at least 400 stems per hectare is established. Groundcover species are not included in stem counts; however, should be planted based on the suggested spacings provided above and to align with the species composition, structure and diversity of a the RE benchmark. Regular maintenance and monitoring will be undertaken to ensure plant establishment is successful, with mortalities appropriately rectified to ensure the achievement of the respective RE density and species composition.
Monitoring	
Offset area inspections	Offset area inspections will be undertaken at least annually to provide a general assessment of the offset area and identify any risks that may require action to be undertaken. Offset area inspections will assess the following, at a minimum: • condition of fencing, gates, signs, access tracks and firebreaks, • compliance with restrictions for vegetation clearing associated with maintenance and establishment of access tracks, fencing and firebreaks, • evidence of damage associated with pest animal activity, • evidence of unauthorised access, • incidental observations and location of weed and non-native species particularly within high trafficable areas (e.g. entry gates, creek crossings, stock watering points) to monitor potential introduction and/or irruptions, • incidental fauna observations, and • any additional risks to offset values not currently being managed.
Biomass and fuel load monitoring	Biomass monitoring for fuel load and fire management will be undertaken throughout the management period at the end of the wet season to inform fuel load management requirements for the upcoming dry season, considering biomass is greatest at the end of wet season with fire risk being the highest during the dry season. Biomass will be assessed using the pasture photo standards[3] to determine the estimated dry matter yield (kg/ha of groundcover). Fuel load monitoring will be undertaken in accordance with the Overall Fuel Hazard Assessment Guide[4] (Hines et al. 2010).
Weed and pest animal monitoring	Weed and pest animal monitoring will be undertaken throughout the management period to inform the timing and location of weed and pest animal control activities. The monitoring programs will be based on the methods used as part of the baseline surveys (see **Section 3.6** and **Section 3.7**) to provide an informative comparison between monitoring events about the effectiveness of the control activities.
Restoration planting monitoring	Targeted infill and broadscale restoration plantings will be monitored regularly to assess the survival and stem density of planted species to inform the requirement for additional management including remedial plantings should the density and composition of species no longer meet the performance criteria.

[3] https://futurebeef.com.au/resources/brigalow-belt-pasture-photo-standards/
[4] https://www.ffm.vic.gov.au/__data/assets/pdf_file/0005/21110/Report-82-overall-fuel-assess-guide-4th-ed.pdf

Action	Outcome
Habitat quality assessments	Habitat quality assessments will be undertaken throughout the management period in accordance with the project specific MHQA method outlined in **Appendix A**. Habitat quality assessments will include two on ground assessment components: • Site condition assessments, and • Targeted fauna surveys Site condition assessments will be undertaken at fixed permanent monitoring points in the offset area capturing the required BioCondition site attribute data as well as site-specific data required for each species as specified in the project specific MHQA method. The results of the habitat quality assessments (including site condition and targeted fauna surveys) will be compared to the site- and species-specific targets, interim milestones and completion criteria included in the OMP to determine the progress of the offset area in achieving its required outcomes.
Targeted fauna surveys	Targeted fauna surveys will be undertaken to assess the presence and distribution of the MNES fauna offset values within the offset area. Fauna surveys will be conducted in Years 2, 5, 10, 15 and 20. The results of the fauna surveys will also inform calculation of the habitat quality scores in accordance with the project specific MHQA method. Targeted fauna surveys methods and timing will be informed by the recommended survey guidelines from the Queensland and Commonwealth or other reputable published guidelines and will include: • Diurnal bird surveys • Active diurnal searches: • Ort surveys/search for foraging signs • Spotlighting surveys • Call playback and passive acoustic surveys during the koala mating season • Harp trapping surveys • Koala Spot Assessment Technique (SAT) Surveys
Reporting	
Progress report	A report detailing the progress of the offset area in achieving the offset area outcomes will be prepared annually and submitted to the Commonwealth Government within 60 business days after the anniversary date of the approval of this OMP until the completion criteria are achieved. The report will include at a minimum: • a description of the monitoring program undertaken for the management year including timing, personnel and methods, • results of monitoring events conducted during the management year, • an overview of the management actions implemented since the last report, • a description of any management triggers that have been exceeded and the corrective actions that were implemented, • an indication of any additional risks or potential threats identified and activities to be undertaken to manage these threats and/or risks, • progress towards achieving the site- and species-specific performance targets, interim milestones and completion criteria during the corresponding management years that habitat quality assessments are undertaken as part of the monitoring program, • required updates and improvements to the OMP.

Action	Outcome
Review of OMP	The OMP will be reviewed as part of the progress report, and updated as required, to ensure the relevant management and monitoring programs remain current and effective in accordance with the adaptive management framework and are informed by up-to-date best practice information and species-specific conservation advice.

6.2 Offset cost estimate

A summary of the offset management, monitoring and reporting actions proposed as part of the OMP and their estimated costs for delivery over a 20-year period is provided in **Table 6.4**. It is important to note that these costs are provided as an estimate only and will be refined as required by Arrow CSG following approval of the OMP and prior to implementation.

Table 6.4: Estimated costs to deliver the proposed offset area

Activity	Estimated cost over 20 years
Management	
General restrictions	$24,000
Fencing and access	$990,000
Fire management	$540,000
Weed management	$192,000
Pest management	$192,000
Restoration planting	$862,560
Monitoring	
Offset area inspections	$474,000
Biomass monitoring	$360,000
Fuel load monitoring	$360,000
Weed monitoring	$108,000
Pest animal monitoring	$108,000
MNES habitat quality assessments	$1,020,000
Restoration planting monitoring	$216,000
Reporting	
Progress report	$480,000
Review of OMP	$48,000
Legal security	$60,000
Total	**$6,034,560**

6.3 Legal security

Prior to the commencement of the action Arrow CSG will legally secure the offset as a declared area of high nature conservation value under section 19E of the *Vegetation Management Act 1999*.

Within 18 months of the declared area being registered on title, Arrow CSG will subsequently secure the offset area with a covenant under the *Land Title Act 1994* for at least the duration of the impact. Prior to the application of the covenant, Arrow CSG will provide a copy of the terms to NEPA for review to ensure they are appropriate for the protection of MNES values at the offset area.

Should additional time be required to allow for further consultation between stakeholders, or delays beyond Arrow CSG's control, Arrow CSG will ensure NEPA is informed on their progress, with evidence, and proposed timing to secure the legally binding mechanisms.

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Appendix A

MHQA Methods

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SGP North Solar Farm

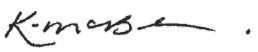
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4	18/09/2026	Update based on RFI from NEPA	Kate McBean, Principal Consultant / Team Leader – Biodiversity Offsets	

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1. Introduction

In accordance with the conditions outlined in the Preliminary Documentation (PD) for the Girrawheen Hybrid Power Facility (the Project) received from the Minister on the 19th March 2025, habitat quality scoring was undertaken in accordance with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Modified Habitat Quality Assessment (MHQA) method, dated the 28 May 2025, herein referred to as the MHQA method (DCCEEW 2025).

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

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

The Project-associated MNES which have been assessed as having potential to experience a Significant Residual Impact (SRI), and therefore require detailed habitat quality scoring and offsets include:

- Glossy black-cockatoo (south-eastern) (*Calyptorhynchus lathami lathami*) – Vulnerable
- Corben's long-eared bat (*Nyctophilus corbeni*) – Vulnerable
- Koala (combined populations of QLD, NSW and the ACT) (*Phascolarctos cinereus*) – Endangered
- Diamond firetail (*Stagonopleura guttata*) – Vulnerable
- Dunmall's snake (*Furina dunmalli*) – Vulnerable
- Squatter pigeon (*Geophaps scripta scripta*) – Vulnerable.

To ensure a consistent approach is undertaken at both the impact and offset area, for both baseline and future assessments, this document has been prepared to outline:

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

The scoring methodology has been consistently applied at both the impact and offset areas for each matter. Scores have been populated in the Assessment-template-MHQA-spreadsheet provided by DCCEEW (now known as the National Environmental Protection Agency [NEPA]) with the Preliminary Documentation (PD) Request for Information (RFI) received on the 16 March 2025, which has been modified to reflect the specific scoring approach outlined in this document.

2. MHQA methodology

2.1 Indicators and attributes

The MHQA method relies on detailed assessment of three indicators:

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

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

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

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

Table 2.1: MHQA assessment components – indicators and attributes

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

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

2.2 Score weighting

Scores generated for each indicator are weighted and combined to generate a final habitat quality score. This score is expressed as a value out of 10; following standard rounding procedures, the score is provided as the nearest whole number. Standard maximum indicator scores and weightings are specified according to matter type (e.g. fauna, flora or TEC) but the combined scores, once finalised and appropriately weighted, always result in a final habitat quality score out of 10. As the MNES values relevant to the project only include fauna values, a summary of the flora and TEC score weightings have not been included in this methodology document.

Table 2.2 summarises the maximum possible scores for each indicator alongside the standard or default weighting protocol. It worth noting that some of the Regional Ecosystems (REs) present within the impact and offset areas are classified as shrublands and have a different maximum score for site condition compared to the other woodland REs. These differences have also been included in **Table 2.2**. For the purpose of this assessment, standard weighting protocols have been amended to reflect species specific requirements and the revised weightings and justifications for each species is summarised in **Table 2.3**.

Table 2.2: Standard maximum indicator scores and weightings

Matter type	Site condition		Site context		Species stocking rate	
	Maximum score	Maximum weighted score	Maximum score	Maximum weighted score	Maximum score	Maximum weighted score
Fauna (woodland RE)	*100*	**3 (30%)**	*56*	**3 (30%)**	*70*	**4 (40%)**
Fauna (shrubland RE)	*80*	**3 (30%)**	*56*	**3 (30%)**	*70*	**4 (40%)**

Table 2.3: Proposed alternative maximum indicator scores and weightings

Matter	Site condition	Site context	Species stocking rate	Justification
	Maximum weighted score	Maximum weighted score	Maximum weighted score	
Glossy black-cockatoo	**4 (40%)**	**3 (30%)**	**3 (30%)**	This species feeds almost exclusively on seeds from sheoak trees (Casuarinaceae) and requires large tree hollows for nesting - factors strongly linked to its local presence (DCCEEW 2022a). These key

Matter	Site condition	Site context	Species stocking rate	Justification
	Maximum weighted score	Maximum weighted score	Maximum weighted score	
				ecological attributes have been incorporated into the **species habitat indices** (**Section 3.1.1**), which are nested within the ***site condition*** scoring framework. As such, the weighting of the ***site condition*** indicator has been increased by 1-point (10%), with a 1-point (10%) reduction from **species stocking rate**, to better reflect these requirements. While capable of powered flight, the species' strong mobility limits the ability to assess population dynamics at small spatial scales and complicates interpretation of landscape-scale factors. Accordingly, greater emphasis has been placed on ***site condition*** over ***site context*** and ***species stocking rate*** as a more reliable indicator of habitat quality.
Corben's long-eared bat	**5 (50%)**	**3 (30%)**	**2 (20%)**	This species can utilise a wide range of inland woodland habitats, and is more commonly recorded in larger, contiguous areas of habitat (DAWE 2015). It is also difficult to detect with capture required to confirm presence. As such, increased score weightings for ***site condition*** (5 points [50%]) and ***site context*** (3 points [30%]) have been applied to reflect the habitat associations and landscape scale features utilised by the species. Due to the poor detectability of the species, ***species stocking rate*** score weighting has been reduced to 2 points (20%).
Koala	**3 (30%)**	**3 (30%)**	**4 (40%)**	Although not clearly defined in the *Guidance on the use of the Modified Habitat Quality Assessment method* (DCCEEW 2025), the default indicator weighting is based on koala habitat requirements and therefore will be retained for scoring.
Diamond firetail	**4 (40%)**	**3 (30%)**	**3 (30%)**	This open woodland species relies primarily on grass seeds for foraging and is largely sedentary, although some localised movement may occur in response to seasonal conditions (DCCEEW 2023a). A minimum patch size of 200 ha is also required to maintain population viability (DCCEEW 2023a). While these factors all contribute to habitat quality, the species' mobility makes it difficult to accurately quantify population dynamics (**species stocking rate**). Although ***site context*** remains relevant, the multiple species-specific scoring parameters developed for the species habitat indices - nested within ***site condition*** scoring (see **Section 3.4.1**) - are considered more quantifiable. Consequently, the weighting of the ***site condition*** indicator has been increased by 1 point (10%), taken from the ***species***

Matter	Site condition	Site context	Species stocking rate	Justification
	Maximum weighted score	Maximum weighted score	Maximum weighted score	
				stocking rate, to better reflect the species' measurable ecological attributes.
Dunmall's snake	**5 (50%)**	**3 (30%)**	**2 (20%)**	This nocturnal reptile is known to utilise a broad range of habitats within the Brigalow Belt where it is thought to feed on skinks and geckos and seek shelter under fallen timber, ground litter and within soil cracks (DoE 2026b). Despite this, very little is actually known about the ecology of this cryptic species, and it is generally thought to be uncommon within its known distribution (DoE 2014). As such, increased score weightings for ***site condition*** (5 points [50%]) and ***site context*** (3 points [30%]) have been applied to reflect the habitat associations and landscape scale features utilised by the species. Due to the poor detectability of the species, ***species stocking rate*** score weighting has been reduced to 2 points (20%).
Squatter Pigeon	**4 (40%)**	**3 (30%)**	**3 (30%)**	This granivorous species occurs within open forest to sparse open woodland typically dominated in the overstory by *Eucalypt*, *Acacia*, *Callitris* and *Melaleuca* species (DoE 2026a). The squatter pigeon is heavily reliant on groundcover vegetation within proximity of a permanent water source for both suitable foraging and nesting habitat. As such, the weighting of the ***site condition*** indicator has been increased by 1-point (10%), with a 1-point (10%) reduction from ***species stocking rate*** to better reflect these requirements. While they are capable of powered flight, this species is largely thought to be sedentary although localised dispersal may occur in response to water availability and seasonal abundances of grass seeds. Accordingly, a greater emphasis has been placed on ***site condition*** over ***site context*** and ***species stocking rate*** as a more reliable indicator of habitat quality.

2.3 Site condition

The ***site condition*** indicator is primarily based on 13 pre-determined floristic and structural field attributes which are measured and assessed in accordance with Section 5 of the Guide (DEHP 2017). This involves the establishment of 100 x 50 m sample sites (0.5 ha plots) in relevant representative vegetation types within which the site-specific field attributes are measured (see section 4.4 of the Guide for how to determine the number and location of sample sites). Sub-plots and a central transect within the larger overall sample site are also used to measure specific data (**Table 2.4**). For offset sites, these plots are fixed and permanent.

Once field data is collected, scores are then derived through comparison to benchmarks for each RE (from the *BioCondition Benchmark Database, Version 3.6* [Queensland Herbarium and Biodiversity Science 2025]), as outlined in Table 2 of the Guide and replicated below in **Table 2.4** (noting there are some errors in Table 2 of the Guide which have been corrected below as per guidance in the MHQA method). Relevant RE benchmarks for the Project are presented in **Appendix A**, **Table A1**.

Table 2.4: Scoring for the 13 site condition attributes

Attribute	Attribute measurement area	Score categories and scales				
Recruitment of woody perennial species in EDL	100 x 50 m plot	**Score**	**0**	**3**		**5**
		Benchmark	<20%	>20-75%		>75%
Native plant species richness - trees	100 x 50 m plot	**Score**	**0**	**2.5**		**5**
		Benchmark	<25%	≥25-90%		≥90%
Native plant species richness - shrubs	50 x 10 m sub-plot	**Score**	**0**	**2.5**		**5**
		Benchmark	<25%	≥25-90%		≥90%
Native plant species richness - grasses	50 x 10 m sub-plot	**Score**	**0**	**2.5**		**5**
		Benchmark	<25%	≥25-90%		≥90%
Native plant species richness - forbs	50 x 10 m sub-plot	**Score**	**0**	**2.5**		**5**
		Benchmark	<25%	≥25-90%		≥90%
Tree canopy height	100 x 50 m plot	**Score**	**0**	**3**		**5**
		Benchmark	<25%	>25-70%		>70%
Tree canopy cover	100 m transect	**Score**	**0**	**2**	**3**	**5**
		Benchmark	<10%	>10%-<50%	>200%	>50%-<200%
Shrub canopy cover	100 m transect	**Score**	**0**	**3**		**5**
		Benchmark	<10%	≥10%–<50% or >200%		>50%–<200%
Native perennial grass cover	1 x 1 m sub-plots (x 5)	**Score**	**0**	**1**	**3**	**5**
		Benchmark	<10%	>10–50%	>50–90%	>90%
Organic litter	1 x 1 m sub-plots (x 5)	**Score**	**0**	**3**		**5**
		Benchmark	<10%	≥10%–<50% or >200%		>50%–<200%
Large trees	100 x 50 m plot	**Score**	**0**	**5**	**10**	**15**
		Benchmark	0%	0–50%	>50–100%	>100%
Coarse woody debris	50 x 20 m sub-plot	**Score**	**0**	**2**		**5**
		Benchmark	<10%	<50% or >200%		>50% or <200%

Attribute	Attribute measurement area	Score categories and scales				
Non-native plant cover	50 x 10 m sub-plot	**Score**	**0**	**3**	**5**	**10**
		% of weed cover	>50%	>25–50%	>5–25%	<5%

2.3.1 Species habitat indices

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

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

Assessment of these **SHI** is undertaken generally in accordance with Section 7 of the Guide, however, scoring for **SHI** relies on the development of species-specific parameters informed by the ecological requirements of each species. Examples include the *presence of micro-habitat features for shelter* or the *relative abundance of specific food resources*. Detailed **SHI** scoring parameters and their application for each relevant species are provided in **Section 3**. Although the scoring for **SHI** is consistent with Table 4 of the Guide (replicated in **Table 2.5**), a slight adjustment on scoring is made where multiple parameters are assessed. For example, where two or more parameters are used, scores are combined and transformed to a score out of 10 (e.g. summed score divided by the maximum possible score, then multiplied by 10).

Additionally, deriving appropriate scoring benchmarks for species-specific habitat parameters can be challenging. Where directly applicable, benchmarks provided in the Benchmark Database (Queensland Herbarium and Biodiversity Science 2025) were utilised. In cases where no suitable benchmarks were available, RE Technical Descriptions (Queensland Herbarium 2018) were used to derive scoring benchmarks. Specifically, data for relevant flora species listed under *Frequent species* in each technical description was used to develop benchmarks for REs to score some attributes. For example, when a species relies on a subset of flora species for foraging resources, the total cover across strata of these species within each applicable RE was summed to generate a benchmark. Similarly, where flora species richness was the relevant scoring parameter, benchmarks were derived by counting all relevant species listed in the applicable strata. The application of these benchmarks is discussed further in **Section 3**.

Table 2.5: Scoring for species habitat indices

Attribute	Parameter measurement area	Score categories			
Quality and availability of food and foraging habitat (fauna only)	Specified for each parameter in **Section 3**	Score	**1**	**5**	**10**
		Description	Poor	Moderate	High
Quality and availability of shelter (fauna only)	Specified for each parameter in **Section 3**	Score	**1**	**5**	**10**
		Description	Poor	Moderate	High

2.4 Site context

The ***site context*** attributes, and assessment scales, are summarised in **Table 2.6** in accordance with Section 6 and Section 7 of the Guide (DEHP 2017). The impact and offset areas are located within fragmented landscapes, therefore the ***site context*** scoring protocols follow those in a fragmented landscape (Brigalow Belt bioregion). Scoring methods for each attribute are described below from **Section 2.4.1** to **Section 2.4.7**.

Table 2.6: Site context scoring attributes and maximum scores

Attribute	Assessment Scale	Maximum Score
Size of patch	Matter Area	10
Connectedness	Matter Area	5
Context	Matter Area	5
Ecological Corridors	Matter Area	6
Role of site location to species/TEC overall population in the state	Matter Area	5
Threats	Matter Area	15
Species mobility capacity	Matter Area	10

2.4.1 Size of patch

Size of patch is assessed via a desktop spatial analysis to measure the size of the matter area for each MNES and all other directly connecting areas of mapped remnant or regrowth vegetation (i.e. Category B, C or R regulated vegetation) where these may support suitable habitat for the MNES.

The size of patch assessment is undertaken in accordance with Section 6.1.1 of the BioCondition Assessment Manual (Eyre *et al*. 2015), as opposed to the method outlined in the Guide. This approach is considered more robust as it incorporates the presence of both remnant and regrowth vegetation in the assessment. The scoring categories reflect those presented in Table 15 of the BioCondition Assessment Manual as replicated below in **Table 2.7**. Assessment of **size of patch** may utilise alternative spatial datasets representing species-specific habitat (only when available and relevant) within the matter area and directly connected areas of suitable habitat.

Where a matter area and its directly connected areas of remnant and regrowth vegetation comprises multiple, discrete polygons, each polygon will be individually scored using the categories in **Table 2.7** and then the average score across the different areas will be used as the **size of patch** score for the matter area.

Table 2.7: Scoring for size of patch

Description	Score
<5 ha of remnant AND/OR regrowth vegetation	0
≥5-25 ha of remnant AND/OR regrowth vegetation	2
≥25-100 ha remnant OR ≥25-200 ha remnant and regrowth OR ≥25-200 ha regrowth vegetation	5
≥100-200 ha remnant OR >200 ha remnant and regrowth OR >200 ha regrowth vegetation	7
≥200 ha remnant vegetation	10

2.4.2 Connectedness

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

Connectedness assessments are undertaken in accordance with Section 6.1.2 of the BioCondition Assessment Manual (Eyre *et al.* 2015), as opposed to the method outlined in the Guide. This approach is considered more robust as it incorporates the presence of both remnant and regrowth vegetation (i.e. Category B, C or R regulated vegetation) in

the assessment. The scoring categories reflect those presented in Table 16 of the BioCondition Assessment Manual as replicated below in **Table 2.8**.

Assessment of **connectedness** may utilise alternative spatial datasets representing species-specific habitat (only when available and relevant) within the matter area and directly connected areas of suitable habitat.

Table 2.8: Scoring for connectivity in the landscape

Description	Score
The matter area is not connected using any of the below descriptions	0
The matter area is adjacent to remnant vegetation along >10% to <50% OR The matter area is adjacent to remnant vegetation along <10% of its perimeter AND is connected with adjacent regrowth vegetation along >25% of its perimeter	2
The matter area is connected with adjacent remnant along 50%-75% of its perimeter	4
The matter area is connected with adjacent remnant vegetation along >75% of its perimeter OR the matter area is >500 ha of remnant vegetation	5

2.4.3 Context

Context is assessed generally in accordance with Section 6 (Step 4) of the Guide (DEHP 2017) with the following modifications:

- the assessment approach outlined in the Guide may be modified by replacing remnant vegetation with alternative spatial datasets which represent species-specific habitat (only when available and relevant).
- where relevant, a matter-specific buffer distance should be applied rather than the standard 1 km buffer to 'better reflect the species mobility and utility of adjacent habitat'.

The buffer is to be applied from the boundary of the matter area using the buffer distances for each MNES listed in **Table 2.9**. **Context** is scored using four broad categories consistent with Table 3 of the Guide as replicated below in **Table 2.10**.

Table 2.9: Matter-specific context buffer distances

Matter	Buffer distance	Justification
Glossy black-cockatoo	15 km	This species is known to commute up to 14 km daily to forage (DCCEEW 2022a). As such, 15 km is a precautionary distance to allow for daily foraging or dispersal.
Corben's long-eared bat	5 km	This species is known to travel distances of up to 4 km each night between day roosts and may travel further as required (DAWE 2015). As such, 5 km is a precautionary distance to allow for daily foraging or dispersal events.
Koala	10 km	According to Dique *et al.* (2003), the mean straight-line distance between the natal and breeding home ranges for koalas ranged from 300 m to 10.6 km and averaged 3.4 km for females and 3.5 km for males. 10 km is well above the average but also accounts for the maximum home range size.
Diamond firetail	1 km	This species requires a minimum patch size of 200 ha to maintain a viable population (DCCEEW 2023a). The radius of a 200-ha circle is 800 m. This is well below the standard buffer distance and the species is largely sedentary. The

Matter	Buffer distance	Justification
		standard 1 km buffer distance (which equates to over 300 ha) has been used for this species as a precautionary approach.
Dunmall's snake	1 km	Very little is known about the ecology or movement patterns of Dunmall's snake (DoE 2026b). The lack of daily, monthly and yearly movement of similar sized elapids is well documented, with movements of a similar sized species of elapid less than 200 m per month (Webb and Shine 1997). Dunmall's snake is known to utilise a broad range of habitats within the Brigalow Belt, feed on skinks and geckos and seek shelter under fallen timber and ground litter (DoE 2026b). The relatively isolated nature of records throughout their known distribution in Queensland indicates that prior to European settlement, these populations were much more connected. It is possible that genetic exchange still occurs between these isolated populations. As such, a highly conservative and precautionary distance of 1 km has been assigned to this species to account for individuals dispersing during periods of low resource availability or in search of mates.
Squatter pigeon (southern)	10 km	Whilst there is some evidence to suggest that the squatter pigeon may move locally in response to seasonal resource availability and rainfall patterns, at the species level they are sedentary or locally nomadic (DoE 2026a). When localised dispersal does occur, the squatter pigeon may disperse along vegetated corridors to access permanent water sources elsewhere in the region. As such, a precautionary buffer distance of 10 km has been selected for this species to account for dispersal in response to lack of permanent water.

Table 2.10: Scoring for context

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

2.4.4 Ecological corridors

Proximity **to Ecological corridors** is assessed in accordance with Section 6.2 (Step 6) of the Guide (DEHP 2017). An 'ecological corridor' is represented as any 'Riparian' or 'Terrestrial' feature within the 'CORR_TYPE' attribute table of the 'Queensland statewide corridors' spatial layer. Scoring is consistent with Table 3 of the Guide as replicated in **Table 2.11**.

Table 2.11: Scoring for ecological corridors

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

2.4.5 Role of site location for the population in the State

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

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

Definitions of HCSS for each matter is summarised in **Table 2.12**. The scoring categories used for this attribute are consistent with Table 4 of the Guide as replicated in **Table 2.13**, however the approach has been modified slightly. In instances where HCSS obviously occurs within the impact area/offset area based on these definitions then the highest score (5) is awarded. In instances where no HCSS is present then the lowest score (1) is awarded. For all other instances where it is hard to define HCSS for the species, a conservative approach has been taken, and a moderate score (4) is awarded.

Table 2.12: Definitions of habitat critical to the survival of the species (HCSS)

Matter	HCSS definition
Glossy black-cockatoo	As per the species Conservation Advice (DCCEEW 2022a), there is no species-specific definition of HCSS for glossy black-cockatoo. As such, the standard definition in DoE (2013) has been applied.
Corben's long-eared bat	There is no species-specific definition of HCSS for Corben's long-eared bat (DAWE 2015). As such, the standard definition has been applied.
Koala	According to the species Conservation Advice (DCCEEW 2022b), HCCS is broadly defined as *areas that the species relies on to avoid or halt decline and promote the recovery of the species*. The following factors are to be considered when identifying HCSS: • whether the habitat is used during periods of stress (e.g. flood, drought or fire) • whether the habitat is used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes) • the extent to which the habitat is used by important populations • whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development

Matter	HCSS definition
	• whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements • whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation • any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community.
Diamond firetail	As per the species Conservation Advice (DCCEEW 2023a), HCSS includes areas of: • eucalypt, Acacia or Casuarina woodlands, open forests and other lightly timbered habitats • low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding • Drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges.
Dunmall's snake	Whilst the Conservation Advice (DoE 2014) does not provide a definition for HCSS for the Dunmall's snake, the draft referral guidelines for brigalow reptiles (DCCEEW 2023b) regards any suitable habitat as important habitat. Important habitat for listed brigalow reptiles should incorporate any large patches of contiguous, suitable habitat and viable landscape corridors which are necessary for the purpose of breeding, dispersal or maintaining the genetic diversity of the species over successive generations (DCCEEW 2023b). Considering the location of the Project within the broader landscape, and the contiguous nature of the surrounding vegetation, suitable habitat identified within the Project area is likely to constitute 'habitat critical to the survival of the species'.
Squatter Pigeon	As per the species Conservation Advice (TSSC 2015), there is no species-specific definition of HCSS for the squatter pigeon. As such, the standard definition in DoE (2013) has been applied.

Table 2.13: Scoring for role of the site location to species overall population in the state

Description	Score
Not or unlikely to be critical to species' survival	1
Likely to be critical to species' survival	4
Critical to species survival	5

2.4.6 Threats

For each MNES, **Section 3** provides a detailed assessment of each species-specific threatening process, identified in relevant conservation and statutory documents, as well as a justification for its inclusion or exclusion from the habitat quality assessment process.

Using DCCEEW's threat risk matrix[1] (**Table 2.14**) and advice in species conservation documents, risk ratings have been assigned for each **threat** presented in **Section 3**. Risk ratings are low, moderate, high and very high considering the consequence and likelihood of occurrence across the range and extent of the species.

[1] As part of more recently developed MNES species conservation advice in the DCCEEW Species profiles and Threats database, DCCEEW has developed a risk matrix in consultation with list experts/community and in-house expertise using available literature. The same risk matrix has been adopted as part of this MHQA method.

Likelihood categories are defined as:

- Almost certain – expected to occur every year
- Likely – expected to occur at least once every 5 years
- Possible – might occur at some time
- Unlikely – such events are known to have occurred on a worldwide basis but only a few times
- Unknown – currently unknown how often the incident will occur

Consequence categories are defined as:

- Not significant – no long-term effect on individuals or populations
- Minor – individuals are adversely affected but no effect at population level
- Moderate – population recovery stalls or reduces
- Major – population decreases
- Catastrophic – population extirpation/extinction

The resulting risk rating for each **threat** is quantified as presented in **Table 2.14**. The five-point rating scale is derived from Table 2.4 of the Guide to determining terrestrial habitat quality Version 1.3 (DES 2020), noting that the consequence values have been ordered from 'not significant' to 'catastrophic' which is the inverse of DES 2020[2]. The quantified risk rating is also the 'threat multiplier' used to calculate the final weighted threats score for the ***site context*** assessment.

Table 2.14: DCCEEW's threat risk matrix and threat multipliers

Likelihood	Consequences				
	Not significant (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Catastrophic (5)**
Almost certain (5)	Low risk (5)	Moderate risk (10)	Very high risk (15)	Very high risk (20)	Very high risk (25)
Likely (4)	Low risk (4)	Moderate risk (8)	High risk (12)	Very high risk (16)	Very high risk (20)
Possible (3)	Low risk (3)	Moderate risk (6)	High risk (9)	Very high risk (12)	Very high risk (15)
Unlikely (2)	Low risk (2)	Low risk (4)	Moderate risk (6)	High risk (8)	Very high risk (10)
Unknown (1)	Low risk (1)	Low risk (2)	Moderate risk (3)	High risk (4)	Very high risk (5)

For some MNES, the species conservation advice includes an assessment of known threats and subsequent classification of each threat using the risk matrix. Where this is available, the nominated level of risk is used as part of this assessment. In instances where the risk associated with the identified threatening processes are not categorised in the species' conservation advice, a similar assessment process was undertaken using the DCCEEW risk matrix considering the relevant statutory documents for each species (see **Section 3** for each species assessment).

To calculate the final weighted **threat** score for the ***site context*** assessment, each identified threat in **Section 3** is independently scored based on Section 7.2 and Table 4 of the Guide (DEHP 2017), as replicated in **Table 2.15**. The resulting scores for each threat are subsequently weighted using the 'threat multiplier' (**Table 2.14**) to reflect their individual severity, and combined to determine a score out of 15, to incorporate into the broader assessment of site

[2] The approach to assessing threats to MNES as part of the Guide to determining terrestrial habitat quality Version 1.3 (DES 2020) uses a threat matrix to score each threat factor according to its scope and severity, adapted from IUCN-CMP (2007). While this MHQA Method has been developed based on the Guide (DEHP 2017), the five-point score scaling used as part of Guide to determining terrestrial habitat quality Version 1.3 (DES 2020) more closely aligns with the DCCEEW's threat risk matrix, compared to the 'Threats to species' assessment used as part of the Guide (DEHP 2017).

context. The combined threats score is calculated using the following formula (e.g. summed score divided by the maximum possible score, then multiplied by 15):

$$= \frac{(Threat\ 1\ score\ x\ Threat\ 1\ risk\ rating) + (Threat\ 2\ score\ x\ Threat\ 2\ risk\ rating)}{(Threat\ 1\ max.score\ x\ Threat\ 1\ risk\ rating) + (Threat\ 2\ max.score\ x\ Threat\ 2\ risk\ rating)} \times 15$$

Table 2.15: Scoring for threats

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

2.4.7 Species mobility capacity

Species mobility capacity is only relevant for certain fauna species. Assessment and scoring for **species mobility capacity** is undertaken in accordance with Section 7.2 of the Guide (DEHP 2017). The Guide defines species mobility capacity as, "*the presence and severity of factors that would contribute to a reduction in the mobility of the species. For example, when a barrier to movement is created within or between habitats that is likely to result in a long-term reduction in genetic fitness or access to important resources.*"

For each MNES, **Section 3** provides a description of the site-specific factors that may be contributing to a reduction in the mobility of the species, and defines relevant parameters and scoring scales to assess these. Scoring for each parameter is consistent with Section 7.2 and Table 4 of the Guide (DEHP 2017), as replicated in **Table 2.16**. A slight modification on scoring is made where multiple parameters (i.e. factors impacting mobility capacity) are assessed. For example, where two or more parameters are used, scores are combined and transformed to a score out of 10 (e.g. summed score divided by the maximum possible score, then multiplied by 10).

Table 2.16: Scoring for species mobility capacity

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

2.5 Species stocking rate

Assessment and scoring of the ***species stocking rate (SSR)*** indicator is exclusively based on the MHQA method and is only required for fauna and flora. Scoring inputs evaluate each species' broader distribution, abundance, and site use. The attributes assessed for fauna-specific ***SSR*** are:

- Presence detected on or adjacent to site (neighbouring property with connecting habitat)
- Species usage of the site (habitat type and evidenced usage)
- Approximate density (per ha)
- Role/importance of species population on site

Details of the methods and scoring for each ***SSR*** attribute is described in **Sections 2.5.1** to **Section 2.5.4**. Note, as no flora are expected to be significantly impacted by the Project, methods for assessing flora ***SSR*** are not described in this document.

2.5.1 Presence detected on or adjacent to site

This attribute was assessed for each MNES using observational data from site-specific field surveys and publicly available verified species records. A summary of the survey efforts undertaken across the impact area is presented in the Preliminary Documentation, whilst survey methodologies within the offset area are specified in the Projects Offset Management Plan (OMP).

The definitions of 'on site' and 'adjacent to site' are based on species-specific characteristics, particularly mobility and dispersal potential. These definitions align with the approach used to determine context scores (see **Section 2.4.3**), applying the same species-specific buffer distances. The definition of 'on-site' and 'adjacent to site' for each MNES are presented in **Table 2.17** below. Scoring for this attribute is consistent with the MHQA method as described in **Table 2.18**.

Table 2.17: Definitions of 'presence detected on or adjacent to site'

Matter	Definition of 'on-site'	Definition of 'adjacent to site'
Glossy black-cockatoo	Record or evidence within the MNES matter area	Record or evidence within 15 km of the MNES matter area
Corben's long-eared bat	Record or evidence within the MNES matter area	Record or evidence within 5 km of the MNES matter area
Koala	Record or evidence within the MNES matter area	Record or evidence within 10 km of the MNES matter area
Diamond firetail	Record or evidence within the MNES matter area	Record or evidence within 1 km of the MNES matter area
Dunmall's snake	Record or evidence within the MNES matter area	Record or evidence within 1 km of the MNES matter area

Table 2.18: Scoring for presence detected on or adjacent to site

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

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

This attribute was scored using species-specific habitat mapping defined as part of the Project's Preliminary Documentation in accordance with relevant statutory documentation. Scoring for this attribute is consistent with the MHQA method as described in **Table 2.19**. When species habitat categorisation deviated from the standard procedure, a precautionary scoring approach was applied. For instance, if foraging and breeding habitats were combined for a matter, the highest score of 15 was assigned.

Table 2.19: Scoring for species usage of the site

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

2.5.3 Approximate density (per ha)

Estimating the density of wild populations is particularly challenging where survey areas are spatially limited or where species are cryptic or seasonal in their detectability. These limitations in estimating fauna density have been well documented (e.g. Duckworth 1998; Gilbert *et al.* 2020). Accordingly, **approximate density (per ha)** scoring varies between matters and may rely on quantitative data, qualitative data, or a combination of both. The specific methods applied for each matter are detailed in **Section 3**, however, overall scoring for this attribute is consistent with the MHQA method as described in **Table 2.20**.

Table 2.20: Scoring for approximate density

Attribute	Scoring				
Approximate density (per ha)	**Score**	**0**	**10**	**20**	**30**

2.5.4 Role/importance of species population on site

This attribute uses multiple parameters that each have a binary scoring protocol. All were assessed for each matter using the definitions described below and the standard MHQA scoring protocols presented in **Table 2.21**. The scores from each parameter are summed and used to derive the final score for this attribute (**Table 2.22**).

Key source population for breeding

The maximum score as per **Table 2.21** was applied for this parameter where:

- An important population defined for the species intersects the matter area, and
- Habitat present is known breeding habitat.

Otherwise, a score of 0 was applied.

Key source population for dispersal

The maximum score as per **Table 2.21** was applied for this parameter where:

- An important population defined for the species intersects the matter area, and
- Habitat present is known dispersal habitat.

Otherwise, a score of 0 was applied.

Near the limit of the species range

This attribute was scored using spatial analysis based on DCCEEW's *Species of National Environmental Significance* (SNES) distribution mapping. A species was considered near the limit of its range (and assigned the maximum score in **Table 2.21**) if the impact or offset area was located within 10 km of the SNES-defined distribution boundary, noting this data has been gridded to 1 km or 10 km, depending on species sensitivity.

Necessary for maintaining genetic diversity

The maximum score as per **Table 2.21** was applied for this parameter where:

- An important population defined for the species intersects the matter area, and
- There is available evidence to suggest that this population is necessary for maintaining genetic diversity.

Otherwise, a score of 0 was applied.

Table 2.21: Supplementary scoring for role/importance of species population on site

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

Table 2.22: Final scoring for role/importance of species population on site

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

3. Species-specific scoring parameters

3.1 Glossy black-cockatoo

Glossy black-cockatoos are highly dependent on the seeds of she-oaks (Casuarinaceae) as a primary foraging resource, often relying on a subset of species according to region (DCCEEW 2022a). Based on those listed within the species Conservation Advice (DCCEEW 2022a), up to six foraging she-oak species for the glossy black-cockatoo could occur in the region. These are summarised below in **Table 3.1**.

Table 3.1: Potential foraging tree species – glossy black-cockatoo

Regional she-oak species	
Allocasuarina inophloia	*Allocasuarina torulosa*
Allocasuarina littoralis	*Casuarina cristata*
Allocasuarina luehmannii	*Casuarina cunninghamiana*

3.1.1 Site condition – Species Habitat Indices

3.1.1.1 Quality and availability of food and foraging habitat

Due to their strong reliance on specific sheoak species, the presence and diversity of those species within areas of habitat are critical when determining the quality and availability of foraging resources and therefore foraging habitat quality (DCCEEW 2022a).

The first parameter, *availability of foraging trees*, measures the availability of foraging resources by assessing the canopy cover of the foraging tree species presented in **Table 3.1**, which is likely to correlate with potential seed production. Scoring benchmarks for this parameter were derived using RE Technical Description data (Queensland Herbarium 2018). This involved calculating total foraging tree cover values for four applicable strata: Emergent, T1 (tree canopy), T2, and T3 (tree subcanopy) for each RE present. The resulting benchmarks are presented in **Appendix A**, **Table A2**. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 6) and the total cover of relevant foraging trees present is compared to the benchmark and scored using **Table 3.2**. Score scaling presented in **Table 3.2** is based on Section 5.1 of the Guide (Table 2: Tree canopy cover), however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

The second parameter, *foraging tree species richness*, measures the richness of preferred foraging species listed in **Table 3.1** at each site. Sites supporting higher richness are considered to provide more foraging opportunities and therefore higher-quality habitat. Benchmarks for this parameter were also derived from RE Technical Description data (Queensland Herbarium 2018) and are presented in **Appendix A**, **Table A2**. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 2) and the number of foraging tree species recorded is compared to the benchmark and scored using **Table 3.2**. Score scaling presented in **Table 3.2** is based on Section 5.1 of the Guide (Table 2: Native plant species richness – trees).

Table 3.2: Quality and availability of food and foraging habitat parameters – glossy black-cockatoo

Parameter	Parameter measurement area	Score		
		1	5	10
*Availability of foraging trees**	100 m transect	<10% of foraging tree cover benchmark	≥10 to 50% of foraging tree cover benchmark	>50% of foraging tree cover benchmark

Parameter	Parameter measurement area	Score		
		1	5	10
*Foraging tree species richness**	100 x 50 m plot	<25% of foraging tree species richness benchmark	≥25 to 90% of foraging tree species richness benchmark	>90% of foraging tree species richness benchmark

*See **Appendix A, Table A2** for species specific benchmarks

3.1.1.2 Quality and availability of shelter

Glossy black-cockatoos require eucalypt hollows with specific traits for nesting. Potential nest hollows may be >8 m above the ground, located in branches >30 cm in diameter at >45°, with an entrance diameter of >15 cm, however, further research is needed to better understand nesting habitats and habitats (DCCEEW 2022a).

Breeding habitat does not always overlap with foraging areas (sheoak occurrence is often patchy and sporadic) and therefore the species may undertake daily commutes (DCCEEW 2022a). According to the Conservation Advice (DCCEEW 2022a), the movements of the Kangaroo Island subspecies (*C. l. halmaturinus*) have undergone the most investigation and have been found to commute up to 14 km between nesting hollows and foraging areas without a reduction in reproductive success (DCCEEW 2022a). However, nesting hollows are typically located within 1 km of foraging resources and in relative proximity (<200 m) to permanent water (DCCEEW 2022a).

The first parameter is *proximity to permanent water* with scoring following the suggested daily commutes but with a lower threshold for the maximum score due the reduced preferred distance to surface water (200 m [DCCEEW 2022a]). As presented in **Table 3.3**, sites within 200 m are assigned the highest score. Permanent water is defined as permanent natural wetlands, lakes, farm dams and all major watercourses (stream order 3 and above).

As per Eyre *et al.* (2022), terrestrial hollow surveys are considered unreliable and tend to show observer-related bias, with large tree abundance a more accurate surrogate to determine hollow availability. Although the species shows preferences for highly specific hollows in very old trees (DCCEEW 2022a), a precautionary approach has been taken in the assessment of hollow availability by using the parameter, *number of eucalypt tree > 30cm DBH*. This approach counts all large trees which may support hollows as well as potential future hollow-bearing trees. All eucalypt trees with a DBH greater than 30 cm are counted within the 100 x 50 m plot and the total number (after being multiplied by 2) is compared to the RE benchmark "Large eucalypt per ha" presented in **Appendix A**, **Table A1**. The parameter is scored using **Table 3.3** Score scaling presented in **Table 3.3** was informed by Section 5.1 of the Guide (Table 2: Large trees). Note that, comparison with the RE benchmark "Large eucalypt per ha" is considered a reasonable surrogate benchmark given there is no available benchmark for the number of eucalypt trees greater than 30 cm DBH.

Table 3.3: Quality and availability of shelter habitat parameters – glossy black-cockatoo

Parameter	Parameter measurement area	Score		
		1	5	10
Proximity to permanent water (natural wetlands, lakes, farm dams and stream order 3 and above)	Transect centre point	>14 km from permanent water	14 km to 200 m from permanent water	Within 200 m of permanent water
*Number eucalypt tree > 30cm DBH**	100 x 50 m plot	0 to 50% of RE benchmark for large eucalypt trees	>50 to 100% of RE benchmark for large eucalypt trees	>100% of RE benchmark for large eucalypt trees

*See **Appendix A, Table A1** for RE benchmarks

3.1.2 Site context

3.1.2.1 Threats

3.1.2.1.1 Summary of relevant threats

A summary of the threats identified for the glossy black-cockatoo in the species Conservation Advice (DCCEEW 2022a) is provided in **Table 3.4**. Justifications for each threat's inclusion or exclusion in the threat assessment has also been provided. Several key threats are considered relevant for this species and have been included in the assessment, these are inappropriate fire regimes, clearing of suitable glossy black-cockatoo habitat, habitat degradation by livestock and predation by pest animals (feral cat and European red fox). For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified. Risk ratings have been assigned for each threat based on the risk assessment in the species Conservation Advice (DCCEEW 2022a).

Table 3.4: Summary of threats – Glossy black-cockatoo

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk Rating
Inappropriate fire regimes (DCCEEW 2022a)	Yes	The impact and offset areas contain habitat for this species that may be impacted by inappropriate fire regimes.	*Potential for inappropriate fire regimes*	Very high risk (20)
Clearing of native vegetation/timber harvesting (DCCEEW 2022a) and habitat fragmentation (DCCEEW 2022a)	Yes	Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate pastoral activities, and development of CSG infrastructure. Therefore, clearing of native vegetation and consequential habitat fragmentation are both potential threats at the impact and offset sites.	*Vegetation protection status*	Very high risk (20)
Habitat degradation caused by livestock grazing (DCCEEW 2022a)	Yes	The impact and offset sites are in areas where habitat has been historically impacted by domestic livestock grazing.	*Grazing intensity*	Moderate risk (6)
Predation by feral animals (DCCEEW 2022a)	Yes	Predation by feral animals (including cats and foxes) is listed as a threatening process for this species, and these species are likely to be present at the impact and offset site.	*Feral Cat Activity Index and European red fox Activity Index*	Moderate risk (8)
Invasive weeds (DCCEEW 2022a)	No	More research is required to understand the weed species which may impact south-eastern glossy black cockatoo feeding and breeding habitats, and the extent of this threat.	N/A	N/A

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk Rating
Climate change (DCCEEW 2022a)	No	Climate change will increase and continue to increase the likelihood of extreme events such as wildfires, floods, droughts and heatwaves. It may also affect the temporal or spatial shift of foraging resource availability for species with specific foraging requirements. As climate change is a broader scale ecological threat, and is generally consistent between the impact and offset site, it has been excluded from the threat assessment.	N/A	N/A
Competition for nest hollows (DCCEEW 2022a)	No	The south-eastern glossy black-cockatoo is especially vulnerable to hollow loss as they often nest in loose aggregations, and nest areas have relatively high densities. This impact is a landscape scale threat, therefore, competition for hollows with other native species and has not been incorporated into this analysis.	N/A	N/A
Psittachine Beak and Feather Disease (PBFD) (DCCEEW 2022a)	No	Whilst glossy black-cockatoos are susceptible to PBFD the threat level is relatively low and is considered to be a landscape level threat.	N/A	N/A
Illegal avian trade of birds and eggs (DCCEEW 2022a)	No	The extent of this threat is not known and is considered to be a landscape level threat.	N/A	N/A

3.1.2.1.2 Threat assessment parameters and scoring

The assessment parameter for inappropriate fire regimes is *potential for inappropriate fire regimes*. As presented in **Table 3.5**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

The assessment parameter for clearing of native vegetation and habitat fragmentation is *vegetation protection status*. As presented **Table 3.5**, matter areas containing non-remnant vegetation (Cat X) under the *Vegetation Management Act 1999* (VM Act) are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land*

Title Act 1994, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for habitat degradation caused by livestock grazing is *grazing intensity*. As presented in **Table 3.5**, matter areas where grazing is excluded receive the highest score. Where rotational grazing is implemented (i.e. livestock are periodically moved between paddocks to prevent overgrazing) the moderate score (7) is applied. Areas that are continuously grazed receive the lowest score (1).

The assessment parameter for predation by feral cats and foxes is *pest animal Activity Index – feral cat and fox*. The presence of pest animals within the impact and offset areas is assessed using methods outlined in the OMP, focusing on the collection of unbaited camera trap data. An Activity Index (AI) is calculated using this data and informed by methods in Jenks et al. (2011) and based on the following formula:

$$Activity\ Index\ (AI) = (\frac{Total\ number\ of\ detections}{Total\ number\ of\ trap\ hours})\ x100$$

A detection is the positive identification of one of the target species within a 20-minute interval, with a maximum of three independent detections possible per hour. For example, if the maximum number of detections were observed (3 per hour), on a single trap day (24 hours), using a single camera, the AI would be 300 (72 detections ÷ 24 hours x 100 = 300).

The scoring categories defined in **Table 3.5** have been informed by the results of the baseline pest animal monitoring event (Attexo 2025) indicating the presence of a relatively low abundance of pest animals across the impact and offset area. The baseline surveys recorded a total of seven (7) pest animals (five (5) cats, one (1) rabbit and one (1) pig) over a combined survey effort of 3,827 trap hours (i.e. 12 cameras deployed for approximately 2 weeks).

The site-specific data is compared to the scoring categories in **Table 3.5**. These scoring categories have been developed based the following assumptions:

- Total trap hours = 3,827 hours which is equivalent to 12 cameras deployed over approximately 2 weeks (note that monitoring design in the OMP should replicate the 3,827 total trap hours to ensure results are comparable over time).
- < 5 detections per event indicates sporadic and/or incidental pest activity (Score of 15).
- 5 - 9 detections per event indicates moderate pest activity (Score of 7).
- ≥ 10 detections per event indicates frequent and/or resident-level pest activity (Score of 1).

Table 3.5: Parameters and scores for assessing threats – glossy black-cockatoo

Parameter	Score		
	1	7	15
Potential for inappropriate fire regimes	No bushfire management or mitigation measures are implemented within the matter area	Bushfire management measures are implemented within the matter area, but they do not address species specific requirements	A Bushfire Management Plan, incorporating species specific fire management requirements, is actively implemented within the matter area
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Grazing intensity	Continuous grazing	Rotational grazing	Grazing excluded
Feral cat Activity Index (AI)	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306
Fox Activity Index (AI)	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306

3.1.2.2 Species mobility capacity

As a species capable of flight, the glossy black-cockatoo has a strong mobility capacity. They can move large distances as required and may undertake daily commutes of more than 14 km between roosting or nesting sites to forage (DCCEEW 2022a). Therefore, the species is not typically considered to be limited by general barrier effects. As such, the **species mobility capacity** attribute was removed from the scoring procedure of this species and score weighting was adjusted to reflect this.

3.1.3 Species stocking rate – approximate density (per ha)

Approximate density (per ha) is the only attribute within the ***species stocking rate*** indicator that requires species-specific scoring. For scoring methods relating to the remaining three attributes refer to **Section 2.5**.

3.1.3.1 Population and density data

According to the species' conservation advice (DCCEEW 2022a), the estimated population size ranges from 6,000 to 10,500 mature individuals, with 7,500 individuals used to assess the species conservation status. Precautionary estimates were also used for the area of occupancy (AOO) and extent of occurrence (EOO), at 40,000 km^2 and 470,000 km^2 respectively (DCCEEW 2022a). Population density was estimated at one mature individual per 200 ha of 'ideal habitat' (DCCEEW 2022a), which equates to 0.005 mature individuals per hectare of ideal habitat (0.5 birds per 100 ha).

3.1.3.2 Assessing approximate density

Given the uncertainty surrounding population and density data, a precautionary proxy – *absolute records* – has been applied to score the **approximate density (per ha)** attribute. This parameter is assessed using the cumulative number of individuals identified within the matter area and species-specific **context** buffer (>70,000). Including the context buffer in the assessment area reflects the species' mobility and use of adjacent habitat (see **Section 2.4.3**). Due to the highly mobile nature of this species and the consequentially large context buffer, cumulative records as opposed to records per ha provides a more realistic proxy for density scoring. Score categories for this parameter have been presented in **Table 3.6**.

Table 3.6: Approximate density scoring – glossy black-cockatoo

Parameter	Parameter measurement area	Score			
		0 (no records)	10 (low)	20 (moderate)	30 (high)
Cumulative records	Matter area plus context buffer described in **Section 2.4.3**	0	1-10	11-20	20+

3.2 Corben's long-eared bat

Corben's long-eared bat is an insectivorous microbat that inhabits a wide range of inland woodland habitats, including those dominated by eucalypts, cypress, sheoaks and *Acacia* species (DAWE 2015). In some regions, it appears to favour box–ironbark–cypress associations and is more commonly recorded in larger, contiguous areas of habitat (DAWE 2015). It is typically associated with habitats that support a defined canopy and dense understorey layers (DAWE 2015). Recent investigations by Gonsalves *et al.* (2024) also show that the species selects older areas of vegetation and generally avoids thinned areas.

It forages on a wide variety of insects, capturing prey in flight, gleaning from foliage or hunting on the ground (DAWE 2015). Roosting is primarily associated with stags or partially dead branches, particularly within ironbarks (*Eucalyptus* spp.), buloke (*Allocasuarina luehmannii*) and belah (*Casuarina cristata*) (DAWE 2015; Gonsalves *et al.* 2022). Maternity colonies, usually comprising 10 to 20 individuals, use similar roosting sites (DAWE 2015). The species appears to rely on multiple roosts, many of which are only occupied for a single night (DAWE 2015).

Corben's long-eared bat is capable of travelling considerable distances, with typical movements of about 4 km recorded between consecutive day roosts (DAWE 2015), as well as larger movements of more than 20 km per night (Gonsalves *et al.* 2024). However, little is known about its localised habitat preferences, including potential differences between foraging and roosting habitat (Gonsalves *et al.* 2024).

3.2.1 Site condition – Species Habitat Indices

3.2.1.1 Quality and availability of food and foraging habitat

This species is strongly associated with large areas of woodland habitat that support a well-formed canopy and dense understorey layers (DAWE 2015). It has also been shown to avoid thinned habitat (Gonsalves *et al.* 2024). Accordingly, the parameters selected are based on structural vegetation composition, specifically canopy cover across multiple strata: *tree canopy cover (%)* and *shrub canopy cover (%)* (**Table 3.7**). Site specific field data for this parameter is collected in accordance with Section 5.1 of the Guide (Step 6), compared to the relevant RE benchmark and scored using **Table 3.7**. Score scaling presented in **Table 3.7**, is based on Section 5.1 of the Guide (Table 2: Tree canopy cover; Shrub canopy cover), however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

Table 3.7: Quality and availability of food and foraging habitat parameters – Corben's long-eared bat

Parameter	Parameter measurement area	Score		
		1	5	10
*Tree canopy cover (%)**	100 m transect	<10% of RE benchmark	≥10 to 50% of RE benchmark	>50% of RE benchmark
*Shrub canopy cover (%)**	100 m transect	<10% of RE benchmark	≥10 to 50% of RE benchmark	>50% of RE benchmark

*See **Appendix A, Table A1** for RE benchmarks

3.2.1.2 Quality and availability of shelter

Corben's long-eared bat roosts, including colonial maternity roosts, in tree hollows or beneath decorticating bark, with a preference for large, tall trees (DAWE 2015; Gonsalves *et al.* 2022). A detailed investigation by Gonsalves *et al.* (2022) found that hollows (59.5%) and under bark (21.4%) were the most common types of roosts used by the species, together representing almost 80% of all roosts (the remaining 20% could not be verified). They also reported that roost trees were generally taller than locally available trees.

To reflect these habitat preferences, three parameters are used to measure quality and availability of shelter as presented in **Table 3.8**. The first parameter is *large tree abundance*, which serves as a proxy for the presence of hollows (Eyre *et al.* 2022). Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 2) and the number of large trees (eucalypts and non-eucalypts) recorded is compared to the RE benchmark and scored using **Table 3.8**. Score scaling for *large tree abundance* presented in **Table 3.8** is based on Section 5.1 of the Guide (Table 2: Large trees).

As the species appears to show a preference for tall hollow-bearing trees (Gonsalves *et al.* 2022), *tree canopy height* is the second parameter assessed. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 2), compared to the RE benchmark and scored using **Table 3.8**. Score scaling presented in **Table 3.8** for *tree canopy height* is based on Section 5.1 of the Guide (Table 2: Tree canopy height).

The final parameter is the *abundance of decorticating bark* which incorporates this species propensity to roost under hanging bark in addition to roosting within tree hollows. This parameter is measured as a total count of the number of trees within the 100 x 50 m plot currently (at the time of the survey) supporting decorticating bark to an extent that this microbat species could reasonably roost under it for a day without being easily detected. Some tree species may support year-round decorticating bark (e.g. *Eucalyptus camaldulensis* [river red gum]) as long strips while others may only occasionally support decorticating bark (e.g. *Callitris glaucophylla* [white cypress pine]) which can flake off

as chunks in response to changing climatic conditions. Three relative abundance categories have been developed for this parameter and are presented in **Table 3.8**, with higher abundance equating to a higher score.

Table 3.8: Quality and availability of shelter habitat parameters – Corben's long-eared bat

Parameter	Parameter measurement area	Score		
		1	5	10
*Large tree abundance (Eucalypt and non-eucalypt)**	100 x 50 m plot	0 to 50% of RE benchmark	>50 to 100% of RE benchmark	>100% of RE benchmark
*Tree canopy height**	100 x 50 m plot	<25% of RE benchmark	>25 to 70% of RE benchmark	>70% of RE benchmark
Abundance of decorticating bark	100 x 50 m plot	Rare (<5 trees per plot)	Occasional (5 to 10 trees per plot)	Common (>10 trees per plot)

*See **Appendix A, Table A1** for RE benchmarks

3.2.2 Site context

3.2.2.1 Threats

3.2.2.1.1 Summary of relevant threats

A summary of the threats identified for the Corben's long-eared bat in the species Conservation Advice (DAWE 2015) is provided in **Table 3.9**. Justifications for each threat's inclusion or exclusion in the assessment has also been provided. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified. Several key threats are considered relevant for this species and have been included in the assessment, these are habitat loss and fragmentation, reduction in hollow availability, loss of habitat and direct mortality due to bushfires, and habitat degradation caused by grazing.

Table 3.9: Summary of threats – Corben's long-eared bat

Threats	Assessment Proposed?	Justification	Assessment parameter
Habitat loss and fragmentation and reduction in hollow availability (DAWE 2015)	Yes	Based on the information presented in the species Conservation Advice (DAWE 2015), the key known threat to the Corben's long-eared bat is habitat loss and fragmentation. Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate pastoral activities, and development of CSG infrastructure. This has resulted in habitat loss and fragmentation, as well as a reduction in hollow availability, including existing mature hollow bearing trees or future potential hollow bearing trees.	*Vegetation protection status*
Loss of habitat and direct mortality due to bushfires (DAWE 2015)	Yes	Bushfires are a suspected threat to the species, particularly in uncleared habitat. The impact and offset areas contain	*Potential for inappropriate fire regimes*

Threats	Assessment Proposed?	Justification	Assessment parameter
		habitat for this species that can be impacted by bushfires.	
Habitat degradation caused by grazing (DAWE 2015)	Yes	Although this is only a suspected threat in uncleared habitat and further investigation regarding its relative impact is required, it has been included in the assessment as the impact and offset sites are in areas where habitat has been impacted by domestic livestock grazing.	*Grazing intensity*
Exposure to agrichemicals (DAWE 2015)	No	Whilst this species is insectivorous and may be prone to impacts from agricultural pesticides, the predominant land use in the region surrounding the impact and offset sites is pastoral not agricultural. The Conservation Advice also notes that additional research is needed to quantify the impact of this threat.	N/A
Predation by feral animals (DAWE 2015)	No	Predation by feral animals (including cats and foxes) has not been demonstrated for the species and the risk to the species is unknown, therefore it has been excluded from the assessment.	N/A

An assessment of the risk rating for the identified threats has been undertaken using the threat matrix (**Section 2.4.6**) and information provided in the Corben's long-eared bats Conservation Advice (DAWE 2015). A summary of the assessment including the assigned likelihood, consequence and risk rating is presented **Table 3.10**.

Table 3.10: Risk rating of the identified threats to Corben's long-eared bat

Threat	Likelihood	Consequence	Risk Rating
Habitat loss and fragmentation and reduction in hollow availability (DAWE 2015)	Almost certain	Major	Very high risk (20)
Loss of habitat and direct mortality due to bushfires (DAWE 2015)	Almost certain	Major	Very high risk (20)
Habitat degradation caused by grazing (DAWE 2015)	Almost certain	Minor	Moderate risk (10)

3.2.2.1.2 Threat assessment parameters and scoring

The assessment parameter for habitat loss and fragmentation, and reduction in hollow availability, is *vegetation protection status*. As presented in **Table 3.11**, matter areas containing non-remnant vegetation (Cat X) under the VM Act are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land Title Act 1994*, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for loss of habitat and direct mortality due to bushfires is *potential for inappropriate fire regimes*. As presented in **Table 3.11**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

The assessment parameter for habitat degradation caused by livestock grazing is *grazing intensity*. As presented in **Table 3.11**, matter areas where grazing is excluded receive the highest score. Where rotational grazing is implemented (i.e. livestock are periodically moved between paddocks to prevent overgrazing) the moderate score (7) is applied. Areas that are continuously grazed receive the lowest score (1).

Table 3.11: Parameters and scores for assessing threats – Corben's long-eared bat

Parameter	Score		
	1	7	15
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Potential for inappropriate fire regimes	No bushfire management or mitigation measures are implemented within the matter area	Bushfire management measures are implemented within the matter area, but they do not address species specific requirements	A Bushfire Management Plan, incorporating species specific fire management requirements, is actively implemented within the matter area
Grazing intensity	Continuous grazing	Rotational grazing	Grazing excluded

3.2.2.2 Species mobility capacity

As a species capable of flight, the Corben's long-eared bat has strong mobility attributes. It is known to regularly travel distances of up to 4 km each night and may travel up to 20 km in a single night when required (DAWE 2015; Gonsalves *et al.* 2024). However, a tracking investigation by Gonsalves *et al.* (2024) found that the species rarely cross cleared areas more than 2.3 km wide, typically less than 600 m, with most crossings occurring between large areas of habitat (>100 ha). Based on these data, two parameters are used to measure species mobility capacity.

The first parameter assesses potential movement restrictions due to *habitat fragmentation* within the matter area. Using GIS spatial analysis the distance between patches of remnant and regrowth vegetation within the matter area are measured and the results compared to the scores in **Table 3.12**, with score scaling based on Gonsalves *et al.* (2024).

The second parameter, *contiguous habitat area (ha),* assesses restrictions due to the size of the habitat area. Scoring assumes that the smaller areas of isolated habitat contribute to a reduction in the mobility of the species. Scores and scaling summarised in **Table 3.12** are informed by Gonsalves *et al.* (2024). Gaps between patches of suitable habitat more than 100 m are considered to be breaks in contiguous habitat.

Table 3.12: Species mobility capacity scoring – Corben's long-eared bat

Parameter	Score			
	1 (severely restricted)	4 (highly restricted)	7 (moderately restricted)	10 (minor restriction)
Habitat fragmentation (i.e. gaps between patches of remnant/regrowth vegetation)	Any gap >2,000 m	Largest gap >1,000–2,000 m	Largest gap 500–1,000 m	All gaps <500 m

Contiguous habitat area (ha)	<25	25-50	50-100	>100

3.2.3 Species stocking rate – approximate density (per ha)

This species cannot be reliably distinguished from sympatric *Nyctophilus* species (up to two other species in the southern Brigalow Belt) using echolocation calls (DAWE 2015; Gonsalves *et al.* 2024). Consequently, it is more difficult to detect than other microbat species and requires capture and biometric assessment (DAWE 2015). Detection is further constrained by seasonal distributional changes, variable (e.g. different according to sex) home range size (450 to >31,000 ha), and poorly understood local movements (DAWE 2015; Gonsalves *et al.* 2024). Due to these challenges, this attribute has not been scored for this species, and score weightings have been adjusted accordingly.

3.3 Koala

Koalas are obligate folivores, primarily feeding upon the leaves of eucalypts (the genera of *Eucalyptus*, *Corymbia* [*Blakella*], *Angophora*, *Syncarpia* and *Lophostemon*) (DCCEEW 2022b). They exhibit strong preferences for certain species depending on the region (DCCEEW 2022b). As identified by Youngentob *et al.* (2021), these regionally preferred species are referred to as locally important koala trees (LIKT). LIKTs are defined as tree species that are frequently browsed by koalas and constitute a significant proportion of the diet for local populations within each defined Koala Management Bioregion (KMB). All LIKTs recorded from within the Brigalow Belt bioregion are summarised below in **Table 3.13**.

Table 3.13: LIKT recorded in the Brigalow Belt bioregion (Youngentob *et al.* 2021).

Species			
Eucalyptus brownii	*Eucalyptus drepanophylla*	*Eucalyptus longirostrata*	*Eucalyptus orgadophila*
Eucalyptus camaldulensis	*Eucalyptus dura*	*Eucalyptus major*	*Eucalyptus populnea*
Eucalyptus chloroclada	*Eucalyptus exserta*	*Eucalyptus melanophloia*	*Eucalyptus punctata*
Eucalyptus conica	*Eucalyptus fibrosa*	*Eucalyptus microcarpa*	*Eucalyptus saligna*
Eucalyptus coolabah	*Eucalyptus laevopinea*	*Eucalyptus moluccana*	*Eucalyptus sideroxylon*
Eucalyptus crebra	*Eucalyptus largiflorens*	*Eucalyptus ochrophloia*	*Eucalyptus tereticornis*

3.3.1 Site condition – Species Habitat Indices

3.3.1.1 Quality and availability of food and foraging habitat

Due to the koala's reliance on specific LIKTs (Youngentob *et al.* 2021), the availability of these species is critical in assessing the quality of koala food and foraging habitat. Therefore, the parameter selected to score this attribute is the *availability of LIKT*. This parameter is assessed by measuring the canopy cover of LIKTs and comparing the results to benchmarks derived from RE Technical Description data (Queensland Herbarium 2018). These benchmarks were developed by calculating total LIKT tree cover values across four applicable strata: Emergent, T1 (tree canopy), T2, and T3 (tree subcanopy) for each RE present. The resulting benchmarks are presented in **Appendix A**, **Table A2**. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 6) and the total cover of LIKTs is compared to the benchmark and scored using **Table 3.14**. Scores for this parameter increase as the canopy cover of LIKTs increases. Score scaling presented in **Table 3.14** is based on Section 5.1 of the Guide (Table 2: Tree canopy cover), however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

Since koalas do not require diverse forests if available tree species provide sufficient foraging resources (Youngentob *et al.* 2021), the richness of LIKT is not included in the scoring process for this attribute.

Table 3.14: Quality and availability of food and foraging habitat parameters – koala

Parameter	Score		
	1	5	10
Availability of LIKT (using LIKT canopy cover as a proxy)*	<10% of LIKT cover benchmark	≥10 to 50% of LIKT cover benchmark	>50% of LIKT cover benchmark

*See **Appendix A, Table A2** for species specific benchmarks

3.3.1.2 Quality and availability of shelter habitat

Landscape features such as sheltered gullies, closed-canopy forests, and vegetated watercourses provide important koala refuges (DCCEEW 2022b). Although koalas regularly utilise and feed in trees across a wide range if size and age classes, there appears to be a significant relationship between their preferred tree size and the time of day, with behaviours being shifted towards larger trees during the daytime for shelter and smaller trees at night for foraging (Youngentob *et al.* 2021). In addition, koalas preferentially use larger trees, which provide stable structures during storms and aid thermoregulation during hot weather through higher transpiration rates (DCCEEW 2022b).

Based on the above, the first parameter selected to assess the quality and availability of shelter habitat for the koala is *tree canopy cover (%)*, which incorporates the canopy cover of not only larger trees, which the literature suggests is their preference for shelter, but also smaller trees that this species is known to utilise for foraging. Site specific field data for this parameter is collected in accordance with Section 5.1 of the Guide (Step 6), compared to the relevant RE benchmark and scored using **Table 3.15**. Score scaling presented in **Table 3.15** is based on Section 5.1 of the Guide (Table 2: Tree canopy cover), however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

The second parameter selected to assess the quality and availability of koala shelter habitat is *number of large trees (eucalypt and non-eucalypt)*. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 2) and the number of large trees recorded is compared to the RE benchmark and scored using **Table 3.15**. Score scaling presented in **Table 3.15** was informed by Section 5.1 of the Guide (Table 2: Large trees).

Table 3.15: Quality and availability of shelter habitat parameters – koala

Parameter	Parameter measurement area	Score		
		1	5	10
*Tree canopy cover (%)**	100 m transect	<10% of RE benchmark	≥10 to 50% of RE benchmark	>50% of RE benchmark
*Number of large trees (eucalypt and non-eucalypt)**	100 x 50 m plot	0 to 50% of RE benchmark for large eucalypt trees	>50 to 100% of RE benchmark for large eucalypt trees	>100% of RE benchmark for large eucalypt trees

*See **Appendix A, Table A1** for RE benchmarks

3.3.2 Site context

3.3.2.1 Threats

3.3.2.1.1 Summary of relevant threats

A summary of the threats identified for koala in the species Conservation Advice (DCCEEW 2022b), Recovery Plan (DAWE 2022) and the Threat abatement plan for predation by feral cats (DCCEEW 2024) has been provided in **Table 3.16**. Justifications for each threat's inclusion or exclusion in the threat assessment has also been provided. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified.

Several key threats are considered relevant for this species and have been included in the assessment, these are altered fire regimes including prescribed burns, clearing and degradation of koala habitat, habitat loss and

fragmentation, encounter mortality with vehicles and encounter mortality with dogs. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified. Risk ratings have been assigned for each threat based on the risk assessment in the species Conservation Advice (DCCEEW 2022b).

Table 3.16: Summary of threats - koala

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk rating
Altered fire regimes including prescribed burning (DAWE 2022)	Yes	The impact and offset areas contain habitat for this species that may be impacted by inappropriate fire regimes.	*Potential for inappropriate fire regimes*	Very high risk (20)
Clearing and degradation of koala habitat, habitat loss and fragmentation (DCCEEW 2022b; DAWE 2022)	Yes	Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate pastoral activities and the development of CSG infrastructure.	*Vegetation protection status*	Very high risk (25)
Encounter mortality with vehicles (DCCEEW 2022b)	Yes	Interactions with vehicles within the impact and offset areas is likely a minor potential threat and will be managed through site access restrictions and speed. However, it has been included in the assessment as a precautionary approach.	*Vehicle strike*	Very high risk (10)
Encounter mortality with dogs (DCCEEW 2022b; DAWE 2022)	Yes	Attacks by domestic or wild dogs has been included in the assessment as a precautionary approach as dogs are likely to be present at the impact and offset sites.	*Pest animal Activity Index – dog*	Very high risk (10)
Predation by feral cats (DCCEEW 2024)	No	Whilst the conservation advice (DCCEEW 2022b) for the Koala lists predation by feral cats as a potential threatening process, the threat abatement plan for predation by feral cats (DCCEEW 2024) states that the susceptibility of this species to cats is low. This threatening process has therefore been excluded from this assessment.	N/A	N/A

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk rating
Climate Change – loss of climatically suitable habitat, increased intensity/frequency of drought and increased intensity and frequency of heatwaves and bushfire (DCCEEW 2022b; DAWE 2022)	No	Loss of climatically suitable habitat as a result of climate change driven processes and drivers is a known risk to the species and may outpace habitat losses from land use change in the next 10 years. As climate change is a broad scale ecological threat, and is generally considered consistent between the impact and offset site, it has been excluded from the threat assessment.	N/A	N/A
Declining nutritional value of foliage (DCCEEW 2022b)	No	Additional research is required to assess how elevated levels of CO_2 affect nitrogen and available nitrogen (which integrates the effects of tannins). As declining nutritional value is a broader scale ecological threat, and is generally considered consistent between the impact and offset site, it has been excluded from the threat assessment.	N/A	N/A
Disease (DCCEEW 2022b; DAWE 2022)	No	Koala populations are known to be impacted by Koala Retrovirus (KoRV) and Chlamydia (*Chlamydia percorum*). Assessing and managing the threat of disease in koala populations is beyond the scope of the offset management plan and therefore it is not included in the threat assessment.	N/A	N/A
Genetic effects (DAWE 2022)	No	Whilst koala populations are under threat from habitat loss, high levels of genetic diversity exist within these populations (DAWE 2022). Further research is needed to determine whether there is any loss of genetic	N/A	N/A

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk rating
		diversity due to habitat loss. This potential threat has not been included in the threat assessment.		

3.3.2.1.2 Threat assessment parameters and scoring

The assessment parameter for altered fire regimes is *potential for inappropriate fire regimes*. As presented in **Table 3.17**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

The assessment parameter for clearing and degradation of koala habitat/habitat loss and fragmentation is *vegetation protection status*. As presented in **Table 3.17**, matter areas containing non-remnant vegetation (Cat X) under the VM Act are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land Title Act 1994*, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for encounter mortality with vehicles is *vehicle strikes*. The *vehicle strike* parameter presented in **Table 3.17** uses vehicle track classifications as a proxy to estimate the predicted mortality risk based on likely vehicle speeds.

The assessment parameter for predation by feral dog is *pest animal Activity Index – dog*. The presence of pest animals within the impact and offset areas is assessed using methods outlined in the OMP, focusing on the collection of unbaited camera trap data. An Activity Index (AI) is calculated using this data and informed by methods in Jenks et al. (2011) and based on the following formula:

$$Activity\ Index\ (AI) = (\frac{Total\ number\ of\ detections}{Total\ number\ of\ trap\ hours})\ x100$$

A detection is the positive identification of one of the target species within a 20-minute interval, with a maximum of three independent detections possible per hour. For example, if the maximum number of detections were observed (3 per hour), on a single trap day (24 hours), using a single camera, the AI would be 300 (72 detections ÷ 24 hours x 100 = 300).

The scoring categories defined in **Table 3.17** have been informed by the results of the baseline pest animal monitoring event (Attexo 2025) indicating the presence of a relatively low abundance of pest animals across the impact and offset area. The baseline surveys recorded a total of seven (7) pest animals (five (5) cats, one (1) rabbit and one (1) pig) over a combined survey effort of 3,827 trap hours (i.e. 12 cameras deployed for approximately 2 weeks).

The site-specific data is compared to the scoring categories in **Table 3.17**. These scoring categories have been developed based the following assumptions:

- Total trap hours = 3,827 hours which is equivalent to 12 cameras deployed over approximately 2 weeks (note that monitoring design in the OMP should replicate the 3,827 total trap hours to ensure results are comparable over time).
- < 5 detections per event indicates sporadic and/or incidental pest activity (Score of 15).
- 5 - 9 detections per event indicates moderate pest activity (Score of 7).
- ≥ 10 detections per event indicates frequent and/or resident-level pest activity (Score of 1).

Table 3.17: Parameters and scores for assessing threats – koala

Parameter	Score		
	1	7	15
Potential for inappropriate fire regimes	No bushfire management or mitigation measures are implemented within the matter area	Bushfire management measures are implemented within the matter area, but they do not address species specific requirements	A Bushfire Management Plan, incorporating species specific fire management requirements, is actively implemented within the matter area
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Vehicle strike	High risk of mortality from vehicle strike: Maintained gravel or sealed roads (proxy for regular vehicle speeds of up to 70 km/h) within the site	Moderate risk of mortality from vehicle strike: Unmaintained tracks e.g. farm tracks (proxy for regular vehicle speeds of up to 50 km/h) within the site	Low risk of mortality from vehicle strike: No vehicle formed tracks associated within the site or maximum mandated speeds of 40 km/h
Pest animal Activity Index – dog	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306

3.3.2.2 Species mobility capacity

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

During such movements, koalas prefer natural, undisturbed, and contiguous habitats. On the ground, their movement can be impeded by barriers such as fences, buildings, water bodies or other structures, as well as threats such as predation by feral or domestic animals (Beale *et al.* 2022). Dense infestations of weeds such as lantana may also impede movement.

Based on these factors, two parameters have been selected to assess koala mobility capacity – *presence of koala friendly fences* and *average lantana cover*. Predation by dogs has not been included as this threat is already assessed as part of the threat assessment presented in **Table 3.17**.

Presence of koala friendly fences is assessed across the entire matter area and is scored using the score scales presented in **Table 3.18**, with only two score scales proposed (severely restricted or minor restriction). Koala friendly fences must not prevent the movement of koalas between the offset property and directly connected habitats nor within the offset property itself. Fencing at the impact and offset area should be assessed in accordance with the Queensland Government's *Koala-Sensitive Design Guideline - A guide to koala-sensitive design measures for planning and development activities*[3] (DES 2022). An example of a severely restrictive fence that is not conducive to the movement of koalas may include:

- A wild dog barrier fence or any other high density fence that koalas cannot climb through or would struggle to climb over (i.e. without koala movement structures)

[3] https://www.detsi.qld.gov.au/_global/policy-register/policy-register-pdf?getdoc=5154&name=koala-sensitive-design-guideline.pdf

- A multistring barbed wire fence line that may inhibit or deter the movement of koalas

A koala friendly fence line should meet the requirements of the Queensland Government's *Koala-Sensitive Design Guideline - A guide to koala-sensitive design measures for planning and development activities*[3] (DES 2022).

Average lantana cover is assessed by undertaking weed cover surveys in accordance with the method outlined in the OMP. The average cover (%) is determined (all sites combined) and is scored using the score scales presented in **Table 3.18**, which were informed by Section 5.1 of the Guide (Table 2: Non-native plant cover).

Table 3.18: Species mobility capacity parameters – koala

Parameter	Score			
	1 (severely restricted)	4 (highly restricted)	7 (moderately restricted)	10 (minor restriction)
Presence of koala friendly fences	Not all fences within and bordering the matter area are koala-friendly fence	-	-	All fences within and bordering the matter area are koala-friendly fences
Average lantana cover (across all survey sites)	>50%	>25–50%	>5–25%	<5%

3.3.3 Species stocking rate – approximate density (per ha)

Approximate density (per ha) is the only attribute within the ***species stocking rate*** indicator that requires species-specific scoring. For scoring methods relating to the remaining three attributes refer to **Section 2.5**.

3.3.3.1 Population and density data

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

State-wide estimates of population size remain limited, with survey effort and available data concentrated in south-east Queensland (DCCEEW 2022b). In response to this limitation and the lack of peer-reviewed estimates of koala numbers noted in earlier listing assessments, an expert elicitation exercise was undertaken in 2012 (DCCEEW 2022b). The results of this exercise are now widely recognised as the most robust baseline for koala population estimates across Queensland's bioregions and form the reference point for the current Conservation Advice. Based on this exercise, it was estimated that there were approximately 79,264 koalas in Queensland in 2012, distributed across eight bioregions. The highest population estimates were for Brigalow Belt North, Mulga Lands, and South East Queensland, with koalas also present in Central Mackay Coast, Desert Uplands, Einasleigh Uplands and Wet Tropics, Mitchell Grass Downs, and South Brigalow. These eight bioregions together cover a total area of 1,489,650 km^2 (148,965,000 ha), equating to a mean density of approximately 0.0005 koalas per hectare. Low-density populations are particularly characteristic of regions west of the Great Dividing Range (GDR), and this trend is even more pronounced in semi-arid environments.

3.3.3.2 Assessing approximate density

Given the uncertainty surrounding population and density data, a precautionary proxy parameter - *number of records per 100 ha* - has been applied to score the **approximate density (per ha)** attribute. This parameter is assessed using the total number of species records within the matter area and species-specific **context** buffer (>31,000 ha) (see **Section 2.4.3**). Including the context buffer in the assessment area reflects the species' mobility and use of adjacent

habitat. Only those species records observed after the year 2000 have been incorporated into this calculation. These observations are thought to be representative of the species current distribution and where they are more likely to occur. Under this approach, sites with higher numbers of records are precautionarily assumed to represent greater relative value to the species.

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

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

This parameter is then assigned a score following **Table 3.19**. Score scaling is informed by the state's mean density of 0.05 koalas per 100 ha whereby ≥1 record per 100 ha will generate the low score. As the impact and offset area lies well west of the GDR, the use of the state's mean density is considered conservative.

Table 3.19: Approximate density scoring – koala

Parameter	Parameter measurement area	Score			
		0 (no records)	10 (low)	20 (moderate)	30 (high)
Number of records per 100 ha	Matter area plus context buffer described in **Section 2.4.3**	0	≥1-2	≥2-5	>5

3.4 Diamond firetail

The diamond firetail is primarily a woodland bird, typically occurring in habitats dominated by eucalypt, *Acacia* or *Casuarina*. It prefers open areas with a low density of scattered canopy trees, including altered landscapes such as farmland and roadsides (DCCEEW 2023a). Within these habitats, the species strongly favours areas with dense grass cover, as seeds from a variety of native grasses form the bulk of its diet (DCCEEW 2023a). Diamond firetails are predominately low-level foragers and are frequently observed on the ground (DCCEEW 2023a).

The species is largely sedentary, although some localised movements may occur in response to seasonal conditions (DCCEEW 2023a). For roosting, they utilise dense shrubs and may construct dedicated roosting nests. For breeding, they build a distinctive bottle-shaped nest out of grasses (DCCEEW 2023a). These nests are often situated within or at the base of large stick nests constructed by birds of prey, though they may also nest in dense shrubs or small trees that provide spiny foliage or fine branches offering protection from predators (DCCEEW 2023a).

3.4.1 Site condition – Species Habitat Indices

3.4.1.1 Quality and availability of food and foraging habitat

This species is highly reliant on the presence and availability of native grass seeds, which form the bulk of its diet (DCCEEW 2023). Accordingly, both parameters selected to assess the quality and availability of food and foraging habitat relate to grass availability.

The first parameter assessed is *native grass richness*, considered a suitable proxy for seasonal grass seed availability. Greater species richness is likely to reflect a wider range of reproductive strategies and phenologies, thereby supporting more continuous seed availability throughout the year. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 3), compared to the relevant RE benchmark and scored using **Table 3.20**. Score scaling presented in **Table 3.20** is based on Section 5.1 of the Guide (Table 2: Native plant species richness - grasses).

The second parameter assessed is *native grass cover*, used as a proxy for general resource abundance - more grass is assumed to correlate with higher seed yield. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 5), compared to the relevant RE benchmark and scored using **Table 3.20**. Score scaling presented in **Table 3.20** is based on Section 5.1 of the Guide (Table 2: Native perennial grass cover).

Table 3.20: Quality and availability of food and foraging habitat parameters – diamond firetail

Parameter	Parameter measurement area	Score		
		1	5	10
*Native grass richness**	50 x 10 m plot	<25% of RE benchmark	≥25% to 90% of RE benchmark	>90 of RE benchmark
*Native grass cover (%)**	1 x 1 m plots	0 to 50% of RE benchmark	>50% to 90% of RE benchmark	>90% of RE benchmark

*See **Appendix A, Table A1** for RE benchmarks

3.4.1.2 Quality and availability of shelter

The species typically nest within or at the base of large stick nests constructed by birds of prey, though they may also roost in dense shrubs or small trees that provide spiny foliage or fine branches offering protection from predators (DCCEEW 2023a). Accordingly, the parameters selected to assess the quality and availability of shelter for diamond firetail are based on structural vegetation composition, specifically cover densities across multiple strata: *tree canopy cover (%)* and *shrub canopy cover (%)*. These parameters serve as a proxy for both breeding and sheltering (e.g. roosting) opportunities. Areas with higher tree or shrub canopy cover are considered more likely to provide suitable sites for these behaviours.

To assess these parameters, site specific field data is collected in accordance with Section 5.1 of the Guide (Step 6), compared to the relevant RE benchmark and scored using **Table 3.21**. Score scaling presented in **Table 3.21** is based on Section 5.1 of the Guide (Table 2: Tree canopy over and Shrub canopy cover), however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

Table 3.21: Quality and availability of shelter habitat parameters – diamond firetail

Parameter	Parameter measurement area	Score		
		1	5	10
*Shrub canopy cover (%)**	100 m transect	<10% of RE benchmark	≥10 to 50% of RE benchmark	>50% of RE benchmark
*Tree canopy cover (%)**	100 m transect	<10% of RE benchmark	≥10 to 50% of RE benchmark	>50% of RE benchmark

* See **Appendix A, Table A1** for RE benchmarks

3.4.2 Site context

3.4.2.1 Threats

3.4.2.1.1 Summary of relevant threats

A summary of the threats identified for the diamond firetail in the species Conservation Advice (DCCEEW 2023a) and the Threat abatement plan for predation by feral cats (DCCEEW 2024) is provided in **Table 3.22**. Justifications for each threat's inclusion or exclusion in the threat assessment has also been provided.

Several key threats are considered relevant for this species and have been included in the assessment, these are habitat loss caused by land clearing, invasive weeds, habitat degradation caused by livestock grazing, increase in frequency and scale or intensity of fire. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified. Risk ratings have been assigned for each threat based on the risk assessment in the species Conservation Advice (DCCEEW 2023a).

Table 3.22: Summary of threats – diamond firetail

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk rating
Habitat loss caused by land clearing (DCCEEW 2023a)	Yes	Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate pastoral activities and the development of CSG infrastructure.	*Vegetation protection status*	Very high risk (20)
Invasive weeds (particularly exotic annual grasses) (DCCEEW 2023a)	Yes	Invasive weeds within the impact and offset areas can change the floristic and structural characteristics of habitat and consequently alter resource availability for the species, as well as potentially increasing bushfire risk.	*Average non-native plant cover*	Very high risk (20)
Habitat degradation caused by livestock grazing (DCCEEW 2023a)	Yes	The impact and offset sites are in areas where habitat has been impacted by domestic livestock grazing.	*Grazing intensity*	Very high risk (20)
Increase in frequency, scale or intensity of fire (DCCEEW 2023a)	Yes	The impact and offset areas contain habitat for this species that may be impacted by inappropriate fire regimes.	*Potential for inappropriate fire regimes*	Moderate risk (3)
Predation by feral cats (DCCEEW 2024)	No	Whilst the conservation advice (DCCEEW 2023a) for the diamond firetail lists predation by feral cats as a potential threatening process, the threat abatement plan for predation by feral cats (DCCEEW 2024) states that the susceptibility of this species to cats is low. This threatening process has therefore been excluded from this assessment.	N/A	N/A
Habitat degradation by rabbits (DCCEEW 2023a)	No	As listed in the Conservation Advice (DCCEEW 2023) the confidence in this threat for diamond firetail is low, therefore it has not been included in the threat assessment.	N/A	N/A
Climate Change – increased likelihood of extreme events (DCCEEW 2023a)	No	Climate change will increase and continue to increase the likelihood of extreme events such as wildfires, heatwaves, and droughts, adversely impacting habitat and resource availability, and overwhelming birds physiological limits. As climate change is a broad scale ecological threat, and is generally considered	N/A	N/A

Threats	Assessment Proposed?	Justification	Assessment parameter	Risk rating
		consistent between the impact and offset site, it has been excluded from the threat assessment.		
Territorial competition with noisy miners and predation by pied currawongs (DCCEEW 2023a)	No	Two native species (noisy miner *Manorina melanocephala* and Pied currawong *Strepera graculina*) are listed as threatening process for the diamond firetail. Impacts from native species have not been included in the threat assessment as control of these native species is beyond the scope of the OMP.	N/A	N/A

3.4.2.1.2 Threat assessment parameters and scoring

The assessment parameter for habitat loss caused by land clearing is *vegetation protection status*. As presented in **Table 3.23**, matter areas containing non-remnant vegetation (Cat X) under the VM Act are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land Title Act 1994*, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for invasive weeds is *average non-native plant cover*. Non-native plant cover is assessed in accordance with Section 5.1 of the Guide (Step 3) at each assessment site individually and then the average across all assessment sites is determined to define a single cover score for the entire matter area. The average cover is then compared to the score scales presented in **Table 3.23**, which are based on Section 5.1 of the Guide (Table 2: Non-native plant cover).

The assessment parameter for habitat degradation caused by livestock grazing is *grazing intensity*. As presented in **Table 3.23**, matter areas where grazing is excluded receive the highest score. Where rotational grazing is implemented (i.e. livestock are periodically moved between paddocks to prevent overgrazing) the moderate score (7) is applied. Areas that are continuously grazed receive the lowest score (1).

The assessment parameter for inappropriate fire regimes is *potential for inappropriate fire regimes*. As presented in **Table 3.23**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

Table 3.23: Parameters and scores for assessing threats – diamond firetail

Parameter	Score		
	1	7	15
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Average non-native plant cover (%)	>50% average cover	5-50% average cover	<5% average cover
Grazing intensity	Continuous grazing	Rotational grazing	Grazing excluded

Parameter	Score		
	1	7	15
Potential for intense bushfires	No bushfire management or mitigation measures are implemented within the matter area	Bushfire management measures are implemented within the matter area, but they do not address species specific requirements	A Bushfire Management Plan, incorporating species specific fire management requirements, is actively implemented within the matter area

3.4.2.2 Species mobility capacity

Whilst described as sedentary, some populations are known to move locally between areas of suitable habitat (DCCEEW 2023a). Their flights are described as low and direct in long lines with slight undulations and as such are considered to have a strong mobility capacity. Considering the lack of physical barriers that could impede the movement of this species throughout the surrounding landscape, the species mobility capacity attribute has been removed from the scoring procedure for this species and score weightings have been adjusted accordingly.

3.4.3 Species stocking rate – approximate density (per ha)

Approximate density (per ha) is the only attribute within the ***species stocking rate*** indicator that requires species-specific scoring. For scoring methods relating to the remaining three attributes refer to **Section 2.5**.

3.4.3.1 Population and density data

According to the species' Conservation Advice (DCCEEW 2023a), the current population of the diamond firetail is estimated at 68,000 mature individuals, with a broad range from 68,000 to 272,000. However, the reliability of this estimate is considered to be very low (DCCEEW 2023a). The estimate is based on the species' area of occupancy (AOO) and bird densities recorded during 20-minute, 2 ha area-search surveys (DCCEEW 2023a).

Population size was calculated by multiplying the AOO by an average density of 1.36 birds per hectare (2.72 birds per 2 ha survey, ±2.99 SD), based on BirdLife Australia survey data, with each 2x2 km AOO grid cell assumed to contain 16 ha of suitable habitat (DCCEEW 2023a). This estimate is highly conservative and relies on several key assumptions: that not all occupied areas have been recorded; that at least 4 ha of habitat exists in each grid cell with a record; and that some cells may be only partially occupied (DCCEEW 2023a). Additionally, the number of individuals recorded during surveys is highly variable, and some records may no longer represent currently occupied habitat (DCCEEW 2023a).

3.4.3.2 Assessing approximate density

Due to the uncertainties in both population size and density, a precautionary proxy parameter - *number of records per 100 ha* - has been applied to score the **approximate density (per ha)** attribute. This measure is based on the total number of species records within the matter area and species-specific **context** buffer (>300 ha). Including the context buffer in the assessment area reflects the species' mobility and use of adjacent habitat (see **Section 2.4.3**). Only those species records observed after the year 2000 have been incorporated into this calculation. These observations are thought to be representative of the species current distribution and where they are more likely to occur. Under this approach, sites with higher numbers of records are precautionarily assumed to represent greater relative value to the species.

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

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

This parameter is then assigned a score following **Table 3.24**. Score scaling is deliberately conservative and informed by the national density estimate of 136 birds per 100 ha. The highest score is assigned where more than 100 records per 100 ha over the five-year period is recorded.

Table 3.24: Approximate density scoring – diamond firetail

Parameter	Parameter measurement area	Score			
		0 (no records)	10 (low)	20 (moderate)	30 (high)
Number of records per 100 ha	Matter area plus context buffer described in **Section 2.4.3**	0	>0-50	>50-100	>100

3.5 Dunmall's Snake

The Dunmall's snake is a venomous snake in the Elapidae family. It is primarily nocturnal, docile and terrestrial, typically occurring in habitats associated with black cracking clays dominated by *Acacia*, *Callitris* or *Allocasuarina* species. It can also occur on sandstone derived soils dominated by *Eucalyptus*, *Corymbia*, *Callitris* and *Allocasuarina* (DoE 2026b). Whilst little is known about the ecological requirements of this cryptic species, they are known to shelter under fallen timber, ground litter and within cracks in alluvial clay soils (DoE 2026b, DoE 2014) and possibly prefer habitats between 200 and 500 m above sea level (DoE 2026b).

Given the species' need to shelter during seasonally hot and dry conditions, the species is restricted to areas supporting microhabitat features and is considered largely sedentary, although some localised movement may occur in response to seasonal conditions (DoE 2026b). The diet of Dunmall's snake primarily consists of small skinks and geckos (DoE 2014, DoE 2026b) with one specimen's stomach contents containing remnants of the tree skink (*Egernia striolata*) (Shine 1981).

3.5.1 Site condition – Species Habitat Indices

3.5.1.1 Quality and availability of food and foraging habitat

The diet of Dunmall's snake primarily consists of small skinks and geckos (DoE 2014, DoE 2026b). It is well documented that structural complexity of vegetation and other ground-level microhabitat components are important to skinks (Downey and Dickman 1993, Hutchinson 1993), legless lizards (Rauhala 1993), geckos (Smith et al. 1996) and elapid snakes (Shine 1987, Greer 1997). Reptile species richness and abundance increases with greater structural heterogeneity in the ground and shrub layer, particularly generalist skink species (Brown et al. 2008). Accordingly, the two parameters selected to assess the quality and availability of food and foraging habitat are *native grass cover (%)* and *shrub cover (%)*.

The first parameter assessed is *native grass cover (%)*. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 5), compared to the relevant RE benchmark and scored using **Table 3.25**. Score scaling presented in **Table 3.25** is based on Section 5.1 of the Guide (Table 2: Native perennial grass cover).

The second parameter assessed is *shrub cover (%)*. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 6), compared to the relevant RE benchmark and scored using **Table 3.25**. Score scaling presented in **Table 3.25** is based on Section 5.1 of the Guide (Table 2: Shrub canopy cover).

Table 3.25 Quality and availability of food and foraging habitat parameters - Dunmall's snake

Parameter	Parameter measurement area	Score		
		1	5	10
*Native grass cover (%)**	1 x 1 m plots	<10% of RE benchmark	≥10% and <50% of RE benchmark	>50% of RE benchmark

*Shrub canopy cover**	100 m transect	<10% of RE benchmark	≥10% and <50% of RE benchmark	>50% of RE benchmark

*See **Appendix A, Table A1** for RE benchmarks

3.5.1.2 Quality and availability of shelter

The species is found almost exclusively under fallen timber and ground litter but may also use cracks in clay soils (DoE 2014, DCCEEW 2026b), as well as rocks or artificial materials on or within topsoil (DCCEEW 2023b). Accordingly, the parameters selected to assess the quality and availability of shelter for Dunmall's snake are availability of *coarse woody debris* and *organic litter*. The presence and availability of these serve as a proxy for sheltering opportunities.

To assess *coarse woody debris*, site specific field data is collected in accordance with Section 5.1 of the Guide (Step 4), compared to the relevant RE benchmark and scored in accordance with **Table 3.26**. Score scaling presented in **Table 3.26** is based on Section 5.1 of the Guide (Table 2: Coarse woody debris) however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

To assess *organic litter*, site specific field data is collected in accordance with Section 5.1 of the Guide (Step 5), compared to the relevant RE benchmark and scored in accordance with **Table 3.26**. Score scaling presented in **Table 3.26** is based on Section 5.1 of the Guide (Table 2: Organic litter) however, excludes scoring references to cover over 200% as it is not considered relevant for this assessment.

Table 3.26 Quality and availability of shelter habitat parameters - Dunmall's snake

Parameter	Parameter measurement area	Score		
		1	5	10
*Coarse woody debris**	1 x 1 m plots	<10% of RE benchmark	≥10% - <50% of RE benchmark	>50% of RE benchmark
*Organic litter**	1 x 1 m plots	<10% of RE benchmark	≥10% - <50% of RE benchmark	>50% of RE benchmark

*See **Appendix A, Table A1** for RE benchmarks

3.5.2 Site context

3.5.2.1 Threats

3.5.2.1.1 Summary of relevant threats

A summary of the threats identified for the Dunmall's snake in the species Conservation Advice (DoE 2014), species profile (DoE 2026b), draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW 2023b) and the Threat abatement plan for predation by feral cats 2024 (DCCEEW 2024) is provided in **Table 3.27**. Justifications for each threat's inclusion or exclusion in the threat assessment has also been provided. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified.

Several key threats are considered relevant for this species and have been included in the assessment, these are habitat loss and fragmentation, habitat degradation caused by livestock grazing, inappropriate fire regimes, predation by feral animals and invasive weeds.

Table 3.27 Summary of threats - Dunmall's snake

Threats	Assessment Proposed?	Justification	Assessment parameter
Habitat loss and fragmentation (DoE 2014,	Yes	Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate grazing	*Vegetation protection status*

Threats	Assessment Proposed?	Justification	Assessment parameter
DoE 2026b, DCCEEW 2023b)		and agriculture, as well as CSG development.	
Habitat degradation caused by livestock grazing (DoE 2014, DoE 2026b, DCCEEW 2023b)	Yes	The impact and offset sites are in areas where habitat has been impacted by domestic livestock grazing.	*Grazing intensity*
Inappropriate fire regimes (DCCEEW 2023b)	Yes	The species utilises fallen timber and ground litter for shelter and foraging. The impact and offset areas contain habitat for this species that may be impacted by inappropriate fire regimes which can result in the loss of fallen timber and ground litter.	*Potential for inappropriate fire regimes*
Predation by feral animals (DCCEEW 2024)	Yes	The Threat abatement plan for predation by feral cats 2024 is adopted for this species and predation by feral cats to the threatened Brigalow Belt reptiles is referenced in the draft referral guidelines (DCCEEW 2023b). The presence of feral cats at the impact and offset sites is likely hence this threat has been included in the assessment.	*Pest animal Activity Index – feral cat*
Invasive weeds (DCCEEW 2023b)	Yes	Habitat degradation caused by invasive weeds is an indirect threat to the species and has been included in the threat assessment.	*Average non-native plant cover*

An assessment of the risk rating for the identified threats has been undertaken using the threat matrix (**Section 2.4.6**) and information provided in the conservation advice (DoE 2014) and threat abatement plan for predation by feral cats (DCCEEW 2024). A summary of the assessment including the assigned likelihood, consequence and risk rating is presented **Table 3.28**.

Table 3.28: Risk rating of the identified threats to Dunmall's snake

Threat	Likelihood	Consequence	Risk rating
Habitat loss and fragmentation (DoE 2014, DoE 2026b, DCCEEW 2023b)	Almost certain	Major	Very high risk (20)
Habitat degradation caused by livestock grazing (DoE 2014, DoE 2026b, DCCEEW 2023b)	Almost certain	Moderate	Very high risk (15)
Inappropriate fire regimes (DCCEEW 2023b)	Likely	Moderate	High risk (12)
Predation by feral animals (DCCEEW 2024)	Likely	Minor	Moderate risk (8)

Threat	Likelihood	Consequence	Risk rating
Invasive weeds (DCCEEW 2023b)	Almost certain	Minor	Moderate risk (10)

3.5.2.1.2 Threat assessment parameters and scoring

The assessment parameter for habitat loss caused by land clearing and habitat modification is *vegetation protection status*. As presented in **Table 3.29**, matter areas containing non-remnant vegetation (Cat X) under the VM Act are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land Title Act 1994*, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for habitat degradation caused by livestock grazing is *grazing intensity*. As presented in **Table 3.29**, matter areas where grazing is excluded receive the highest score. Where rotational grazing is implemented (i.e. livestock are periodically moved between paddocks to prevent overgrazing) the moderate score (7) is applied. Areas that are continuously grazed receive the lowest score (1).

The assessment parameter for inappropriate fire regimes is *potential for inappropriate fire regimes*. As presented in **Table 3.29**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

The assessment parameter for predation by feral cat is *pest animal Activity Index – feral cat*. The presence of pest animals within the impact and offset areas is assessed using methods outlined in the OMP, focusing on the collection of unbaited camera trap data. An Activity Index (AI) is calculated using this data and informed by methods in Jenks et al. (2011) and based on the following formula:

$$Activity\ Index\ (AI) = (\frac{Total\ number\ of\ detections}{Total\ number\ of\ trap\ hours})\ x100$$

A detection is the positive identification of one of the target species within a 20-minute interval, with a maximum of three independent detections possible per hour. For example, if the maximum number of detections were observed (3 per hour), on a single trap day (24 hours), using a single camera, the AI would be 300 (72 detections ÷ 24 hours x 100 = 300).

The scoring categories defined in **Table 3.29** have been informed by the results of the baseline pest animal monitoring event (Attexo 2025) indicating the presence of a relatively low abundance of pest animals across the impact and offset area. The baseline surveys recorded a total of seven (7) pest animals (five (5) cats, one (1) rabbit and one (1) pig) over a combined survey effort of 3,827 trap hours (i.e. 12 cameras deployed for approximately 2 weeks).

The site-specific data is compared to the scoring categories in **Table 3.29**. These scoring categories have been developed based the following assumptions:

- Total trap hours = 3,827 hours which is equivalent to 12 cameras deployed over approximately 2 weeks (note that monitoring design in the OMP should replicate the 3,827 total trap hours to ensure results are comparable over time).
- < 5 detections per event indicates sporadic and/or incidental pest activity (Score of 15).
- 5 - 9 detections per event indicates moderate pest activity (Score of 7).
- ≥ 10 detections per event indicates frequent and/or resident-level pest activity (Score of 1).

The assessment parameter for *invasive weeds* is average non-native plant cover. Non-native plant cover is assessed in accordance with Section 5.1 of the Guide (Step 3) at each assessment site individually and then the average across all assessment sites is determined to define a single cover score for the entire matter area. The average cover is then

compared to the score scales presented in **Table 3.29**, which are based on Section 5.1 of the Guide (Table 2: Non-native plant cover).

Table 3.29 Parameters and scores for assessing threats - Dunmall's snake

Parameter	Score		
	1	7	15
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Grazing intensity	Continuous grazing	Rotational grazing	Grazing excluded
Potential for intense bushfires	No bushfire management or mitigation measures are implemented within the matter area	Bushfire management measures are implemented within the matter area, but they do not address species specific requirements	A Bushfire Management Plan, incorporating species specific fire management requirements, is actively implemented within the matter area
Pest animal Activity Index – feral cat	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306
Average non-native plant cover (%)	>50% average cover	5-50% average cover	<5% average cover

3.5.2.2 Species mobility capacity

Very little is known about the home range, dispersal activity and movement patterns of Dunmall's snake (DoE 2026b). However, the spatial ecology of Australian elapids that are similar in size and share habitat characteristics with Dunmall's snake (i.e. prey on small vertebrates including geckos and skinks and shelter under rocks and logs), has been well documented (Shine 1987, Macartney et al. 1988, Webb and Shine 1997, Whittaker and Shine 2003). Movement patterns of similar Australian elapids are limited naturally, with daily, monthly and even yearly movements between 3-300 m reported (Shine 1987, Webb and Shine 1997, Whittaker and Shine 2003). Typical movements of broad-headed snake (*Holocephalus bungaroides*), which is a smaller elapid that is closer in size and ecology to Dunmall's snake, rarely moved with average distances moved per month <200 m (Webb and Shine 1997).

Barriers to movement for smaller elapid species are likely attributed to fragmentation of suitable habitat and inherently increased habitat degradation from edge effects (DCCEEW 2023b). In vegetated habitats, broad-headed snakes moved significantly further (mean distance moved 159 m) between shelter sites compared to non-vegetated areas (mean distance moved 37 m) (Webb and Shine 1997). As threats are more prevalent in unvegetated areas and movement of smaller elapid species is inhibited in these environments, fragmentation is likely to limit the mobility capacity in Dunmall's snake. As such, *habitat fragmentation* has been selected as the only parameter to measure the species mobility capacity.

Score scaling was developed based on the range of recorded daily movement distances of broad-headed snake as the species is similar in size and ecological requirements as Dunmall's snake (i.e. both forage for geckos and skinks). As such, the minimum width between fragmented areas of habitat the species is likely to traverse is assumed to be <20 m. This assumes that the species mobility capacity would be restricted to some degree in areas where the width between habitat is more than 20 m. As presented in **Table 3.30**, a width of <20 m represents the maximum score (10), with scores decreasing in increments.

Using GIS spatial analysis, the distance between patches of all remnant and regrowth vegetation within the matter area are measured and the results compared to the scores in **Table 3.30**.

Table 3.30 Species mobility capacity parameter - Dunmall's snake

Parameter	Score			
	1 (severely restricted)	4 (highly restricted)	7 (moderately restricted)	10 (minor restriction)
Habitat fragmentation (m) (i.e. distance between patches of remnant/regrowth vegetation)	Any gap is >50m	Largest gap is 40 to 50m	Largest gap is 20 to 40m	All gaps are <20m

3.5.3 Species stocking rate – approximate density (per ha)

This species needs to utilise shelter habitats such as fallen timber, ground litter and cracks that form in clay soils during extended dry periods, to survive typically hot, dry conditions (DCCEEW 2023b) which makes it difficult to detect even in optimal conditions. The species is cryptic in nature and existing records are sparse. Detection is further constrained by poorly understood ecology and local movements (DoE 2014). Due to these challenges, this attribute has not been scored for this species, and score weightings have been adjusted accordingly.

3.6 Squatter Pigeon (southern)

The squatter pigeon is a ground foraging granivore which can utilise a wide range of open-forest to sparse open-woodland and scrub habitats, typically dominated by eucalypts but which may also be dominated by *Acacia*, *Callitris*, and *Melaleuca* species, or tussock grasses (DoE 2026a; Lloyd et al 2025).

Suitable foraging and breeding habitat for this subspecies is typically associated with gentle slopes (Lloyd et al. 2025). Areas of suitable foraging habitat were previously linked to flat to undulating plains and foothills (land zone 5) (Wilson 2012) and lateritic (duplex) soils on low 'jump-ups' and escarpments (land zone 7) (DoE 2026a). Recent evidence suggests foraging habitat is more strongly associated with alluvial plains across all bioregions (land zone 3) (Lloyd et al. 2025). Similarly, suitable breeding habitat was previously linked to land zone 5 and 7, however, recent analysis of records confirmed that breeding can occur across several land zones (3, 5, 8, 11) (Lloyd et al. 2025). Consequently, it is likely that this subspecies can nest within any land zone that is located close to foraging habitat and a permanent water source. Despite this, their known preference for sandy soils suggests that they are less likely to use land zone 4 (clay plains) for foraging and nesting.

Like other granivorous birds inhabiting arid to semi-arid environments, squatter pigeons must drink regularly, possibly daily, and are described as being found nearly always near permanent water (Lloyd et al. 2025). Previous advice suggested that foraging habitat was likely located within 3 km of permanent water and breeding habitat was located within 1 km (DoE 2026a), however, a recent analysis of records suggests this is more likely to be within 1.7 km and 500 m of permanent water, respectively (Lloyd et al. 2025). Squatter pigeon nests consist of a shallow depression scraped into the ground and sparsely lined with grass, typically underneath grasses, shrubs or other microhabitat features (DoE 2026a).

Groundcover vegetation in suitable foraging and breeding habitat is patchy, consisting of native perennial tussock grasses or a mixture of perennial tussock grasses and low shrubs and/or forbs (DoE 2026a). Previous estimates of preferred groundcover vegetation rarely exceeded 33% (DoE 2026a), whereas more recent estimates suggest that the quantity of groundcover vegetation is likely to vary depending on the type of vegetation community (remnant vs regrowth) and floristic composition, and can range anywhere between approximately 20% and 60%, and occasionally higher (Lloyd et al 2025). Furthermore, squatter pigeons are commonly observed foraging along the sides of roads, tracks, within stock yards and around cattle troughs where they also drink (DoE 2026a).

It is estimated that approximately 95% of the squatter pigeons diet consists of seeds (primarily from low vegetation such as grasses, herbs and shrubs) (DoE 2026a). Given that foraging resource availability is likely to be influenced by rainfall patterns from year to year, the southern subspecies is likely to be sedentary where water and foraging resources are reliable in the local region (DoE 2026a). When these resources become unavailable, the subspecies may disperse locally or regionally along vegetated corridors in search of other foraging resources. There is also some

evidence to suggest that this subspecies may migrate (either locally or regionally), however, this is difficult to substantiate (DoE 2026a).

3.6.1 Site condition – Species Habitat Indices

3.6.1.1 Quality and availability of food and foraging habitat

The squatter pigeon is strongly reliant on the presence and availability of native perennial grass seeds in proximity to perennial water sources (DoE 2026a). Grass seeds make up 95% of their diet. The three parameters selected to assess the quality and availability of food and foraging habitat therefore relate to native grass species richness, grass species abundance and proximity to perennial water source.

The first parameter assessed is *native grass richness*. Higher species richness is likely to reflect a wider range of reproductive strategies and phenologies, thereby supporting more continuous seed availability throughout the year. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 3), compared to the relevant RE benchmark and scored using **Table 3.31**. Score scaling presented in **Table 3.31** is based on Section 5.1 of the Guide (Table 2: Native plant species richness – grasses).

The second parameter assessed is *native grass cover (%)*, a suitable proxy for resource abundance, whereby increased grass cover is assumed to correlate with higher seed yield. Site specific field data is collected in accordance with Section 5.1 of the Guide (Step 5), compared to the relevant RE benchmark and scored using **Table 3.31**. Score scaling presented in **Table 3.31** is based on Section 5.1 of the Guide (Table 2: Native perennial grass cover).

The third parameter assessed is *distance to perennial water source (km)*. A recent analysis undertaken by Lloyd et al. (2025) identified that 95% of squatter pigeon records are located within 1.7 km of a perennial water source, suggesting that suitable food and foraging is more likely to occur within proximity to permanent water sources. This parameter has therefore been included as another indicator for the availability of suitable foraging habitat. Sites located within 1.7 km of a perennial water source receive the highest score (10), while sites located further away receive the lowest score (1). No intermediate scores are proposed for this attribute. Score scaling for this parameter is presented in **Table 3.31**.

Table 3.31: Quality and availability of food and foraging habitat parameters – squatter pigeon

Parameter	Parameter measurement area	Score		
		1	5	10
*Native grass richness**	50 x 10 m plot	<25% of RE benchmark	≥25% to 90% of RE benchmark	>90 of RE benchmark
*Native grass cover (%)**	1 x 1 m plots	0 to 50% of RE benchmark	>50% to 90% of RE benchmark	>90% of RE benchmark
Distance to perennial water source (km)	Centre point of BioCondition plot	Site > 1.7 km from perennial water source	-	Site < 1.7 km from perennial water source

*See **Appendix A**, **Table A1** for RE benchmarks

3.6.1.2 Quality and availability of shelter

The squatter pigeon is strongly reliant on groundcover vegetation in proximity to perennial water sources for shelter as it spends most of its time foraging on the ground (DoE 2026; Lloyd et al. 2025). Two parameters have therefore been selected to assess the quality and availability of shelter habitat, including groundcover vegetation (%) and distance to perennial water source (km).

The first parameter assessed is *groundcover vegetation (%)*. Site specific field data for this attribute is collected generally in accordance with Section 5.1 of the Guide (Step 5) and must combine individual covers within the 1 x 1 m plot of the following vegetation categories: native grasses, native forbs, non-native grasses, non-native forbs and shrub cover (up to 1 m). Score scaling for this parameter was developed based on Lloyd, et al. (2025), acknowledging

that optimal cover is likely to be between 24% and 73%, which receives the highest score (10). The resulting score categories for this parameter are provided in **Table 3.32**.

The second parameter assessed is *distance to perennial water source (km)*. A recent analysis undertaken by Lloyd et al. (2025) identified that 95% of squatter pigeon records are located within 1.7 km of a perennial water source, suggesting that suitable shelter habitat is more likely to occur within proximity to permanent water sources. This parameter has therefore been used as an indicator for the quality and availability of shelter habitat. Sites located within 1.7 km of a perennial water source receive the highest score (10), while sites located further away receive the lowest score (1). No intermediate scores are proposed for this attribute. Score scaling for this parameter is presented in **Table 3.32**.

Table 3.32: Quality and availability of shelter parameters – squatter pigeon

Parameter	Parameter measurement area	Score		
		1	5	10
Groundcover vegetation (%)	1 x 1 m plots	0% groundcover vegetation	>0% to <24% or >73% groundcover vegetation	24% to 73% groundcover vegetation
Distance to perennial water source (km)	Centre point of BioCondition plot	Site > 1.7 km from perennial water source	-	Site < 1.7 km from perennial water source

3.6.2 Site context

3.6.2.1 Threats

3.6.2.1.1 Summary of relevant threats

A summary of the threats identified for the squatter pigeon in its Species Profile and Threats Database (DoE 2026a), Conservation Advice (TSSC 2015) and the threat abatement plan for predation by feral cats (DCCEEW 2024) is provided in **Table 3.33**. Justifications for each threat's inclusion or exclusion in the threat assessment has also been provided.

Several key threats are considered relevant for this species and have been included in the assessment, these are habitat loss caused by land clearing, invasive weeds, habitat degradation caused by livestock grazing, inappropriate fire regimes, and predation by feral cats, and foxes. For threats proposed to be included in the threat assessment, the parameter used to assess the threat is also identified.

Table 3.33: Summary of threats – squatter pigeon

Threats	Assessment Proposed?	Justification	Assessment parameter
Habitat loss caused by land clearing (DoE 2026a; TSSC 2015)	Yes	Both the impact and offset sites are in areas where vegetation has been historically cleared to facilitate pastoral activities and the development of CSG infrastructure.	*Vegetation protection status*
Invasive weeds (especially buffel grass) (DoE 2026a; TSSC 2015)	Yes	Invasive weeds within the impact and offset areas can change the floristic and structural characteristics of habitat and consequently alter resource availability for the species, as well as potentially increasing bushfire risk.	*Average non-native plant cover (%)*

Threats	Assessment Proposed?	Justification	Assessment parameter
Habitat degradation caused by livestock grazing (DoE 2026a; TSSC 2015)	Yes	The impact and offset sites are in areas where habitat has been impacted by domestic livestock grazing.	*Grazing intensity*
Inappropriate fire regimes (DoE 2026a; TSSC 2015)	Yes	The impact and offset areas contain habitat for this species that may be impacted by inappropriate fire regimes.	*Potential for inappropriate fire regimes*
Predation by feral cats (DoE 2026a; TSSC 2015)	Yes	Ground-dwelling and ground-nesting birds are likely to be preyed upon by feral cat populations. Due to this species primarily foraging and breeding on the ground, and the likely presence of feral cats at the impact and offset sites, this threat has been included in the assessment.	*Pest animal Activity Index – feral cat*
Predation by European red foxes (DoE 2026a; TSSC 2015)	Yes	Ground-dwelling and ground-nesting birds are likely to be preyed upon by European red fox populations. Due to this species primarily foraging and breeding on the ground, and the likely presence of foxes at the impact and offset sites, this threat has been included in the assessment.	*Pest animal Activity Index – fox*
Predation by feral dog (DoE 2026a)	No	Whilst listed as a current threat in the species profile (DoE 2026a), predation by feral dog is not a listed threat in the species Conservation Advice (TSSC 2015), and is therefore not included in the threat assessment.	N/A
Habitat degradation by rabbits (TSSC 2015)	No	Whilst the threat of habitat degradation by rabbits was listed in the Conservation Advice (TSSC 2015) for this species, it is difficult to determine the severity of this threat, therefore it has not been included in the threat assessment.	N/A
Climate Change – increased likelihood of extreme events (DoE 2026a)	No	Climate change will increase and continue to increase the likelihood of extreme events such as wildfires, heatwaves, and droughts, adversely impacting habitat and resource availability, and overwhelming birds physiological limits. As climate change is a broad scale complex ecological threat, and is generally considered consistent between the impact and offset site, it has been excluded from the threat assessment.	N/A
Illegal hunting (DoE 2026a; TSSC 2015)	No	This species was extensively hunted by early settlers but this is no longer considered to be a 'current' threatening process despite occasional hunting being recorded. This	N/A

Threats	Assessment Proposed?	Justification	Assessment parameter
		species has been fully protected in Queensland since the late 1990s.	
Predation by native species such as birds of prey (DoE 2026a)	No	Native birds of prey are listed as a threatening process for the squatter pigeon (southern). Impacts from these species have not been included in the threat assessment as control of these native species is beyond the scope of the OMP.	N/A

An assessment of the risk rating for the identified threats has been undertaken using the threat matrix (**Section 2.4.6**) and information provided in the squatter pigeon Species Profile and Threats Database (DoE 2026a), Conservation Advice (TSSC 2015) and threat abatement plan for predation by feral cats (DCCEEW 2024). A summary of the assessment including the assigned likelihood, consequence and risk rating is presented **Table 3.20**.

Table 3.34: Risk rating of the identified threats to squatter pigeon

Threat	Likelihood	Consequence	Risk rating
Habitat loss caused by land clearing (DoE 2026a; TSSC 2015)	Almost certain	Major	Very high risk (20)
Invasive weeds (especially buffel grass) (DoE 2026a; TSSC 2015)	Almost certain	Minor	Very high risk (10)
Habitat degradation caused by livestock grazing (DoE 2026a; TSSC 2015)	Almost certain	Major	Very high risk (20)
Inappropriate fire regimes (DoE 2026a; TSSC 2015)	Almost certain	Moderate	Very high risk (15)
Predation by feral cats (DoE 2026a; TSSC 2015)	Almost certain	Moderate	Very high risk (15)
Predation by European red foxes (DoE 2026a; TSSC 2015)	Almost certain	Moderate	Very high risk (15)

3.6.2.1.2 Threat assessment parameters and scoring

The assessment parameter for habitat loss caused by land clearing is vegetation protection status. As presented in **Table 3.35**, matter areas containing non-remnant vegetation (Cat X) under the VM Act are typically not protected from broad scale clearing activities and receive the lowest score (1). Matter areas mapped as remnant (Cat B) or high-value regrowth (Cat C) under the VM Act have some level of protection but can be cleared subject to statutory approvals. These areas receive a moderate score (7). Areas mapped as Category A under the VM Act, or that are protected via a Statutory Covenant under the *Land Act 1994* or the *Land Title Act 1994*, have the highest level of protection and receive the highest score (15). Where a matter area contains a mixture of these, the lowest relevant protection score will be awarded.

The assessment parameter for invasive weeds (particularly buffel grass) is average non-native plant cover (%). Non-native plant cover is assessed in accordance with Section 5.1 of the Guide (Step 3) at each assessment site individually and then the average across all assessment sites is determined to define a single cover score for the entire matter

area. The average cover is then compared to the score scales presented in **Table 3.35**, which are based on Section 5.1 of the Guide (Table 2: Non-native plant cover).

The assessment parameter for habitat degradation caused by livestock grazing is grazing intensity. As presented in **Table 3.35**, matter areas where grazing is excluded receive the highest score. Where rotational grazing is implemented (i.e. livestock are periodically moved between paddocks to prevent overgrazing) the moderate score (7) is applied. Areas that are continuously grazed receive the lowest score (1).

The assessment parameter for inappropriate fire regimes is potential for inappropriate fire regimes. As presented in **Table 3.35**, this parameter is scored by assessing the nature of bushfire management and mitigation in place across the matter area.

The assessment parameter for predation by feral cat and foxes is *pest animal Activity Index – feral cat and fox*. The presence of pest animals within the impact and offset areas is assessed using methods outlined in the OMP, focusing on the collection of unbaited camera trap data. An Activity Index (AI) is calculated using this data and informed by methods in Jenks et al. (2011) and based on the following formula:

$$Activity\ Index\ (AI) = (\frac{Total\ number\ of\ detections}{Total\ number\ of\ trap\ hours})\ x100$$

A detection is the positive identification of one of the target species within a 20-minute interval, with a maximum of three independent detections possible per hour. For example, if the maximum number of detections were observed (3 per hour), on a single trap day (24 hours), using a single camera, the AI would be 300 (72 detections ÷ 24 hours x 100 = 300).

The scoring categories defined in **Table 3.35** have been informed by the results of the baseline pest animal monitoring event (Attexo 2025) indicating the presence of a relatively low abundance of pest animals across the impact and offset area. The baseline surveys recorded a total of seven (7) pest animals (five (5) cats, one (1) rabbit and one (1) pig) over a combined survey effort of 3,827 trap hours (i.e. 12 cameras deployed for approximately 2 weeks).

The site-specific data is compared to the scoring categories in **Table 3.35**. These scoring categories have been developed based the following assumptions:

- Total trap hours = 3,827 hours which is equivalent to 12 cameras deployed over approximately 2 weeks (note that monitoring design in the OMP should replicate the 3,827 total trap hours to ensure results are comparable over time).
- < 5 detections per event indicates sporadic and/or incidental pest activity (Score of 15).
- 5 - 9 detections per event indicates moderate pest activity (Score of 7).
- ≥ 10 detections per event indicates frequent and/or resident-level pest activity (Score of 1).

Table 3.35: Parameters and scores for assessing threats – squatter pigeon

Parameter	Score		
	1	7	15
Vegetation protection status	Non-remnant / Category X	Remnant (Category B) or High Value Regrowth (Category C)	Category A or Statutory Covenant
Average non-native plant cover (%)	>50% average cover	5-50% average cover	<5% average cover
Grazing intensity	Continuous grazing	Rotational grazing	Grazing excluded
Potential for inappropriate fire regimes	No bushfire management or mitigation measures are	Bushfire management measures are	A Bushfire Management Plan, incorporating species specific fire management

Parameter	Score		
	1	7	15
	implemented within the matter area	implemented within the matter area, but they do not address species specific requirements	requirements, is actively implemented within the matter area
Pest animal Activity Index – feral cat	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306
Pest animal Activity Index – fox	AI ≥ 0.2613	AI ≥0.1306 and <0.2613	AI <0.1306

3.6.2.2 Species mobility capacity

Whilst thought to be mostly sedentary, the squatter pigeon is capable of flight and may locally disperse in response to seasonal rainfall patterns and resource availability (DoE 2026a). This species is therefore considered to have a strong mobility capacity. Considering the lack of physical barriers that could impede the movement of this species throughout the surrounding landscape, the species mobility capacity attribute has been removed from the scoring procedure for this species and score weightings have been adjusted accordingly.

3.6.3 Species stocking rate – approximate density (per ha)

Approximate density (per ha) is the only attribute within the ***species stocking rate*** indicator that requires species-specific scoring. For scoring methods relating to the remaining three attributes refer to **Section 2.5**.

3.3.3.1 Population and density data

The conservation advice for the squatter pigeon does not provide a specific population density estimate. However, the Action Plan for Australian Birds (Garnett & Baker 2021) estimates a total population of 220,000 mature individuals in a 4,400km^2 area of occupancy. Based on these figures, the mean population density used to inform the scoring for this attribute is calculated as 0.5 individuals per hectare (**Table 3.36**).

3.3.3.2 Assessing approximate density

Due to the uncertainties in both population size and density, a precautionary proxy parameter – number of records per 100 ha - has been applied to score the approximate density attribute. This measure is based on the total number of species records within the matter area and species-specific buffer (>300 ha) (see **Section 2.4.3**. Including the buffer in the assessment area reflects the species' mobility and use of adjacent habitat (see **Section 2.4.3**). Only those species records observed after the year 2000 are incorporated into this calculation. These observations are thought to be representative of the species current distribution and where they are more likely to occur. Under this approach, sites with higher numbers of records are precautionarily assumed to represent greater relative value to the species.

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

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

This parameter is then assigned a score following **Table 3.36**. Score scaling is deliberately conservative and informed by the density estimate of 0.5 birds per ha (50 birds per 100 ha) provided in the Action Plan for Australian Birds (Garnett & Baker 2021). The highest score is assigned where more than 100 records per 100 ha over the five-year period is recorded.

Table 3.36: Approximate density scoring – squatter pigeon

Parameter	Parameter measurement area	Score			
		0 (no records)	10 (low)	20 (moderate)	30 (high)
Number of records per 100 ha	Matter area plus context buffer described in **Section 2.4.3**.	0	>0-50	>50-100	>100

4. References

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Appendix A

Regional Ecosystem and Species-Specific Benchmarks

Table A1: Regional Ecosystem benchmarks

RE	Recruitment	Non-native plant cover	Tree species richness	Shrub species richness	Grass species richness	Forb/other species richness	Emergent canopy height	Tree canopy height	Tree subcanopy height	Emergent canopy cover	Tree canopy cover	Tree subcanopy cover	Large tree threshold-Euc	Large tree threshold-Non euc	Total large trees-Euc	Total large trees-Non-Euc	Shrub canopy cover	Native grass %	Litter cover	Coarse woody debris
11.3.14	100	0	5	7	7	19	na	16	8	na	53	18	40	32	7	39	8	18	48	544
11.3.25	100	0	4	4	8	13	na	23	11	na	34	12	53	26	19	13	7	35	21	473
11.3.27f	100	0	1	2	5	9	na	20	na	na	44	na	74	na	24	na	na	5	11	770
11.3.4	100	0	4	3	11	17	na	24	14	na	30	15	53	na	19	na	3	55	37	509
11.5.1	100	0	5	5	8	10	na	20	9	na	25	20	44	24	7	10	6	23	45	135
11.5.20	100	0	3	4	7	13	na	23	10	na	43	38	46	23	14	10	5	8	57	178
11.5.21	100	0	6	10	7	16	na	19	9	na	41	32	43	28	6	37	40	9	46	738
11.5.4	100	0	4	3	13	18	na	21	10	na	30	24	49	28	7	10	7	30	58	204
11.7.2	100	0	3	4	5	8	19	14	7	5	50	10	38	24	11	24	12	29	39	823
11.7.4	100	0	4	6	7	9	na	18	9	na	29	8	46	26	14	7	7	12	50	320
11.7.5	100	0	2	12	3	4	9	na	na	4	na	na	na	na	na	na	46	3	19	na
11.7.7	100	0	5	9	4	9	na	19	9	na	40	20	49	28	11	15	15	4	68	288

Table A2: Species specific benchmarks derived from RE Technical Descriptions

Regional ecosystem	Glossy Black Cockatoo		Koala	
	Foraging tree cover benchmark	Foraging tree species richness benchmark	Locally important Koala tree (LIKT) cover benchmark	LIKT species richness benchmark
11.3.14	27	2	14	1
11.3.25	36	2	119	6
11.3.27f	5	1	103	3
11.3.4	0	0	114	5
11.5.1	42	2	47	4
11.5.20	23	1	120	3
11.5.21	23	2	21	4
11.5.4	24	2	25	3
11.7.2	0	0	44	4
11.7.4	0	1	105	4
11.7.5	0	0	42	3
11.7.7	27	2	67	2

A-1 Example of how LIKT benchmarks were calculated

Due to the koala's reliance on specific LIKTs (Youngentob et al. 2021), the availability of these species is critical in assessing the quality of koala food and foraging habitat. The overall canopy cover of LIKT species was used to calculate the **quality and availability of food and foraging habitat** for the koala (which forms a component of the overall ***site condition*** score). While benchmarks for this attribute have not been formerly developed, the presence of LIKT species within each RE has been described in detail in each RE's respective Technical Description (DES 2018).

The following example steps through how this benchmark was generated for RE 11.3.25.

The Technical Description for RE 11.3.25 (page 80 of DES 2018) provides a detailed summary of tree species that occur in the 4 strata (emergent, T1, T2 and T3) of this vegetation community. Using the list of known LIKT species provided by Youngentob et al. (2021), a table summarising the canopy cover (not relative cover) for each LIKT species within each strata was made and is provided below in **Table A3**. The total LIKT cover for this RE was calculated by summing all the canopy cover values for each LIKT in each stratum. A benchmark value of 119% LIKT cover was generated using this method. Whilst this value is >100%, we believe that this is representative of the available foraging resources that could be available to the koala, as they can forage within any stratum. Limiting Total LIKT Cover to 100% would underrepresent the availability of foraging resources available to this species.

Table A3: Summary of LIKT species cover for RE 11.3.25

LIKT Species (Youngentob *et al.* 2021)	Canopy Cover*				Total LIKT Cover (%)
	E	T1	T2	T3	
Eucalyptus brownii	-	-	-	-	119
Eucalyptus camaldulensis	2	25	6	1	
Eucalyptus chloroclada	-	-	-	-	
Eucalyptus conica	-	-	-	-	
Eucalyptus coolabah	-	15	3	2	
Eucalyptus crebra	-	3	-	-	
Eucalyptus drepanophylla	-	-	-	-	
Eucalyptus dura	-	-	-	-	
Eucalyptus exserta	-	-	-	-	
Eucalyptus fibrosa	-	-	-	-	
Eucalyptus laevopinea	-	-	-	-	
Eucalyptus largiflorens	-	-	-	-	
Eucalyptus longirostrata	-	-	-	-	
Eucalyptus major	-	-	-	-	
Eucalyptus melanophloia	-	5	-	-	
Eucalyptus microcarpa	-	-	-	-	
Eucalyptus moluccana	-	-	-	-	
Eucalyptus ochrophloia	-	-	-	-	
Eucalyptus orgadophila	-	-	-	-	

LIKT Species (Youngentob *et al.* 2021)	Canopy Cover*				Total LIKT Cover (%)
	E	T1	T2	T3	
Eucalyptus populnea	-	7	17	-	
Eucalyptus punctata	-	-	-	-	
Eucalyptus saligna	-	-	-	-	
Eucalyptus sideroxylon	-	-	-	-	
Eucalyptus tereticornis	6	23	2	2	

* An "-" indicates that the respective LIKT species is not listed in that strata for this RE.

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Appendix B

Baseline Weed and Pest Animal Monitoring Methods

B-1 Weed monitoring

Baseline weed surveys were undertaken at 26 surveys sites across Lots 31 and 32 AU60 in September 2025 and August 2026 to assess the baseline species abundance and richness of non-native species including restricted invasive plants under the *Biosecurity Act 2014* (Qld) and restricted pest weeds listed by the Western Downs Regional Council. At each site a 50 x 10 m quadrat was established to assess the percentage weed cover and record species richness. In addition to the weed surveys, baseline photos were taken at the centre point of each BioCondition transect in a north, east, south, west and ground direction to provide a visual means to detect changes in weed cover as well as native vegetation composition, structure and integrity over time.

The weed survey sites are collocated within the BioCondition plots used to inform the habitat quality scores. **Figure 4.1** presents the location of the baseline survey locations within the offset area.

B-1-1 Weed cover survey

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

- Establish a 50 x 10 m quadrat within the larger 100 x 50 m BioCondition plot. The location of this plot is to be recorded to allow for repeat survey effort and consistent comparison between monitoring events.
- Slowly traverse the quadrat in a systematic manner, and record weed species present and estimate the percentage of the quadrat occupied by each weed species using **Figure B.1** (from McNaught et.al 2008) as a guide.
- Actual percentage cover estimates must be used (rather than using the modified Braun-Blanquet method), as actual values can be converted to these broader indices for mapping or can be analysed separately (Watson et al. 2021).
- The entire cover of each species is to be recorded irrespective of any overlap by a different species (i.e. the combined cover value of all target species may exceed 100%) (Watson et al. 2021).
- Record the assigned percentage cover for each weed species in the datasheet.

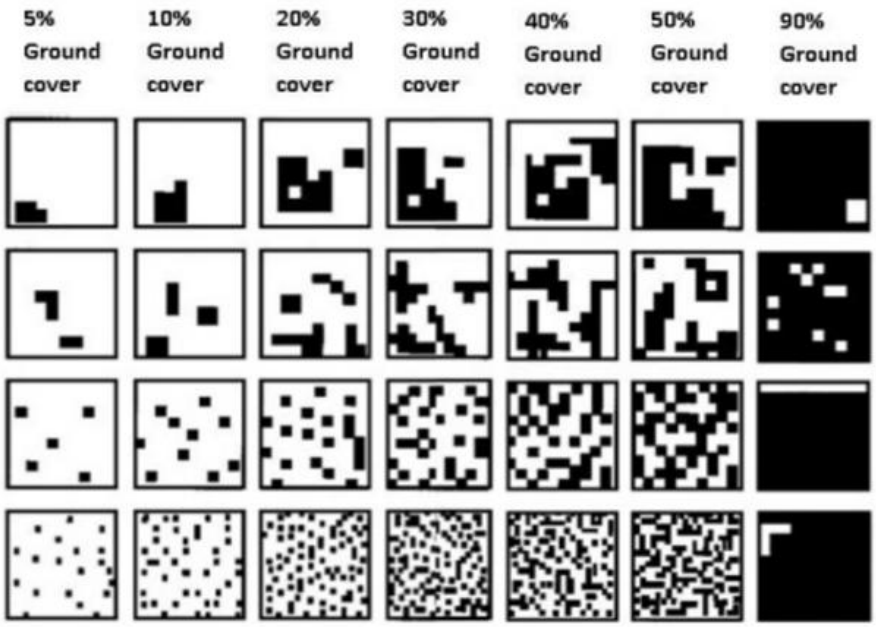


Figure B.1: Distribution of ground cover to assist in determining percentage weed cover

B-1-2 Photo monitoring

Photo monitoring provides a visual means to detect changes in weed cover as well as native vegetation composition, structure and integrity in areas of active management.

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

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

B-2 Pest animal monitoring

Pest animal surveys were undertaken in July and August 2025 through the deployment of remote sensing camera traps to determine pest animal species presence and activity within the offset area.

Cameras were deployed at 12 sites across Lots 31 and 32 AU60 and distributed throughout the various vegetation communities identified within this area (**Figure B.2**:). Camera traps were deployed for a total of 3,827 trap hours. Cameras were unbaited to avoid interference with predator behaviour and were placed along obvious fauna trails or focusing on areas where pest animals could traverse. At each camera trap location, the following data is to be recorded:

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

An Activity Index (AI) is calculated for each pest animal using this data and informed by methods in Jenks et al. (2011) and based on the following formula:

$$Activity\ Index\ (AI) = (\frac{Total\ number\ of\ detections}{Totalnumber\ of\ trap\ hours})\ x100$$

A detection is the positive identification of one of the target species within a 20-minute interval, with a maximum of three independent detections possible per hour. For example, if the maximum number of detections were observed (3 per hour), on a single trap day (24 hours), using a single camera, the AI would be 300 (72 detections ÷ 24 hours x 100 = 300).

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Offset Proposal

Figure B 2

Offset area pest monitoring locations

- Camera trap
- Major Watercourse
- Minor Watercourse
- Offset Area (302.9 ha)
- Girrahween Station

Bottle Tree Creek

31AU60

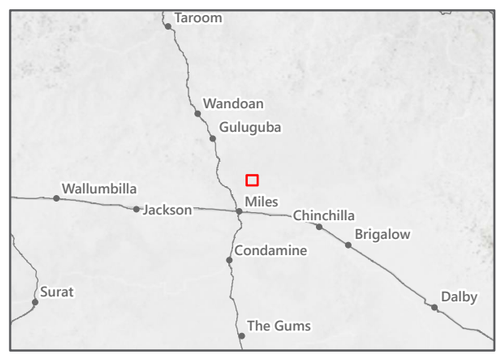
32AU60

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DRAWN: KB
REVIEWED: MW

DATE: 22/05/2026
DWG No.: ARR-005_085[C]



N

0 Km 1

SCALE (A3): 1:22,500

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Data Source:Service created by Adam Tolo with input from Peter Brennan and Chris Beavon,, © State of Queensland (Department of Resources) 2024, © State of Queensland (Department of Resources), 2023, Vantor, © OpenStreetMap contributors, © State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

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Appendix C

Baseline Weed and Pest Animal Results

C-1 Baseline weed surveys

Table C.1: Baseline weed survey results 2025

Site	% Cover											Number of Non-Native Species	Total Weed Cover (%)
	Bidens pilosa	*Calyptocarpus vialis*	*Chamaecrista rotundifolia*	*Erigeron bonariensis*	*Glandularia aristigera*	*Heliotropium amplexicaule*	*Megathyrsus maximus*	*Melinis repens*	*Oxalis corniculata*	*Panicum spp.*	*Silybum marianum*		
G03					1			1				2	2
G04	1	1			2				1			4	5
G05					6	1			1			3	8
G06					1							1	1
G07					1							1	1
G08												0	0
G09												0	0
G10		1			6				1			3	8
G11					1							1	1
G12					1		10		1			3	12
G13				1	1	2	1		1		1	6	7
G18												0	0
G20					3				1			2	4
G21					1		1	1		1		4	4
G22			1		1		1	2				4	5
G23												0	0
G25							1	2	1			3	4
G26												0	0
G28												0	0
G29												0	0
G35								1				1	1
G36												0	0
G37												0	0
G38												0	0

Site	% Cover											Number of Non-Native Species	Total Weed Cover (%)
	Bidens pilosa	*Calyptocarpus vialis*	*Chamaecrista rotundifolia*	*Erigeron bonariensis*	*Glandularia aristigera*	*Heliotropium amplexicaule*	*Megathyrsus maximus*	*Melinis repens*	*Oxalis corniculata*	*Panicum spp.*	*Silybum marianum*		
G39								3				1	3
Cover (%)	**1**	**2**	**1**	**1**	**25**	**3**	**14**	**10**	**7**	**1**	**1**		**66**
Count	**1**	**2**	**1**	**1**	**12**	**2**	**5**	**6**	**7**	**1**	**1**		**12**

C-2 Baseline photo monitoring

Baseline monitoring photos are provided in the OMP (Appendix D).

C-3 Baseline pest animal survey

Table C.2: Baseline pest animal survey results 2025

Species	ATT 133 SD 18	ATT 147 SD Micro	ATT 150 SD BC11	ATT 196 SD 10	ATT 204 SD BC09	ATT 205 SD BC01	ATT 206 SD BC08	ATT 209 SD BC07	ATT 211 SD BC02	ATT 9 SD BC04	ATT 130 SD12	NTO SD AR01	Total count	AI score
Cat	1							3				1	5	0.1306
Rabbit				1									1	0.0261
Pig												1	1	0.0261
Dog													0	0
Fox													0	0
Total Trap Hours	343	339	271	310	316	268	343	334	294	316	356	337	3827	

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Appendix D

MHQA - Site Context Figures

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Impact Area - Corben's Long-Eared Bat

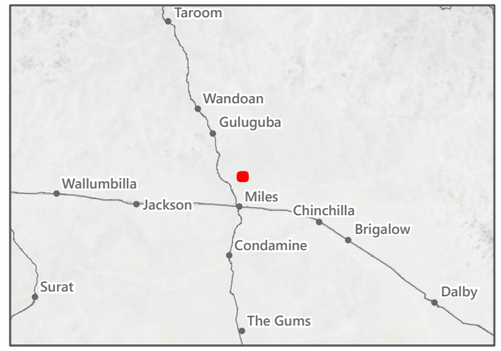
Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Corbens Long-Eared Bat Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_060-063[A]



N

0 500

SCALE (A3): 1:10,000

Attexo

Data Source:© State of Queensland (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development) 2025, © State of Queensland (Department of Resources) 2024, Vantor, © OpenStreetMap contributors, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Esri, USGS

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SGP NORTH SOLAR FARM

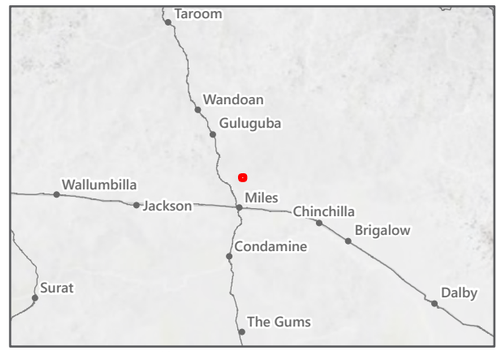
Impact Area - Corben's Long-Eared Bat

Connectedness

- Minor watercourse
- Impact area
- Lot boundary
- Corbens Long-Eared Bat Matter area
- Regrowth vegetation
- Non-remnant vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_060-063[A]



N

0 m 200

SCALE (A3): 1:5,000

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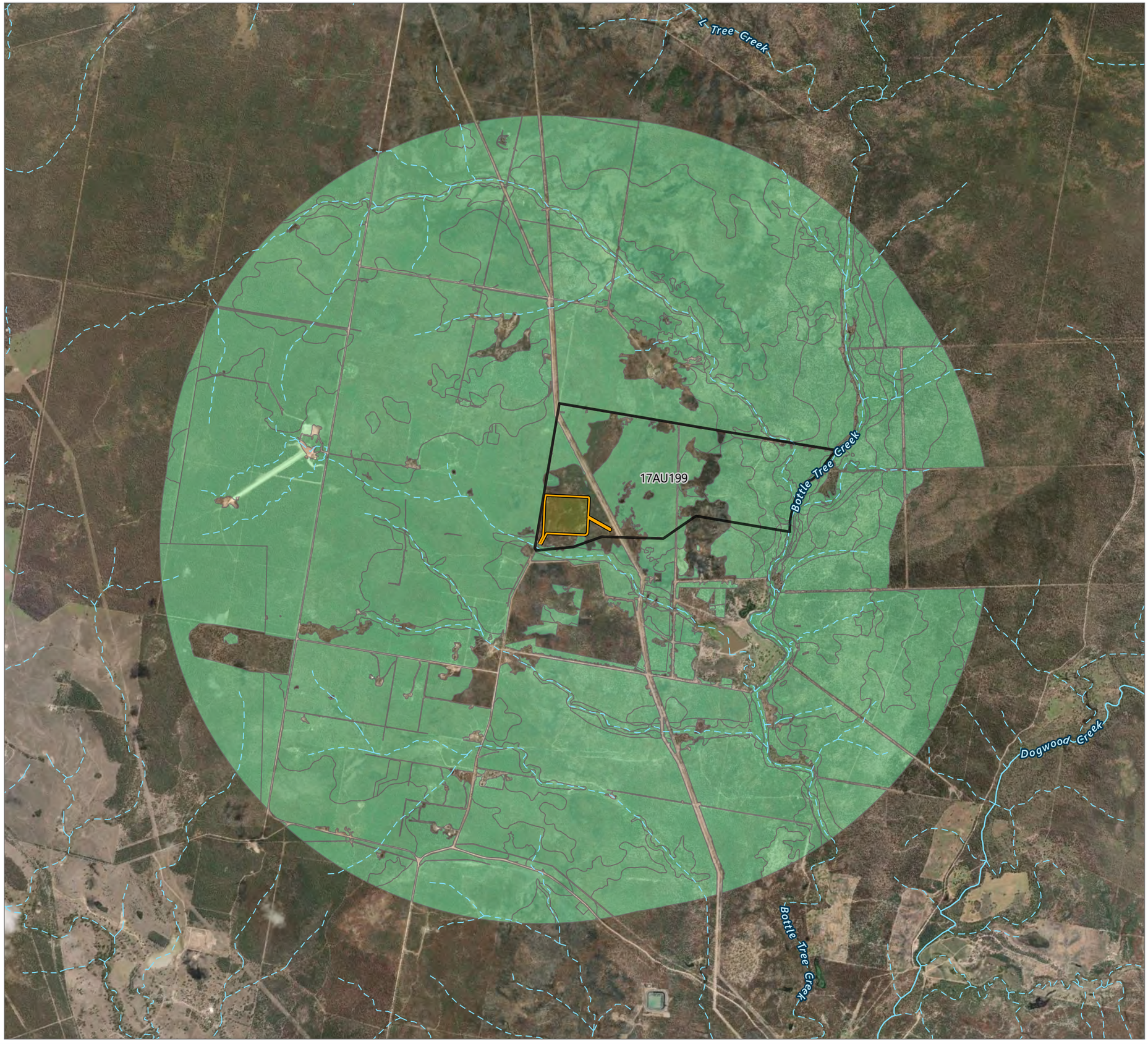
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SGP NORTH SOLAR FARM

Impact Area - Corben's Long-Eared Bat

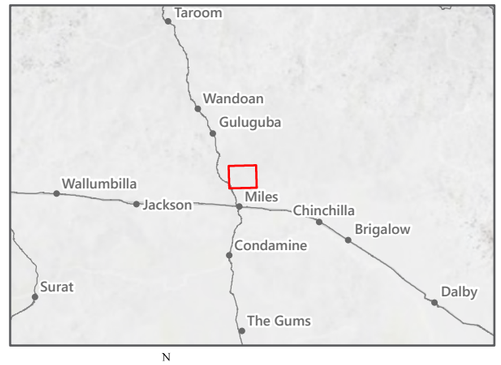
Site Context

- Major watercourse
- Minor watercourse
- Impact area
- Lot boundary
- Corbens Long-Eared Bat Matter area
- Remnant vegetation



DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_060-063[A]



N

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SCALE (A3): 1:50,000

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SGP NORTH SOLAR FARM

Impact Area - Corben's Long-Eared Bat

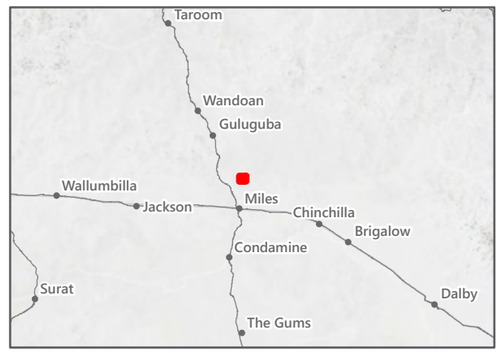
Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Corbens Long-Eared Bat Matter area
- State Ecological Corridor

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_060-063[A]



N

0 500

SCALE (A3): 1:12,500

Attexo

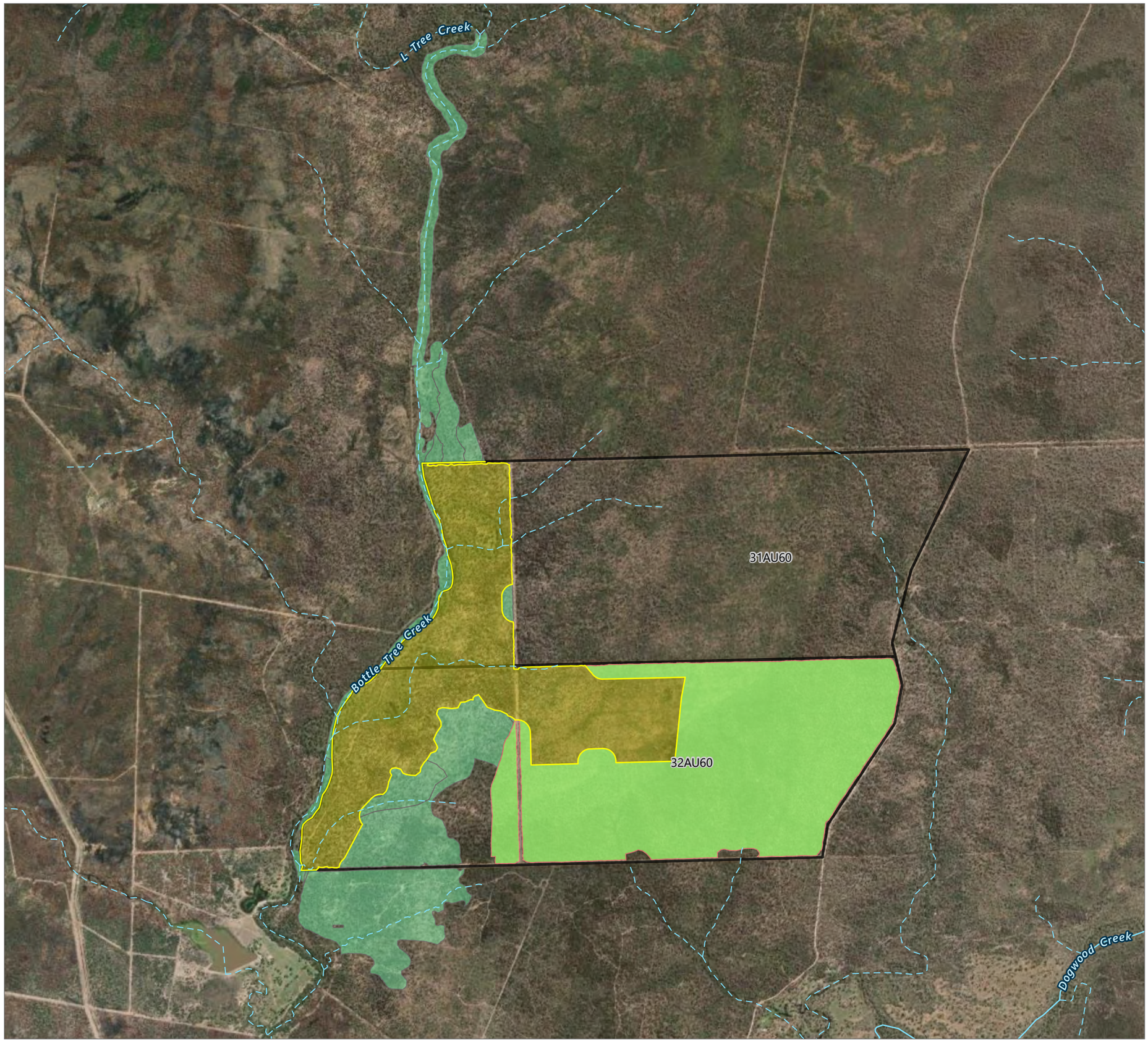
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SGP NORTH SOLAR FARM

Offset Analysis - Corben's Long-Eared Bat

Size of Patch



- Major watercourse
- Minor watercourse
- Lot boundary
- Corben's Long Eared Bat Matter area
- Remnant vegetation
- Regrowth vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_035-39[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis - Corben's Long-Eared Bat

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Corben's Long Eared Bat Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-Remnant vegetation

31AU60

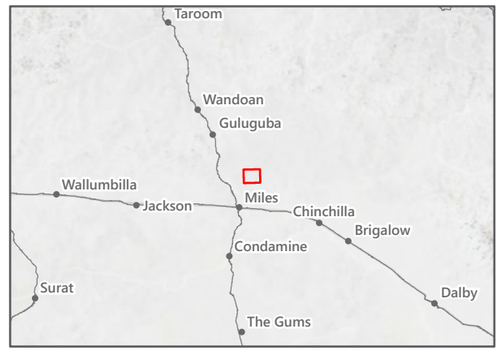
32AU60

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_035-39[A]



N

0 km 1

SCALE (A3): 1:30,000

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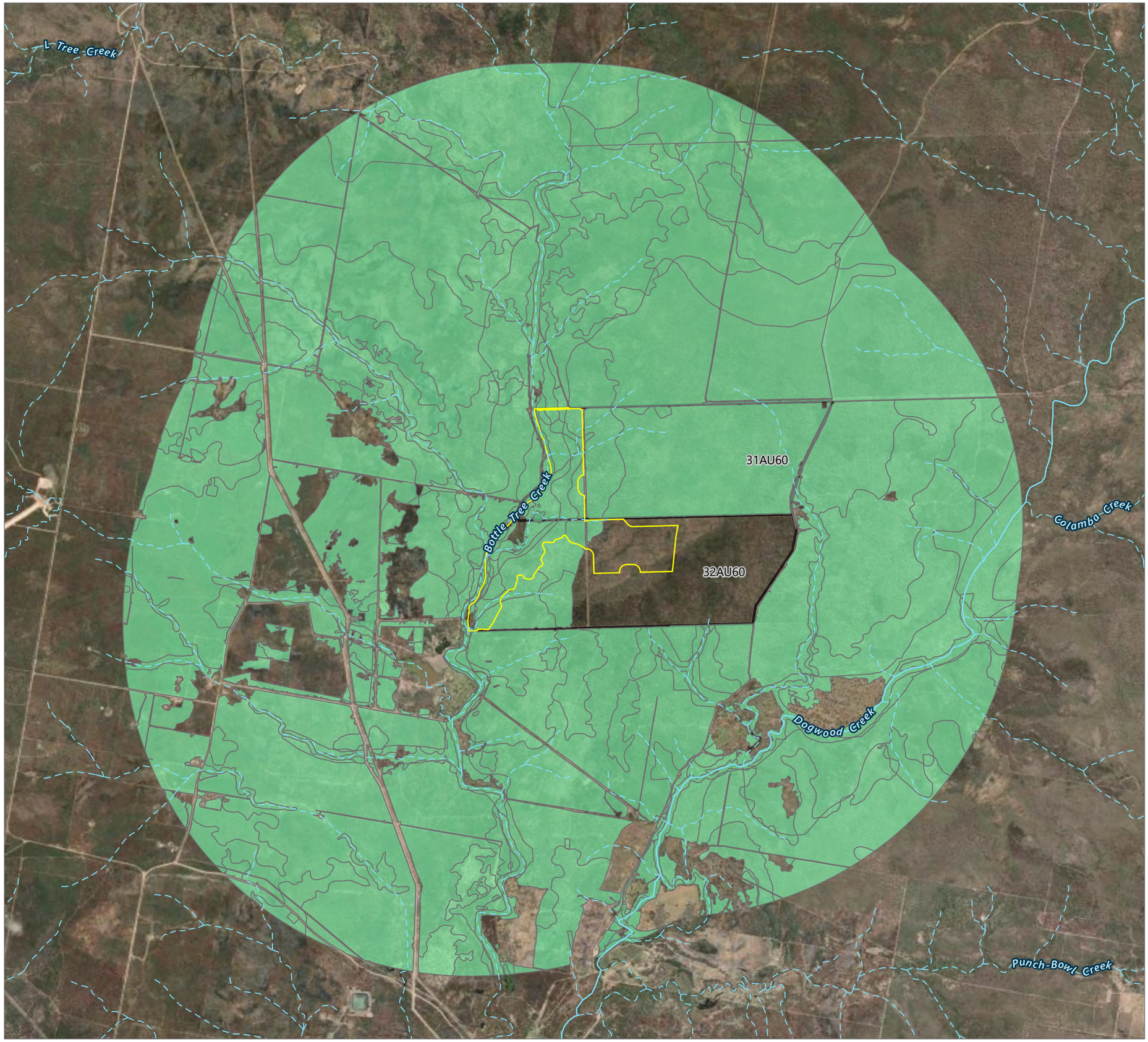
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SGP NORTH SOLAR FARM

Offset Analysis - Corben's Long-Eared Bat

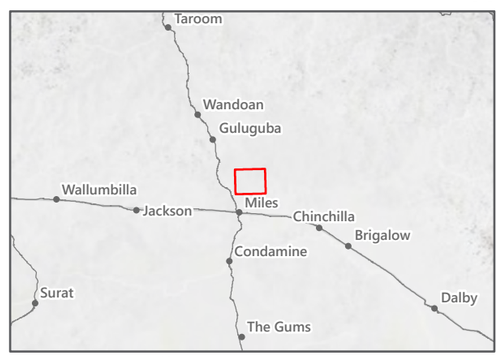
Site Context



- Major watercourse
- Minor watercourse
- Lot boundary
- Corben's Long Eared Bat Matter area
- Remnant vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_035-39[A]



N

0 km 2

SCALE (A3): 1:55,000

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SGP NORTH SOLAR FARM

Offset Analysis - Corben's Long-Eared Bat

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Corben's Long Eared Bat Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

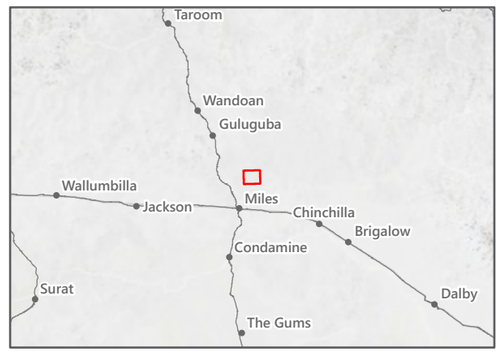
32AU60

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_035-39[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Impact Area - Diamond Firetail

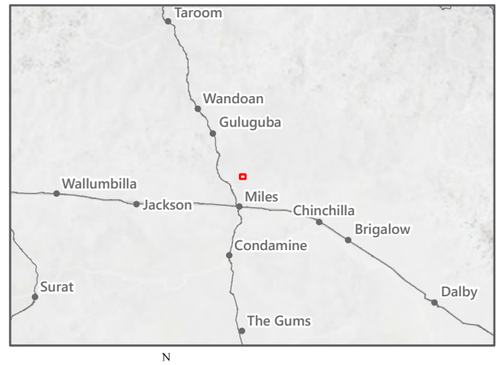
Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Diamond Firetail Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_068-71[A]



N

0 m 500

SCALE (A3): 1:10,000

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SGP NORTH SOLAR FARM

Impact Area - Diamond Firetail

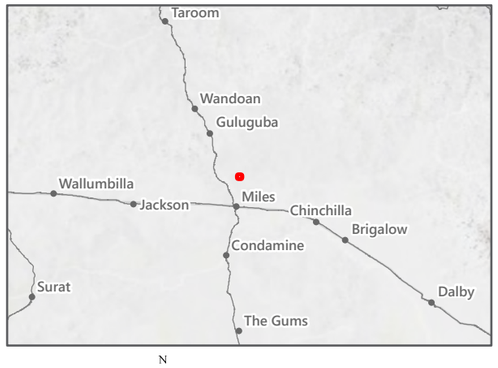


Connectedness

- Minor watercourse
- Impact area
- Lot boundary
- Diamond Firetail Matter area
- Regrowth vegetation
- Non-remnant vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_068-71[A]



N

0 200 m

SCALE (A3): 1:5,000

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SGP NORTH SOLAR FARM

Impact Area - Diamond Firetail

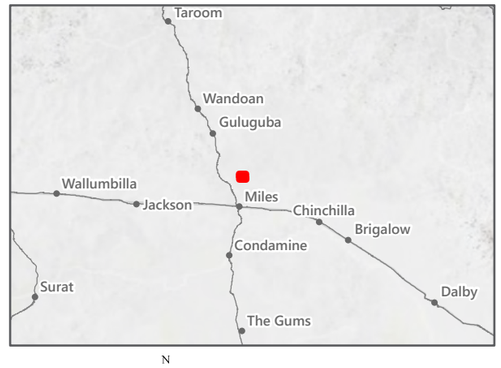
Site Context

- Minor watercourse
- Impact area
- Lot boundary
- Diamond Firetail Matter area
- Remnant vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_068-71[A]



N

m

0 500

SCALE (A3): 1:12,500

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SGP NORTH SOLAR FARM

Impact Area - Diamond Firetail

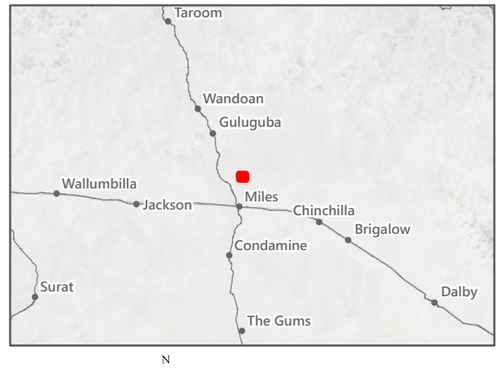
Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Diamond Firetail Matter area
- State Ecological Corridor

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_068-71[A]



N

m

0 500

SCALE (A3): 1:12,500

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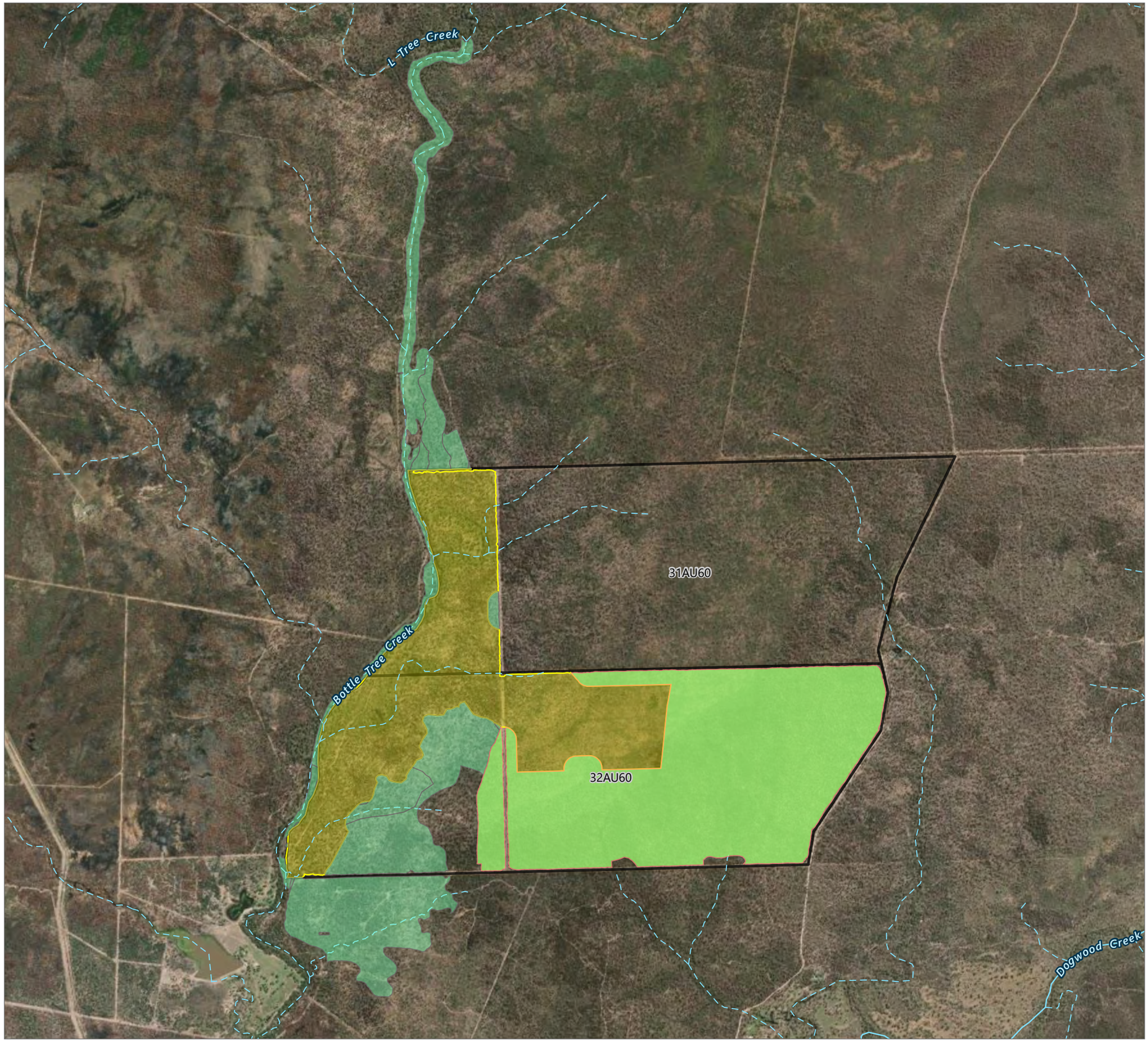
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SGP NORTH SOLAR FARM

Offset Analysis- Diamond Firetail

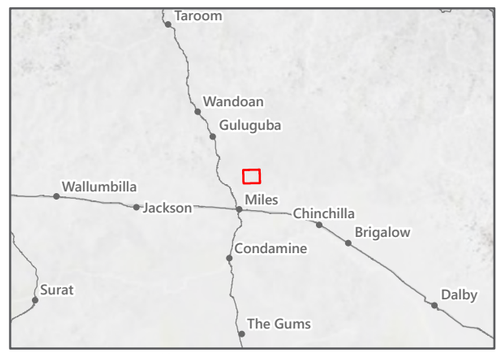
Size of Patch



- Major watercourse
- Minor watercourse
- Lot boundary
- Diamond Firetail Matter area
- Remnant vegetation
- Regrowth vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_051-054[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Diamond Firetail

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Diamond Firetail Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-Remnant vegetation

31AU60

32AU60

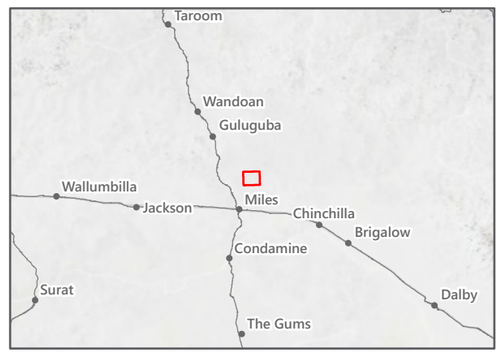
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_051-054[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Diamond Firetail

Site Context

- Major watercourse
- Minor watercourse
- Lot boundary
- Diamond Firetail Matter area
- Remnant vegetation

31AU60

32AU60

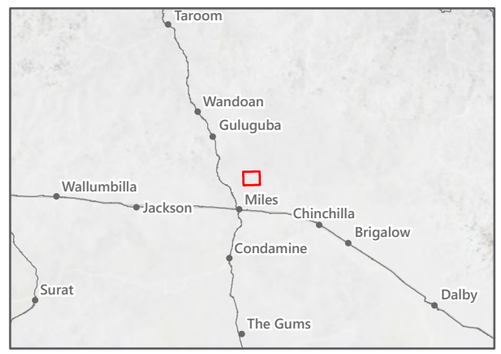
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_051-054[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Diamond Firetail

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Diamond Firetail Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

32AU60

Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_051-054[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Impact Area - Glossy Black-Cockatoo

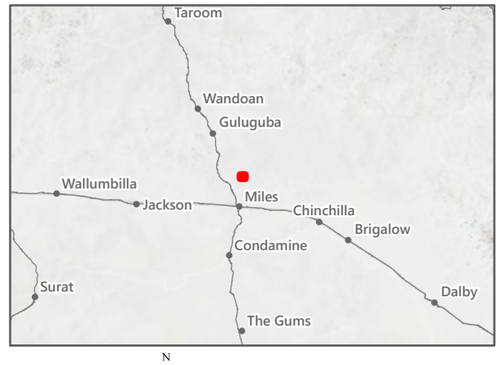
Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Glossy Black-Cockatoo Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_056-059[A]



N

0 m 500

SCALE (A3): 1:10,000

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SGP NORTH SOLAR FARM

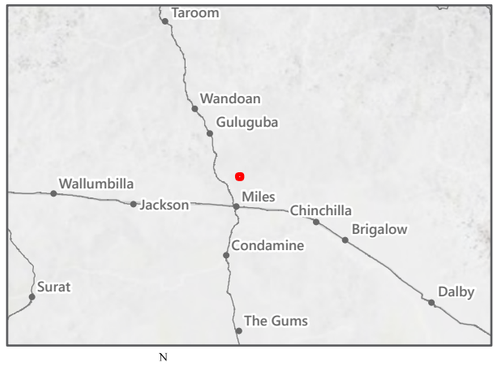
Impact Area - Glossy Black-Cockatoo

Connectedness

- Minor watercourse
- Lot boundary
- Impact area
- Glossy Black-Cockatoo Matter area
- Non-remnant vegetation
- Regrowth vegetation

DRAWN: JT
REVIEWED: MW

DATE: 27/05/2026



N

0 m 200

SCALE (A3): 1:5,000

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SGP NORTH SOLAR FARM

Impact Area - Glossy Black-Cockatoo

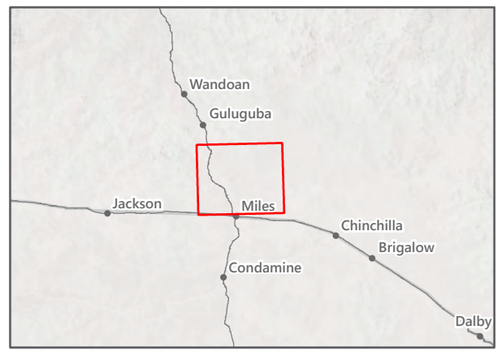
Site Context

- Major watercourse
- Minor watercourse
- Impact area
- Lot boundary
- Glossy Black-Cockatoo Matter area
- Remnant vegetation

Juandah Creek
Bottle Tree Creek
Rocky Creek
Middle Gully
Tin Hut Creek
L Tree Creek
Brumby Creek
Wongongera Creek
Seven Mile Creek
Eleven Mile Creek
Colamba Creek
17AU199
Nine Mile Creek
Punch-Bowl Creek
Jump Up Creek
Wallon Creek
Dogwood Creek
Wallen Creek
Camisla Creek
Columboola Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_056-059[A]



N

0 Km 5

SCALE (A3): 1:125,000

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SGP NORTH SOLAR FARM

Impact Area - Glossy Black-Cockatoo

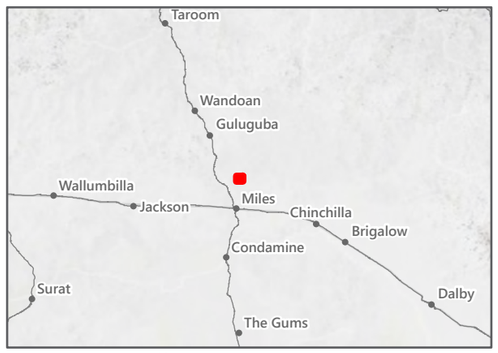
Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Glossy Black-Cockatoo Matter area
- State Ecological Corridor

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_056-059[A]



N

0 m 500

SCALE (A3): 1:12,500

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SGP NORTH SOLAR FARM

Offset Analysis- Glossy Black-Cockatoo

Size of Patch

- Major watercourse
- Minor watercourse
- Lot boundary
- Glossy Black Cockatoo Matter area
- Remnant vegetation
- Regrowth vegetation

L Tree Creek

Bottle Tree Creek

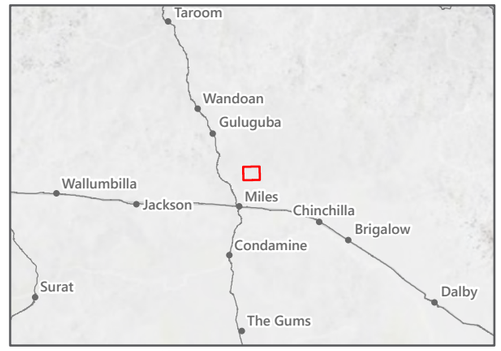
Dogwood Creek

31AU60

32AU60

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_031-034[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Glossy Black-Cockatoo

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Glossy Black Cockatoo Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-remnant vegetation

31AU60

32AU60

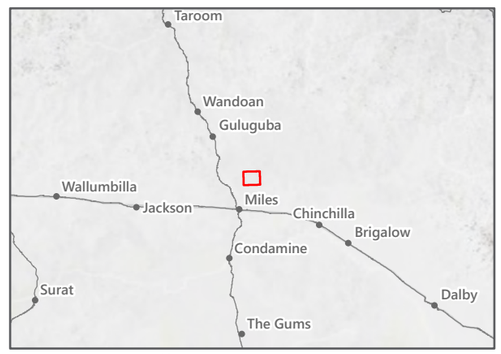
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_031-034[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Glossy Black-Cockatoo

Site Context

- Major watercourse
- Minor watercourse
- Lot boundary
- Glossy Black Cockatoo Matter area
- Remnant vegetation

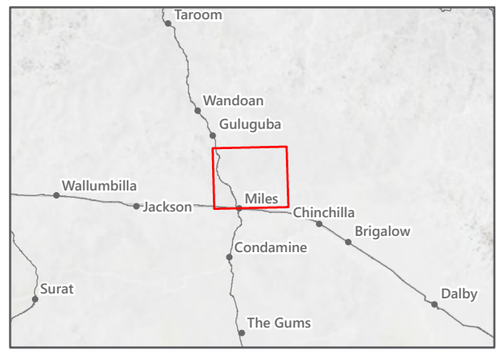
31AU60

32AU60

Rocky Creek
Bottle Tree Creek
Middle Gully
Tin Hut Creek
L Tree Creek
Mudwall Creek
Hellhole Creek
Seven Mile Creek
Nine Mile Creek
Colamba Creek
Cattle Gully
Punch Bowl Creek
Wallan Creek
Camisla Creek
Dogwood Creek
Jump Up Creek
Warlaw Creek
Columboola Creek
Akers Gully

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_031-034[A]



N

0 km 4

SCALE (A3): 1:135,000

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SGP NORTH SOLAR FARM

Offset Analysis- Glossy Black-Cockatoo

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Glossy Black Cockatoo Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

32AU60

Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_031-034[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Impact Area - Koala

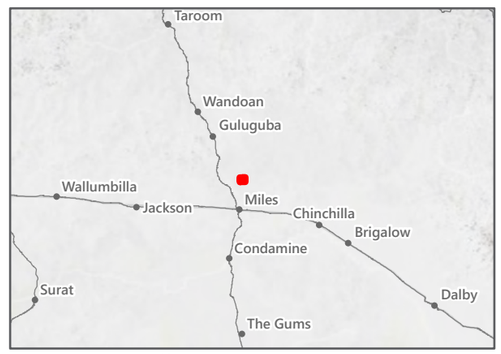
Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Koala Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_064-067[A]



N

0 m 500

SCALE (A3): 1:10,000

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SGP NORTH SOLAR FARM
Impact Area - Koala

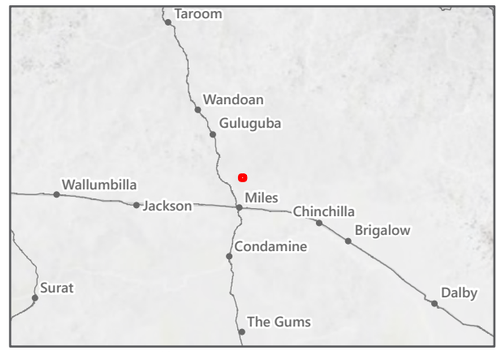


Connectedness

- Minor watercourse
- Impact area
- Lot boundary
- Koala Matter area
- Regrowth vegetation
- Non-remnant vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_064-067[A]



N

0 m 200

SCALE (A3): 1:5,000

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SGP NORTH SOLAR FARM

Impact Area - Koala

Site Context

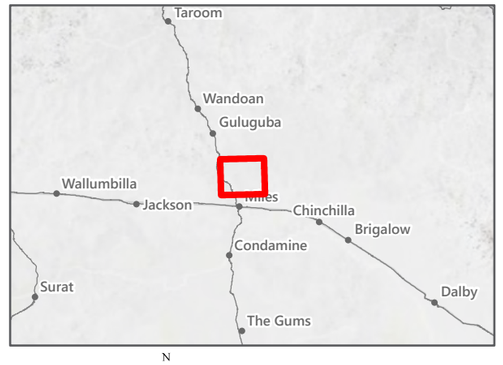
- Major watercourse
- Minor watercourse
- Impact area
- Lot boundary
- Koala Matter area
- Remnant vegetation

17AU199

Tin Hut Creek
L Tree Creek
Eleven Mile Creek
Bottle Tree Creek
Walan Creek
Walen Creek
Six Mile Gully
Dogwood Creek
Punch Bowl Creek
Jump Up Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_064-067[A]



N

0 m 3,000

SCALE (A3): 1:80,000

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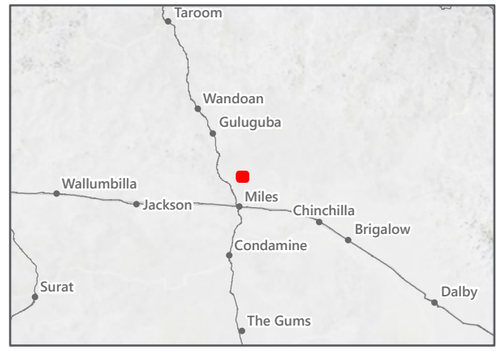
SGP NORTH SOLAR FARM

Impact Area - Koala

Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Koala Matter area
- State Ecological Corridor

17AU199



DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_064-067[A]

N

0 m 500

SCALE (A3): 1:12,500

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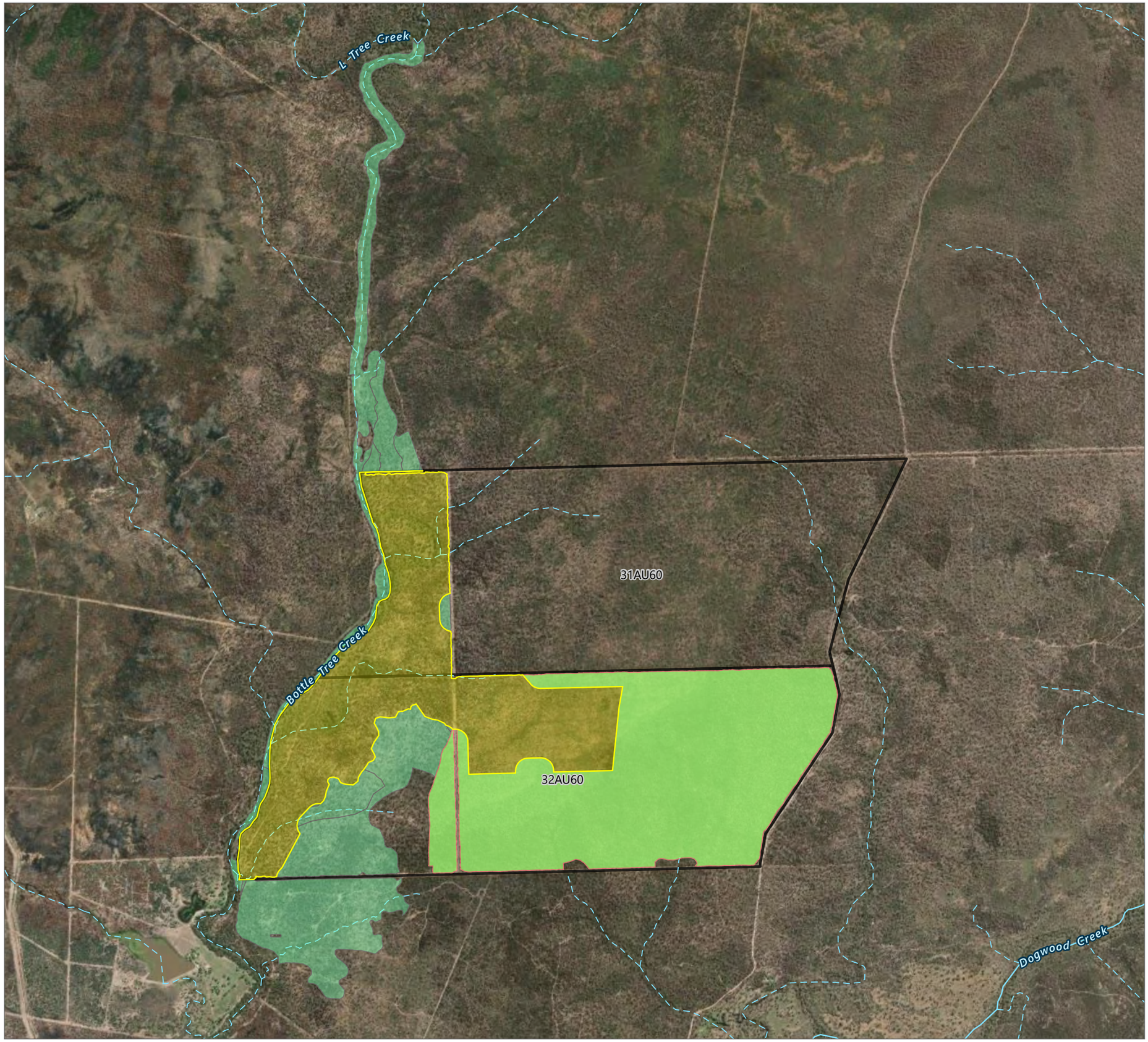
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SGP NORTH SOLAR FARM

Offset Analysis- Koala

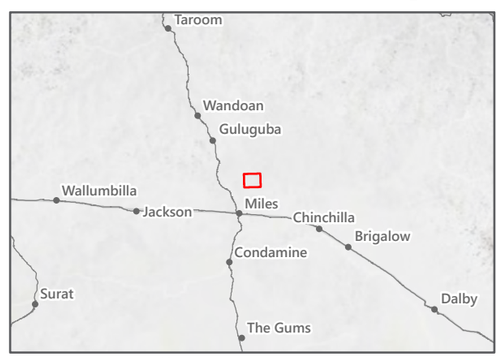
Size of Patch

- Major watercourse
- Minor watercourse
- Lot boundary
- Koala Matter area
- Remnant vegetation
- Regrowth vegetation



DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_046-050[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Koala

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Koala Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-Remnant vegetation

31AU60

32AU60

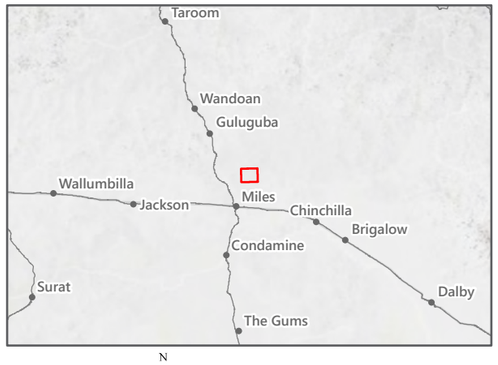
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_046-050[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis- Koala

Site Context

- Major watercourse
- Minor watercourse
- Lot boundary
- Koala Matter area
- Remnant vegetation

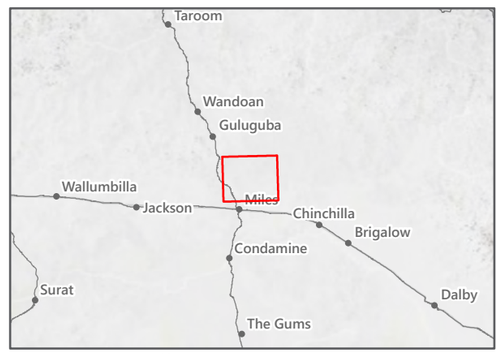
31AU60

32AU60

Middle Gully
Bottle Tree Creek
Tin Hut Creek
L Tree Creek
Mccaw Creek
Wongongera Creek
Colamba Creek
Eleven Mile Creek
Punch Bowl Creek
Walan Creek
Wallen Creek
Six Mile Gully
Dogwood Creek
Jump Up Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_046-050[A]



N

0 km 3

SCALE (A3): 1:100,000

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SGP NORTH SOLAR FARM

Offset Analysis- Koala

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Koala Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

32AU60

Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_046-050[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Impact Area - Dunmall's Snake

Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Dunmall's Snake Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 26/05/2026
DWG No: ARR-005_093-96[A]



N

0 m 500

SCALE (A3): 1:10,000

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SGP NORTH SOLAR FARM

Impact Area - Dunmall's Snake



Connectedness

- Minor watercourse
- Impact area
- Lot boundary
- Dunmall's Snake Matter area
- Non-remnant vegetation
- Regrowth vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 26/05/2026
DWG No: ARR-005_093-96[A]



N

0 m 200

SCALE (A3): 1:5,000

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SGP NORTH SOLAR FARM

Impact Area - Dunmall's Snake

Site Context

- Minor watercourse
- Impact area
- Lot boundary
- Dunmall's Snake Matter area
- Remnant vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 26/05/2026
DWG No: ARR-005_093-96[A]



N

0 m 500

SCALE (A3): 1:12,500

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SGP NORTH SOLAR FARM

Impact Area - Dunmall's Snake

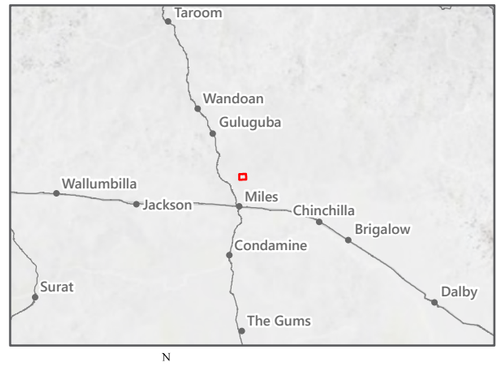


Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Dunmall's Snake Matter area
- State Ecological Corridor

DRAWN: JT/KB
REVIEWED: MW

DATE: 26/05/2026
DWG No: ARR-005_093-96[A]



N

0 m 500

SCALE (A3): 1:12,500

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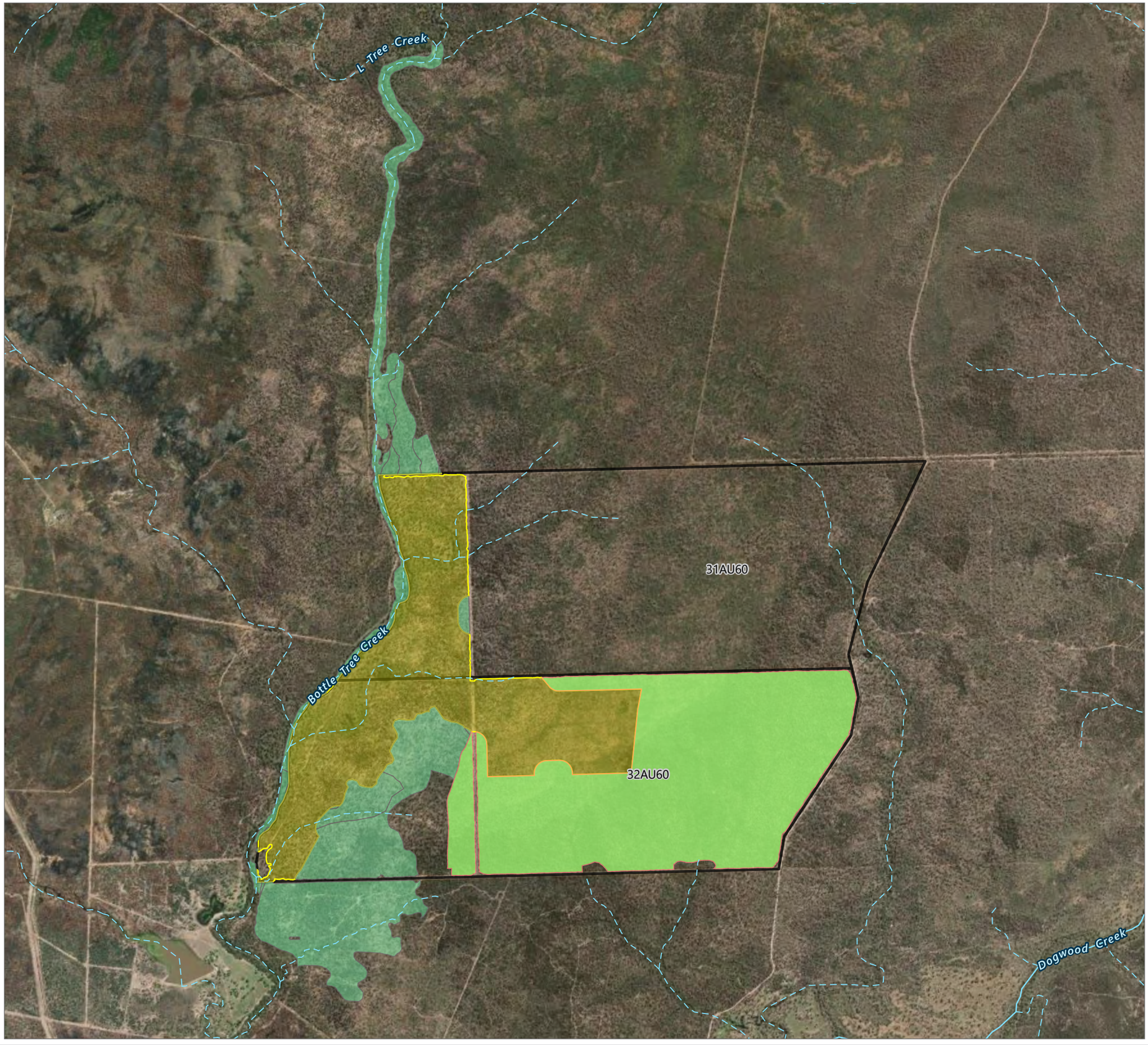
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SGP NORTH SOLAR FARM

Offset Analysis - Dunmall's Snake

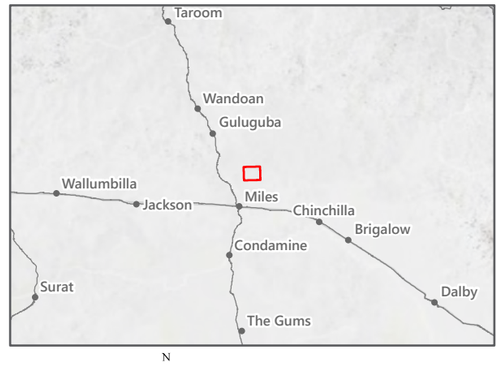
Size of Patch

- Major watercourse
- Minor watercourse
- Lot boundary
- Dunmall's Snake Matter area
- Remnant vegetation
- Regrowth vegetation



DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_100-103[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis - Dunmall's Snake

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Dunmall's Snake Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-Remnant vegetation

31AU60

32AU60

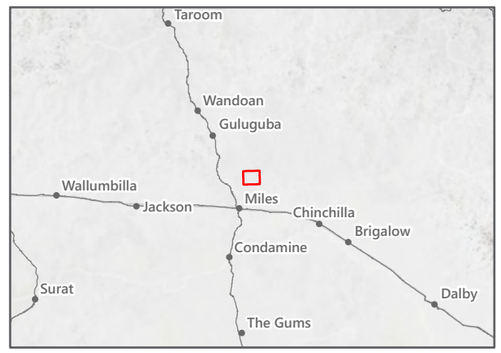
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_100-103[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis - Dunmall's Snake

Site Context

- Major watercourse
- Minor watercourse
- Lot boundary
- Dunmall's Snake Matter area
- Remnant vegetation

31AU60

32AU60

Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_100-103[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis - Dunmall's Snake

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Dunmall's Snake Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

32AU60

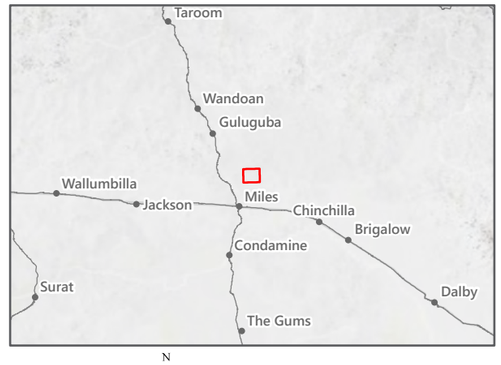
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_100-103[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Impact Area - Squatter Pigeon

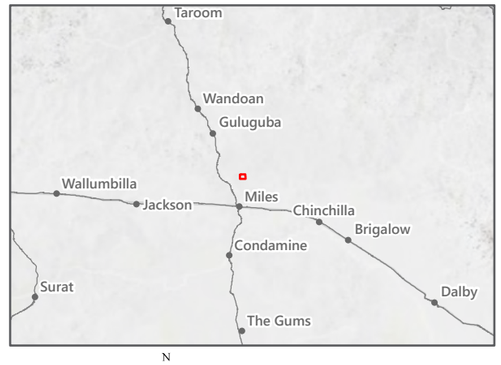
Size of Patch

- Minor watercourse
- Impact area
- Lot boundary
- Squatter Pigeon Matter area
- Remnant vegetation
- Regrowth vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_089-92[A]



N

0 m 500

SCALE (A3): 1:10,000

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SGP NORTH SOLAR FARM

Impact Area - Squatter Pigeon

Connectedness

- Minor watercourse
- Lot boundary
- Squatter Pigeon Matter area
- Regrowth vegetation
- Non-remnant vegetation

17AU199

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_089-92[A]



N

0 200

SCALE (A3): 1:5,000

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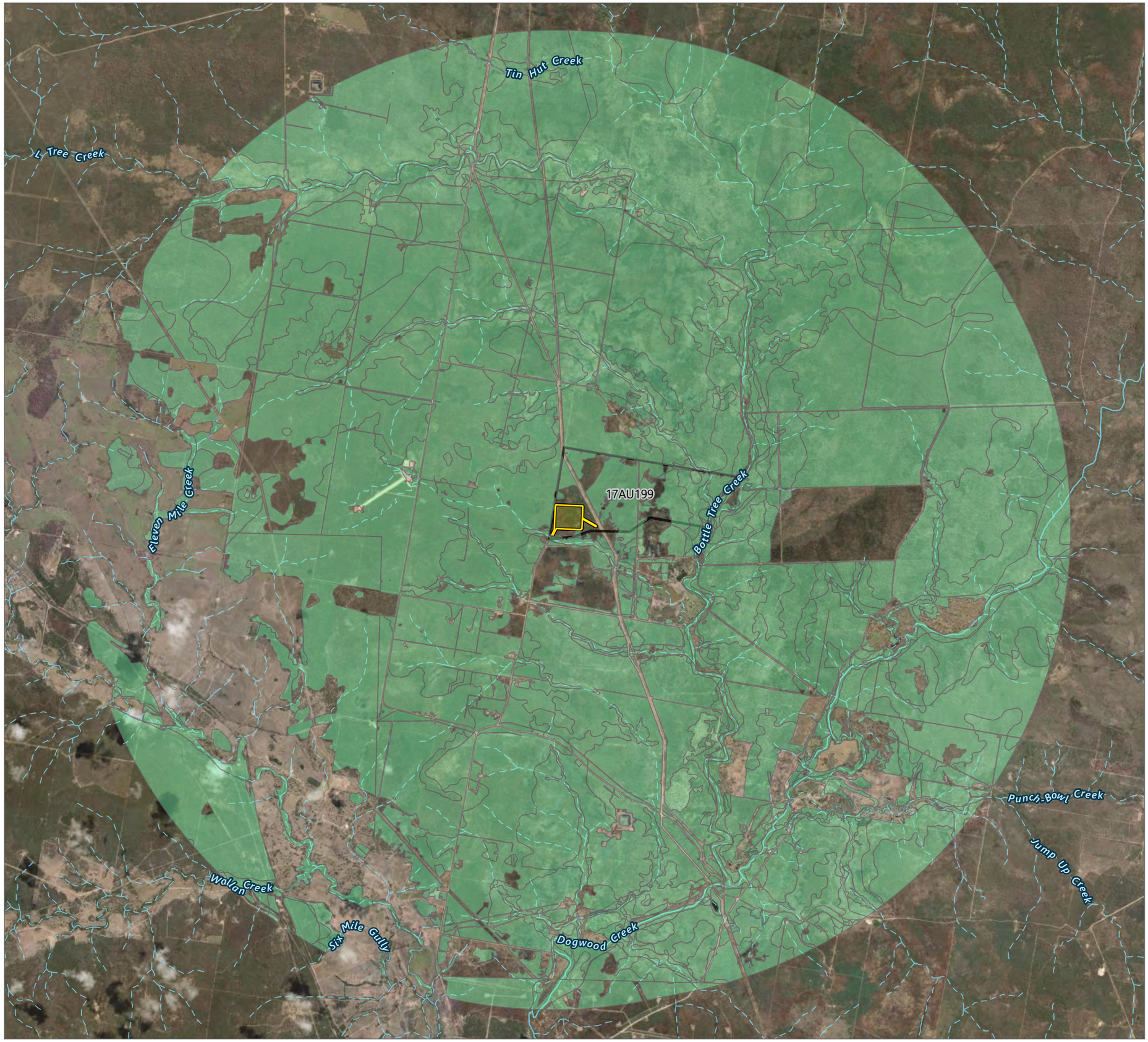
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SGP NORTH SOLAR FARM

Impact Area - Squatter Pigeon

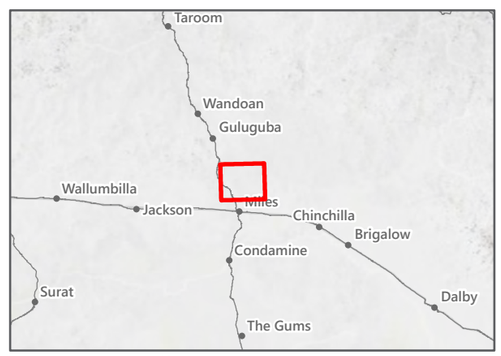
Site Context

- Major watercourse
- Minor watercourse
- Impact area
- Lot boundary
- Squatter Pigeon Matter area
- Remnant vegetation



DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_089-92[A]



N

0 3,000

SCALE (A3): 1:80,000

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SGP NORTH SOLAR FARM

Impact Area - Squatter Pigeon

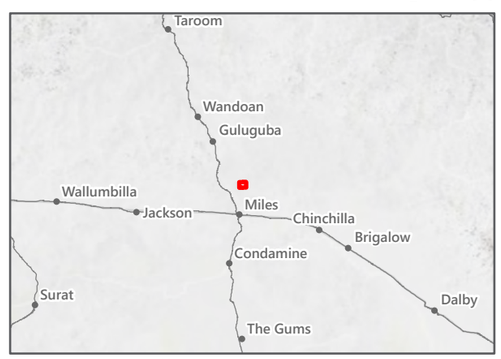
17AU199

Ecological Corridor

- Minor watercourse
- Impact area
- Lot boundary
- Squatter Pigeon Matter area
- State Ecological Corridor

DRAWN: JT/KB
REVIEWED: MW

DATE: 27/05/2026
DWG No: ARR-005_089-92[A]



N

0 500

SCALE (A3): 1:12,500

Attexo

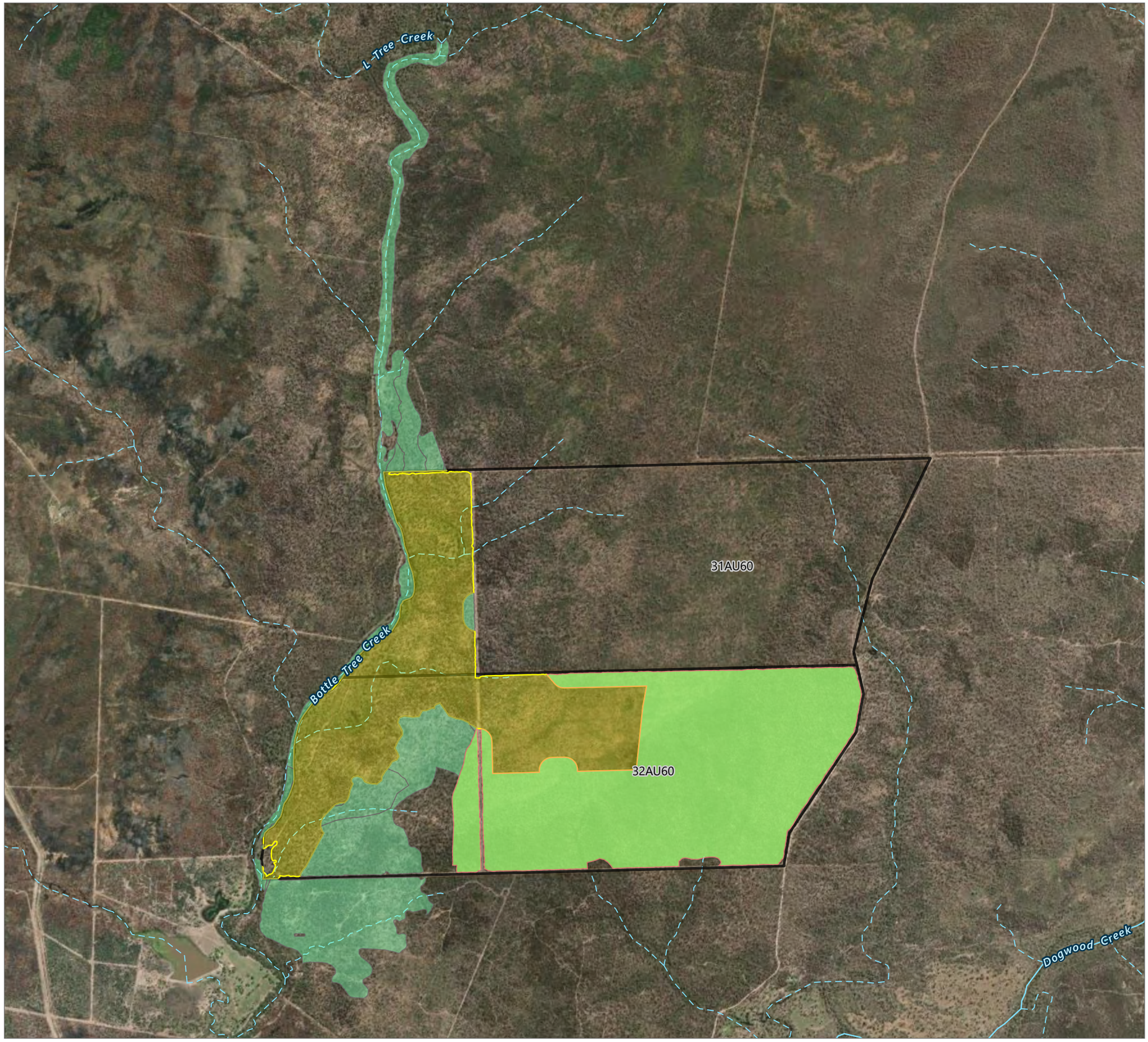
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SGP NORTH SOLAR FARM

Offset Analysis - Squatter Pigeon

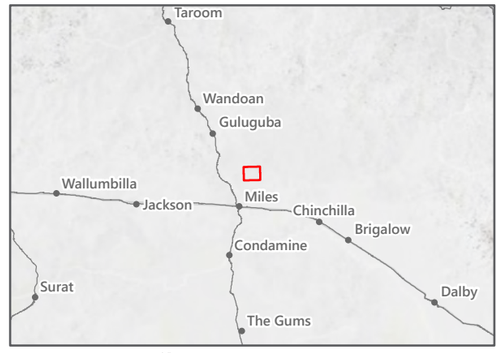
Size of Patch



- Major watercourse
- Minor watercourse
- Lot boundary
- Squatter Pigeon Matter area
- Remnant vegetation
- Regrowth vegetation

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_097-99[A]



N

0 km 1

SCALE (A3): 1:30,000

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SGP NORTH SOLAR FARM

Offset Analysis - Squatter Pigeon

Connectedness

- Major watercourse
- Minor watercourse
- Lot boundary
- Squatter Pigeon Matter area
- Remnant vegetation
- Regrowth vegetation
- Non-Remnant vegetation

31AU60

32AU60

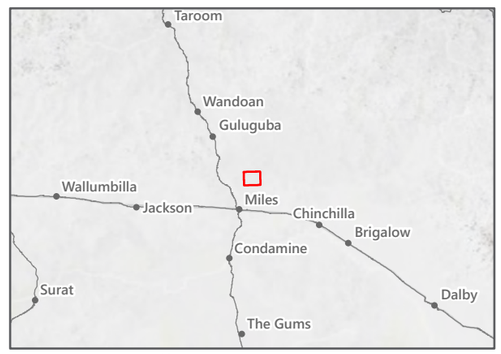
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_097-99[A]



N

0 km 1

SCALE (A3): 1:30,000

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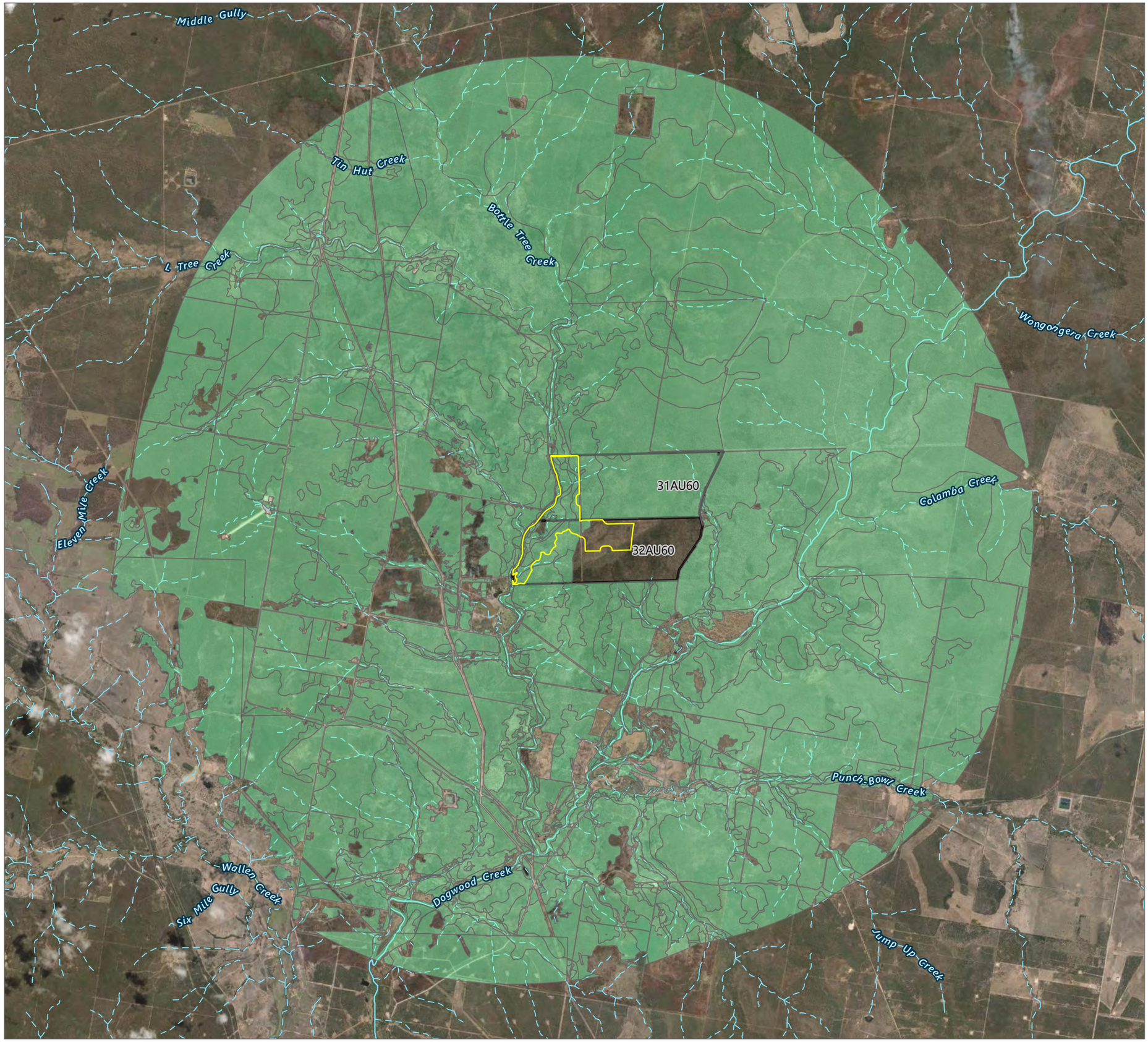
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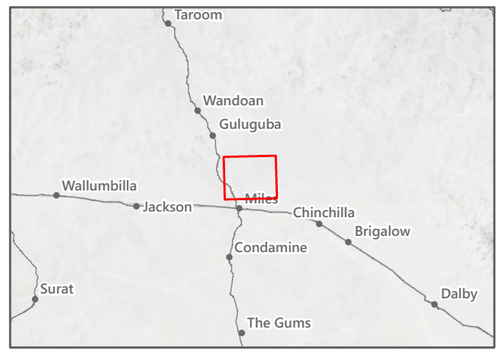
SGP NORTH SOLAR FARM

Offset Analysis - Squatter Pigeon

Site Context

- Major watercourse
- Minor watercourse
- Lot boundary
- Squatter Pigeon Matter area
- Remnant vegetation





N

0 km 3

SCALE (A3): 1:95,000

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_097-99[A]

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SGP NORTH SOLAR FARM

Offset Analysis - Squatter Pigeon

Ecological Corridor

- Major watercourse
- Minor watercourse
- Lot boundary
- Squatter Pigeon Matter area
- State Ecological Corridor
- Regional Ecological Corridor

31AU60

32AU60

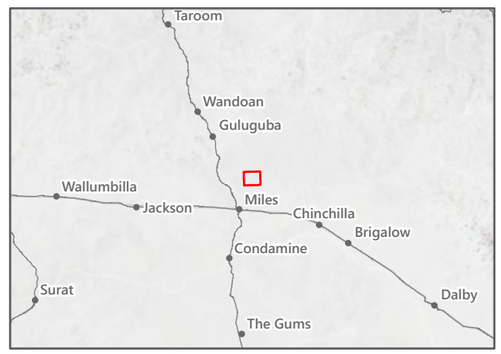
Bottle Tree Creek

Bottle Tree Creek

Dogwood Creek

DRAWN: JT/KB
REVIEWED: MW

DATE: 29/05/2026
DWG No: ARR-005_097-99[A]



N

0 km 1

SCALE (A3): 1:30,000

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