Environmental Offsets Strategy

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Horse Pit Extension Project – Caval Ridge Mine

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Definitions

Term	Definition
Areas of Interest	A shapefile provided by BMA indicating the area permitted to survey. The Area of Interest was surveyed for its suitability to acquit Project impacts on target protected matters.
Broad Vegetation Group	High-level groupings of vegetation communities and Regional Ecosystems in Queensland by Neldner et al. (2020).
Croydon Offset Area	The approximately 512.26 ha Offset Area within the Croydon Station. The Offset Area is a subset of the Area of Interest. The size of the Offset Area reflects the area (ha) and habitat values required to acquit HPE Project impacts on ornamental snake, squatter pigeon (southern) and MSES Connectivity Areas.
Habitat Quality Score	A method of evaluating habitat quality within a particular community based on key indicators including site condition, site context and species habitat index (if necessary). The method produces a score out of 10, where the maximum score of 10 represents a fully intact system. Scores of 4, 5 and 6 may indicate good quality regrowth or medium value habitat.
Inderi Offset Area	The approximately 66.61 ha area within the Inderi property (Lot 55 DSN318) to offset the HPE Project's offset obligations concerning king bluegrass and regulated vegetation.
Matters of National Environmental Significance	Environmental values protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. Significant impacts to these values may require offsets under the legislation.
Matters of State Environmental Significance	State interests defined under Schedule F of the Queensland State Planning Policy and include ecological features such as Regulated Vegetation, wetlands, fish habitat areas and threatened species habitat.
Study Area	The area within the Area of Interest as supplied by Inderi property and Croydon Station surveyed as part of the initial field assessments conducted by E2M.
Regional Ecosystem	A vegetation community in a bioregion that is consistently associated with a combination of geology, landform, and soil. Regional Ecosystems are described in the Regional Ecosystem Description Database, produced by the Queensland Herbarium.
Regulated Vegetation	Vegetation that is mapped within the regulated vegetation management map produced by Department of Natural Resources, Mines and Energy. The Queensland *Vegetation Management Act 1999* is applicable to regulated vegetation.
Remnant vegetation	Vegetation which forms the predominant canopy of the community that: a) covers more than 50% of the undisturbed predominant canopy; and b) averages more than 70% of the vegetation's undisturbed height; and c) is composed of species characteristic of the vegetation's undisturbed predominant canopy.

Term	Definition
Threatened species	Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) or Conservation Dependent (CD) under the *Environmental Protection and Biodiversity Conservation Act 1999* or extinct in the wild (PE), critically endangered (CE), endangered (E), vulnerable (V) or near threatened (NT) under the *Nature Conservation Act 1992*.
Vegetation community	An identified vegetation community (i.e. structure, composition, condition and/or underlying geology) verified from a field survey. Communities may include Regional Ecosystems, remnant vegetation and/or disturbed/novel ecosystems (e.g. parkland, disturbed roadsides etc.).

Abbreviations

Abbreviation	Description
AU	Assessment Unit
API	Aerial Photographic Interpretation
BOM	Bureau of Meteorology
BMA	BM Alliance Coal Operations Pty Ltd
BVG	Broad Vegetation Group
CVM	Caval Ridge Mine
DAWE	Commonwealth Government Department of Agriculture, Water and the Environment
DBH	Diameter at breast height
DCCEEW	Commonwealth Government Department of Climate Change, Energy, the Environment and Water
DEE	Commonwealth Government Department of the Environment and Energy
DES	Queensland Government Department of Environment and Science
DoR	Queensland Government Department of Resources
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (superseded in 2013)
E2M	E2M Pty Ltd
EA	Environmental Authority
EO Act	Queensland *Environmental Offset Act 2014*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information Systems
GPS	Global Positioning System

Abbreviation	Description
GTRE	Ground-truthed Regional Ecosystem
ha	Hectares
HPE	Horse Pit Extension Project
HVR	High-value Regrowth
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	*Nature Conservation Act 1992*
PMST	Commonwealth Protected Matters Search Tool database
RE	Regional Ecosystem
SAT	Spot Assessment Technique (method used to detect indirect koala evidence)
SIA	Significant Impact Assessment
SLR	SLR Consulting Pty Ltd
SO	Stream order
sp.	Singular species. For example, *Eucalyptus* sp. refers to a single species of *Eucalyptus*
spp.	Multiple species. For example, *Eucalyptus* spp. refers to multiple species of *Eucalyptus*
TEC	Threatened Ecological Community
the Project	Horse Pit Extension Project
VM Act	Queensland *Vegetation Management Act 1999*
WoNS	Weed of National Significance

1 Introduction

1.1 Background

The development of the BM Alliance Coal Operations Pty Ltd (BMA) Horse Pit Extension (HPE) Project at Caval Ridge Mine (CVM) is expected to have a significant, residual impact on five Matters of National Environmental Significance (MNES) and/or Matters of State Environmental Significance (MSES) (referred to collectively as 'target protected matters'):

- 167.84 ha of ornamental snake (*Denisonia maculata*) habitat;
- 83.53 ha of squatter pigeon (southern) (*Geophaps scripta scripta*) habitat;
- 23.40 ha of king bluegrass (*Dichanthium queenslandicum*) habitat;
- 23.40 ha of MSES Regulated Vegetation[1]; and
- 84.19 ha of connectivity area.

The impacts are expected to trigger offset requirements under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) Environmental Offsets Policy (DSEWPaC 2012) (Commonwealth Offsets Policy) and the Queensland *Environmental Offsets Act 2014* (EO Act).

Two potentially suitable Areas of Interest were proposed by BMA as a proponent driven, land based approach to offset the impact to the target protected matters. The Areas of Interest are located on the following properties:

- Lot 55 on Plan DSN318 (known as Inderi); and
- Lot 4 on Plan KL210 (known as Croydon Station).

To determine the suitability of the two Areas of Interest, E2M Pty Ltd (E2M) was engaged by SLR Consulting Pty Ltd (SLR) on behalf of BMA to conduct a terrestrial ecology assessment and prepare an Offset Strategy.

1.2 Purpose of this offset strategy

The purpose of this Offset Strategy is to:

- Present the results of the E2M terrestrial ecology assessment conducted within the Inderi property and Croydon Station;
- Discuss the overall suitability of the proposed offset areas to acquit the HPE Project's offset requirements by:
  - assessing each offset area against the offset requirements of the HPE Project in accordance with the EPBC Act Offsets Assessment Guide

[1] a native grassland community designated as Regional Ecosystem (RE) 11.8.11 within the Broad Vegetation Group (BVG) 30b[1]. RE 11.8.11 is listed as 'of concern' under the *Vegetation Management Act 1999*

- demonstrating the HPE Project's compliance with the Commonwealth and State environmental and offset legislation framework
- evaluating the anticipated environmental outcome; and
- outlining how the offset will be implemented.

1.3 Offset requirements and delivery mechanism

The HPE Project offset requirements and delivery mechanisms are summarised in Table 1.

Table 1. Offset requirements summary

Target protected matter	Status		Significant Residual Impact (ha)	Notional Offset Area required (ha)		Offset delivery mechanism
	EPBC Act	State		EPBC Act[2]	EO Act[1]	
ornamental snake (*Denisonia maculata*)	V	V	167.84	259.00	NA[4]	Land-based offset
squatter pigeon (southern) *Geophaps scripta scripta*	V	V	83.53	228.00	NA[4]	Land-based offset
king bluegrass (*Dichanthium queenslandicum*)	E	V	23.40	33.00	NA[4]	Land-based offset
MSES Regulated Vegetation	NA	of concern	23.40	NA	34.00[3]	Land-based offset
connectivity area	NA	NA	84.19	NA	84.19	Land-based offset

[1] Queensland *Environmental Offsets Act 2014*

[2] Based on the EPBC offset calculator using site-based attributes (BioCondition scores)

[3] Based on the EO Act land-based offsets multiplier calculator

[4] See section 1.4 Duplication of offsets

1.4 Duplication of offsets

Three of the target protected matters (ornamental snake, king bluegrass and squatter pigeon (southern)), are listed under both Commonwealth and State legislation. The Queensland EO Act specifies that the State Government cannot impose an offset condition for the same, or substantially the same, impact if the Commonwealth has completed its assessment for a controlled action. As per Section 15 of the Queensland EO Act, an administering agency may impose an offset only if:

- The same impact, or substantially the same impact, has not been assessed under a Commonwealth Act; and
- The same prescribed matter, or substantially the same prescribed matter, has not been assessed under a relevant Commonwealth Act.

Ornamental snake, king bluegrass and squatter pigeon (southern) impact assessment and offset considerations (including the notional offset area required) are determined in accordance with the Commonwealth EPBC Act and offset framework. Consequently, additional offsets are unlikely to also be imposed under the State for those matters.

2 Offset Area Survey Methods

The ecological values of the two Areas of Interest were identified through a desktop assessment and a field survey conducted in accordance with the recommended guidelines prescribed by the relevant Commonwealth and/or State governments. The following section details the methods employed to conduct both the desktop and the field assessments.

Following completion of field studies, a suitable subset area within each Area of Interest was identified to acquit MNES and MSES values impacted by the HPE Project. These subset areas are referred to as the Inderi Offset Area and the Croydon Offset Area.

2.1 Desktop assessment

The desktop assessment consolidated information from relevant databases, mapping, aerial imagery and published literature to produce an initial characterisation of the ecological values of the Area of Interest and surrounding landscape. In part, this initial characterisation guides the assessment strategy required in the field by providing information such as previously recorded threatened species, potential habitat features and mapped vegetation communities.

The desktop assessment sourced information from the:

- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) EPBC Act Protected Matters Search Tool (PMST) Database (2022);
- Regulated Vegetation Management mapping and associated RE mapping (i.e. Vegetation Management Supporting Map) (Version 11), including Essential Habitat Mapping (Department of Resources (DoR) 2021);
- Queensland MSES mapping (Department of Environment and Science (DES) 2019a);
- DES WildNet databases for species listed under the *Nature Conservation Act 1992* (NC Act) (DES 2020b; DES 2018)
- Atlas of Living Australia (2021);
- GeoScience Australia 1:100,000 drainage network of Queensland (Geoscience Australia 2020);
- DoR Detailed Surface Geology (2020) descriptions to confirm DES Land zone definitions; and
- historical and latest available aerial photography (Queensland Government Q-Imagery) (NearMap 2020).

Where necessary, a search radius of 20 km from the approximate centre point of the Area of Interest; Inderi (-24.3238; 148.4711) and Croydon (-22.3888; 148.9440); was applied to the desktop search databases.

Preliminary vegetation mapping was also undertaken by way of Aerial Photographic Interpretation (API). API allows for accurate vegetation community mapping at a property scale as well as the accurate delineation of heterogenous polygons mapped by DoR into homogenous polygons of REs. Based on the preliminary mapping, suitable representative sites were identified for each vegetation community to inform the field survey. This process also identified key areas to target during the field survey to verify the correct RE classification as well as undertake Habitat Quality Assessments.

2.2 Field assessment

Field surveys were conducted to identify and characterise the presence, extent and condition of the target protected matters within the two Areas of Interest at the Inderi property and Croydon Station. The methods employed adhere to the guidelines and methodologies prescribed or supported by the Commonwealth and State Governments.

2.2.1 Ground-truthed Regional Ecosystems

Ground-truthed Regional Ecosystems (GTREs) are vegetation communities that have been field verified in accordance with the Queensland *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al. 2022). Neldner et al. (2022) also prescribes the method for determining remnant status of woody and non-woody vegetation communities using a series of metrics collected in the field (e.g. canopy cover, height, species composition, cultivation status,non-native species).

The structural form of vegetation was determined using the Specht vegetation classification system (Specht 1970) which defines structural forms of vegetation in terms of the dominant plant form and the percentage of foliage cover of the tallest plant layer.

2.2.1.1 Broad vegetation group

BVGs are higher-level groupings of vegetation communities assessed at the 1:1,000,000 mapping scale[2] and based on Neldner et al. (2021) and the Regional Ecosystem Description Database (REDD) (Queensland Herbarium, 2021).

The *Queensland Environmental Offset Policy* (DES, 2021) permits a suitable offset for MSES Regulated Vegetation to be of the same BVG (rather than the same RE) as the impacted RE. In addition, a suitable offset for MSES Regulated Vegetation must be:

- of the same RE status based on the Queensland *Vegetation Management Act 1999* class (e.g. 'endangered' or 'of concern'); and
- within the same bioregion (Bioregion 11);

2.2.2 Habitat quality assessments

Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (referred to as the Habitat Quality Guide) (DES 2020). The Habitat Quality Guide incorporates landscape scale data, site-based vegetation attribute data (using the BioCondition assessment framework (Queensland Herbarium 2015) and fauna species-specific habitat data.

2.2.2.1 Landscape-scale Attributes

An assessment of landscape-scale attributes is required to determine if the proposed Area of Interest is situated in a landscape that can achieve a conservation outcome (i.e. suitably connected and contains large tracts of vegetation). In accordance with the Habitat Quality Guide, the Areas of Interest were assessed against the criteria summarised in Table 2.

[2] Under the Queensland *Environmental Offsets Policy* (DES), 2021

Table 2. Landscape-scale attributes assessment criteria within a fragmented subregion

Attribute	Description	Assessment extent	Maximum score
Size of patch	The size of the patch assessed and associated directly with connecting remnant vegetation	-	10
Connectedness	The proportion of the site's boundary that is connected to remnant vegetation	-	5
Context	The percentage of remnant and regrowth vegetation within a 1 km buffer of the site	1 km buffer	5

2.2.2.2 Site-based Attributes

Site-based attribute data were collected within 100 x 50 m areas (including various sub-plots) at sampling sites within each assessment unit and compared to BioCondition benchmark values (Queensland Herbarium, 2019). A summary of the site-based attributes assessed, plot area and associated maximum score is summarised in Table 3. The number of BioCondition survey sites within each assessment unit adhered to the Habitat Quality Guide recommendations summarised in Table 4.

A Trimble TDC600 Global Positioning System (GPS) device was used to record the mid-point location (50 m mark) of each BioCondition survey site.

Table 3. Site-based attributes assessment criteria

Attribute	Description	Assessment plot	Maximum score
Large trees	Number of large trees per hectare, as determined by exiting BioCondition benchmarks for the associated RE	100 m x 50 m	15[†]
Tree canopy height	Median canopy height in metres of the ecologically dominant layer.	100 m x 50 m	5[†]
Recruitment (%)	The proportion of overstorey species present at a site that are regenerating (<5 cm diameter at breast height (DBH))	100 m x 50 m	5[†]
Tree canopy cover (%)	Vertical projection of the tree canopy crown cover along a transect	100 m transect	5[†]
Shrub layer cover (%)	Vertical projection of the shrub layer cover of native shrubs	100 m transect	5[†]
Coarse woody debris	The length of fallen woody logs and other coarse woody debris (>10 cm diameter and >0.5 m in length) per hectare	50 m x 20 m	5[†]
Native plant species richness	Native plant species richness, comprising all life forms (i.e. trees, shrubs, grasses and forbs/other)	100 m x 50 m (trees) 50 m x 10 m (shrubs, grasses, forbs/other)	5 each (20 total)
Non-native plant cover	Percentage cover of non-native/weed plant species	50 m x 10 m	10

Attribute	Description	Assessment plot	Maximum score
Native perennial grass cover (%)	Average percentage cover of native perennial grass species	Five 1 m x 1 m	5
Organic litter cover	The average percentage cover of organic material such as fallen leaves, twigs, and branches <10 cm diameter	Five 1 m x 1 m	5

† do not apply to grasslands RE's

Table 4. BioCondition survey effort guidelines[1]

Assessment unit size (ha)	Suggested number of sampling sites
0-50	2
50-100	3
100-500	4
500-1000	5
>1000	6

[1] Guide to determining terrestrial habitat quality (DES 2020)

2.2.2.3 Fauna species-based attributes

In accordance with the Habitat Quality guide, targeted fauna species habitat assessments were conducted to provide further information regarding the habitat suitability independent of site-based attribute assessments. The fauna species-based attributes consider threatening processes and survey microhabitat features (aka indicators) essential to the target fauna species: ornamental snake and squatter pigeon (southern). These features include:

- abundance of gilgai;
- RE and condition (e.g. remnant, regrowth, non-remnant);
- vegetative ground cover;
- gilgai depth;
- soil crack abundance;
- soil crack depth;
- permanent and ephemeral water sources;
- presence and proximity to water;
- abundance of coarse woody debris;
- leaf litter abundance;
- litter depth; and
- threat abundance.

Each indicator was scored on a scale from 0 (absent) to 25 (very high) and used to calculate a weighted score. A total species habitat score (out of 10) was calculated for the ornamental snake (Appendix B).

2.2.3 Flora and fauna habitat values

2.2.3.1 King bluegrass (*Dichanthium queenslandicum*)

Random meander surveys for king bluegrass (*Dichanthium queenslandicum*) were conducted in suitable habitat within the Inderi property Area of Interest (i.e. RE 11.8.1 and RE 11.8.5) based on methods described by Cropper (1993) and Goff et al. (1982). The random meander technique involves traversing potential habitat within an area and searching for flora species that may not have been located using more structured search methods (e.g. BioCondition assessment). This technique is particularly suitable for locating species that typically occur at very low densities or that may be distributed in isolated clumps.

King bluegrass is a perennial species and has been observed seeding throughout the year (DES, 2022). Although conditions at the time of the survey were dry, the species was recorded within suitable habitat within the Area of Interest. King bluegrass locations were recorded, and samples of the specimens were collected and sent to the Queensland Herbarium for formal identification.

2.2.3.2 Ornamental snake (*Denisonia maculata*)

In accordance with the Commonwealth *Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* (DSEWPaC 2011a) and the *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPaC 2011b), the most effective ornamental snake detection method is nocturnal spotlighting. The species is most active during the wet season when warm weather and inundated gilgai attract the ornamental snake's main prey, frogs. During the dry season however, ornamental snake activity above ground is limited and the species can remain inactive in shelter sites and soil cracks for long periods (e.g. months) (DSEWPaC 2011b).

As the Croydon Station field surveys occurred during the dry season (May 2021 and April 2022) (i.e. outside the survey window for species detection) ornamental snake habitat was (refer to Section 2.2.2.3) delineated based on the presence of suitable habitat features.

2.2.3.3 Squatter pigeon (southern) (*Geophaps scripta scripta*)

In accordance with the *Survey Guidelines for Australia's Threatened Birds* (DEWHA, 2010) and *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al., 2018), targeted surveys within Croydon Station Area of Interest comprised:

- species habitat assessments;
- water source watches;
- diurnal active searches; and
- opportunistic surveys.

The two field surveys (May 2021 and April 2022) coincided with optimal detection periods when squatter pigeon are most actively foraging for grass seed (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2022).

2.2.4 Additional ecological values

In addition to assessments for target protected matters requiring offsets for the HPE Project, the survey also considered the potential for other MNES and MSES within the Areas of Interest. A summary of these additional assessments for MNES and MSES values is provided in Section 2.2.4.1.

2.2.4.1 Threatened Ecological Community assessments

TEC assessments were conducted within relevant vegetation communities using the key diagnostic characteristics and condition thresholds published within the respective Commonwealth approved listing advice.

2.2.4.1.1 Natural Grasslands TEC

The Commonwealth approved listing advice for the Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC (Natural Grasslands TEC) lists seven REs, including RE 11.8.11, with the potential to support the TEC. To qualify as a Natural Grassland TEC, the Commonwealth listing advice (TSSC 2009) identifies the following diagnostic characteristics:

- a sparse or absent tree canopy (<10% projective crown cover);
- a sparse shrub layer (<50% projected crown cover); and
- the dominance of perennial native grasses and the presence of at least three (of 13) indicator species.

Condition thresholds further categorise Natural Grassland TECs into 'best' and 'good quality' as there are very few patches of undisturbed native grasslands remaining and most patches have some degree of disturbance and degradation (Table 5).

Table 5. Condition thresholds for the Natural Grasslands TEC

Criteria*	Best quality	Good quality
Patch size	At least 1 ha	At least 5 ha
Grasses	At least 4 native perennial grass species from the list of perennial native grass indicator species	At least 3 native perennial grass species from the list of perennial native grass indicator species
Tussock cover	At least 200 native grass tussocks	At least 200 native grass tussocks
Woody shrub cover**	Total projected canopy cover of shrubs is less than 30%	Total projected canopy cover of shrubs is less than 50%
Introduced species	Perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.	Perennial non-woody introduced species are less than 30% of the total projected perennial plant cover.

* All five criteria must be met

** The shrub layer is typically absent. However, where shrubs are present, they are defined as woody plants, more than 0.5 m tall that occupy the mid vegetation layer. The upper, or tree canopy layer, also is typically absent but may comprise scattered trees to less than 10% projective crown cover.

Sampling would be based upon a quadrat size of 0.1 ha (e.g. 50 m x 20 m) selected in an area with the most apparent native perennial grass species. Unless exceptional circumstances apply, to maximise the assessment of condition, sites must be assessed during a good season, two months after cessation of disturbance (fire/grazing/mowing/slashing) and within two months of effective rain.

2.2.4.1.2 Brigalow TEC

The Commonwealth Approved Conservation Advice for the Brigalow TEC (*Acacia harpophylla* dominant and co-dominant) (Department of the Environment (DotE) 2013) provides the key diagnostic criteria a vegetation community must meet to be considered a TEC. These criteria comprise:

- *Acacia harpophylla* is either dominant or co-dominant;
- is located in one of 16 REs (which includes 11.4.8 and 11.4.9);
- patch size of ≥0.5 ha; and
- weeds comprise <50% total vegetation cover.

A brigalow vegetation community may also be considered a TEC if the vegetation class is regrowth pending species composition and structural elements are broadly consistent with an RE and the vegetation meets the condition criteria. Regrowth vegetation in poor condition however, should be excluded from the TEC (Butler 2007). Poor condition patches have one or more of the following attributes:

- has been comprehensively cleared (not just thinned) within the last 15 years;
- weed cover ≥ 50%; and
- patch size ≤ 0.5 ha.

2.2.4.2 Opportunistic observations

Opportunistic surveys were also undertaken during the field assessments. Opportunistic observations included recording pest species, namely restricted biosecurity species identified under the Queensland *Biosecurity Act 2014* (Biosecurity Act) and Weeds of National Significance (WoNS), as these can be a threatening process for the target MNES and MSES. Estimated weed densities were categorised based on the following densities:

- scattered - 1-2 individuals/10 m^2;
- low - 3-4 individuals/10 m^2;
- moderate - 5-6 individuals/10m^2; and
- high - >7 individuals/10m^2.

Additional opportunistic surveys were undertaken to identify threatened species (including MNES and MSES) or indirect signs (i.e. bones, hair traces, tracks, scats, diggings, burrows, nests, skins) that could indicate presence throughout the Areas of Interest. These observations were made whilst traversing through the Areas of Interest both on foot and through slow vehicle drives.

2.2.5 Survey limitations and assumptions

Ecological surveys have a range of inherent limitations associated with seasonal timing of the survey, variable climate conditions and species behaviour. The survey conducted represents a "snapshot" in time and may not provide a true indication of presence or absence of flora and fauna species within the survey areas. In particular, grassland flora variability due to natural factors such as climate, can cause large and seasonal fluctuations in species dominance and cover in grassland communities (Wilson et al. 2002).

The values of the 'Notional Offset Area Required' presented in this report are based on the output of the EPBC Act Offset Assessment Guide (Department of Environment and Energy, 2012) and the EO Act land-based offset multiplier calculator (Department of Environment and Heritage Protection, 2014).

3 Inderi Offset Area Description

3.1 Property details

The Inderi property (formally Lot 55 on Plan DSN318) supports 1,800 to 2,000 head of cattle across 3,033.52 ha of natural grasslands, open woodlands and stands of leucaena (*Leucaena leucocephala*) on gently undulating rises. The property is located approximately 20 km northwest of the township of Rolleston and 242 km south of the Caval Ridge Mine (Figure 1).

The Inderi property is proposed as a proponent-driven, land-based offset and investigated specifically for its potential to acquit the HPE Project impacts to:

- *Dichanthium queenslandicum* habitat (MNES); and
- Regulated Vegetation containing 'of concern' RE 11.8.11 (BVG 30b) (MSES).

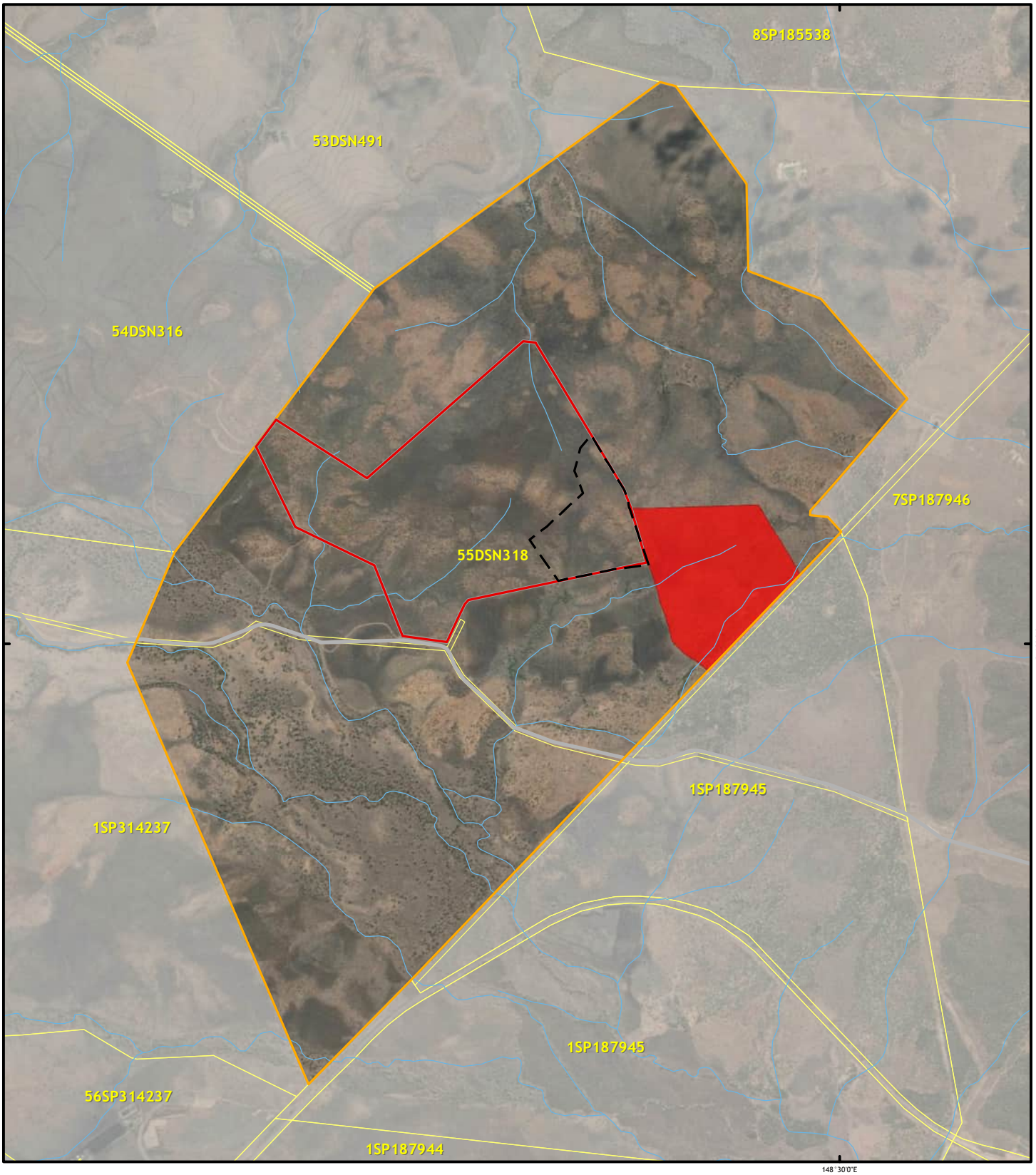
The Inderi property already supports three other offset areas (two in progress and one established) including a 137.2 ha BMA offset (secured in 2014) for values associated with the Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin Threatened Ecological Community (MNES).

3.1.1 Inderi Offset Area

Offset suitability assessments were completed by E2M across the Inderi Area of Interest. Following the completion of the field surveys and identification of target protected matters, a subset of the Area of Interest (i.e. Inderi Offset Area) was then determined based on the availability of suitable habitat and vegetation to acquit associated offset requirements for *Dichanthium queenslandicum* (MNES) and Regulated Vegetation containing 'of concern' RE 11.8.11 (BVG 30b) (MSES). The Inderi Offset Area spans 67 ha and is strategically located amongst the other three for a cumulative environmental benefit (Figure 1).

Table 6. Inderi Offset Area details

Property name	Inderi
Lot on Plan	Lot 55 DSN318
Tenure	Freehold
Primary LGA	Central Highlands Regional Council
Planning Scheme Zone	Rural
Property area	3,033.52 ha
Offset area	The Inderi Offset Area spans 66.61 ha and will acquit: • The area required to offset regulated vegetation (BVG30b) under the Queensland EO Act using the Land-based Offsets Multiplier Calculator is 34 ha of non-remnant RE 11.8.11; and • The area required to offset EPBC Act obligations is 33 ha (king bluegrass habitat)
Legally binding mechanism	Voluntary Declaration (*Vegetation Management Act 1999*)



Legend

- Road
- Watercourse
- Cadastre
- Offset Property
- Inderi Offset Area
- E2M Study Area
- Existing BMA Offset Category A Area (2014)

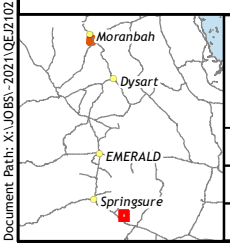
N

Scale 1:50,000 (A4)

0 1 2

Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
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Watercourse: © DNRME 2020
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Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	06/03/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 1: INDERI STUDY AREA AND OFFSET AREA

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_1_Inderi_Property.mxd

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3.2 Desktop results

The desktop assessment identified the following environmental matters potentially occurring within or in proximity (20 km) of the Inderi Offset Area:

- MNES identified under the EPBC Act, including:
  - Six TECs, including:
    - Natural Grassland TEC;
    - Brigalow TEC;
    - Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions;
    - Poplar Box Grassy Woodland on Alluvial Plains;
    - Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions; and
    - Weeping myall woodlands
  - 23 threatened flora and fauna species, including the targeted king bluegrass (*Dichanthium queenslandicum*) and ornamental snake (*Denisonia maculata*); and
  - Listed migratory species
- MSES identified under the EO Act; including:
  - Regulated Vegetation, comprising:
    - Of Concern prescribed REs (BVG 30b and 17a);
    - prescribed REs intersecting a watercourse; and
  - Essential habitat for ornamental snake (*Denisonia maculata*) and king bluegrass (*Dichanthium queenslandicum*).

3.3 Existing environment

3.3.1 Survey conditions

The Inderi Offset Area was surveyed by two ecologists on the 10th and 11th May 2021. Survey conditions during the field survey were dry, with temperatures ranging from 11.4˚C to 31.5˚C[2]. Below average rainfall was recorded during the three-month period (i.e. February, March and April) preceding the field survey, recording a total of 67.6 mm (Bureau of Meteorology[3] (BOM) 2021). As such, conditions for identification of annual groundcover species, including grass and forb species, were not considered optimal.

[3] Rolleston Airport weather station 035129

3.3.2 Vegetation communities

3.3.2.1 Inderi Offset Area

A total of three REs were identified within the Inderi Offset Area, comprising remnant, regrowth and non-remnant vegetation. A summary of REs, vegetation type, associated BVG, field survey description and extent are provided in Table 7 and depicted in Figure 2. The majority of the Offset Area was found to contain remnant and non-remnant grasslands consistent with RE 11.8.11 (172.71 ha) and eucalypt sparse open woodlands, characteristic of RE 11.8.5 (183.43 ha).

3.3.2.2 Inderi Offset Area

Within the Inderi Offset Area, a total of three REs were identified, comprising remnant and non-remnant vegetation. The non-remnant grasslands, consistent with RE 11.8.11, were dominated by introduced species, including buffel grass (*Cenchrus ciliaris**), red natal grass (*Melinis repens**) and parthenium (*Parthenium hysterophorus**). Associated native species included *Dichanthium* spp., *Aristida* spp., *Iseilema vaginiflorum*, *Eriochloa crebra* and *Panicum decompositum*.

Remnant RE 11.8.5 areas were observed on undulating rises and upper slopes. These areas were dominated by mountain coolabah (*Eucalyptus orgadophila*) with associated red bloodwood (*Corymbia erythrophloia*) with a sparse shrub layer comprising *Bursaria incana* and *Grewia* spp. The ground layer comprised a combination of the introduced and native grass species.

A small area of non-remnant RE 11.3.3a was also observed within the Inderi Offset Area in association within ephemeral drainage lines. This community was dominated by black tea tree (*Melaleuca bracteata)* occurring on heavy clays/loams. The ground layer was dominated by introduced and native grasses similar to species observed within non-remnant RE 11.8.11.

Table 7. Ground-truthed REs within the Inderi property Offset Area

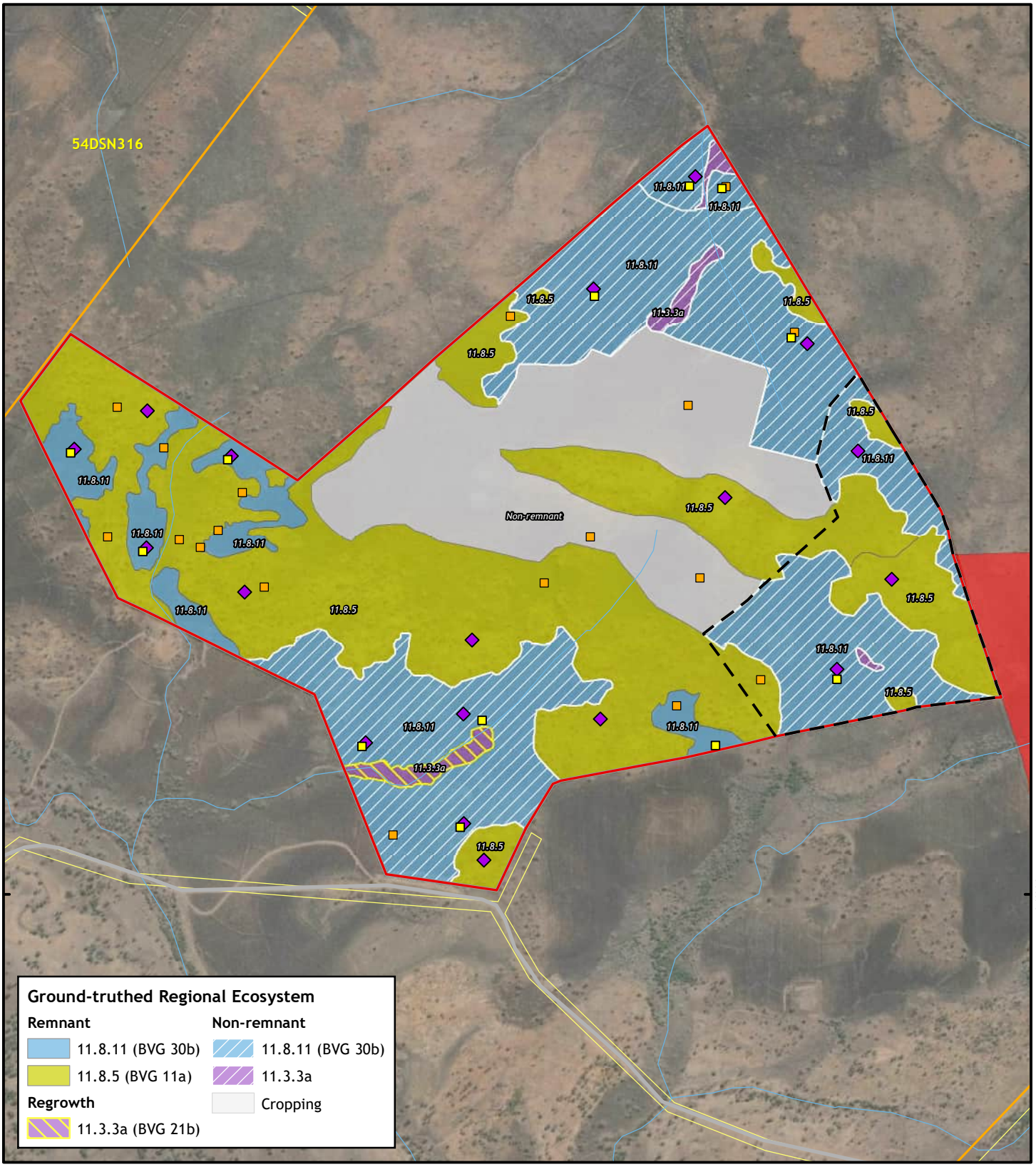
RE	BVG	VM Act[1] class	Field description	Vegetation type	Total area (ha) within Inderi Offset Area
11.3.3a	21b	OC	• Regrowth *Melaleuca bracteata* woodland (8 m) with *Acacia salicina* and *Eremophila mitchellii* along an unnamed drainage (SO1) within the southern part of the Area of Interest • The sparse shrub layer consisted of juvenile canopy species with *Carissa ovata, Grewia latifolia,* and *Capparis canescens.* • Native grass species present in the ground layer were similar to that of the adjacent natural grasslands and included multiple species in the genus *Aristida, Sporobolus* and as *Bothriochloa ewartiana* and *Enteropogon acicularis.*	Regrowth	0
				Non-remnant	0.32
11.8.5	11a	LC	• *Eucalyptus orgadophila* and *Corymbia erythrophloia* with *Bursaria incana* open woodland (14 m) on basalt derived plains (Photo 1). • Sparse shrub layer consisting of juvenile canopy species and *Grewia latifolia* • The ground layer comprised a combination of native and exotic grass species including Dichanthium species, *Heteropogon contortus*, *Aristida leptopoda, Eriochloa crebra and Melinis repens*, Cenchrus ciliaris* and Parthenium hysterophorus*.*	Remnant	26.78
11.8.11	30b	OC	• Natural grassland composed of native grass species across gently undulating rises (Photo 2). Emergent trees and shrubs were absent from the grassland. Ground cover was sparse to very sparse at the time of survey (due to dry survey conditions). • Native grass species include: *Dichanthium species, Aristida leptopoda, Aristida latifolia, Panicum decompositum, Heteropogon contortus, Eriochloa* spp., *Enneapogon* spp., *Bothriochloa* spp., *Digitaria* spp., *Tragus australianus* and *Iseilema vaginiflorum.*	Remnant	0
				Non-remnant	39.83

RE	BVG	VM Act[1] class	Field description	Vegetation type	Total area (ha) within Inderi Offset Area
			• The vegetation classification was non-remnant due to the non-native species cover. Non-native species include: *Parthenium hysterophorus** was present at low densities (likely underestimated due to dry condition), *Cenchrus ciliaris** (low to dense ground cover), *Melinis repens** and *Setaria parviflora**.		

[1] Vegetation Management Act class: E – Endangered; OC – Of Concern; and LC – least concern

Photo 1. Mountain coolabah (*Eucalyptus orgadophila*) and red bloodwood (*C. erythrophloia*) woodland within the Inderi Offset Area (RE 11.8.5)

Photo 2. Natural grasslands characteristic of RE 11.8.11 within the Inderi Offset Area



Legend

- Road
- Watercourse
- Cadastre
- Offset Property
- Inderi Offset Area
- E2M Study Area
- Existing BMA Offset Category A Area (2014)
- TEC Assessment Site
- Biocondition Site
- Quaternary Site

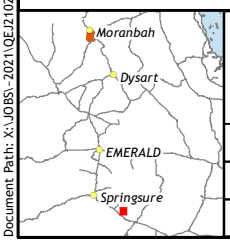
N

Scale 1:20,000 (A4)

0 1

Kilometres

Coordinate System: GCS GDA 1994



Notes:
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Watercourse: © DNRME 2020
Road: © DNRME 2020

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	06/03/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 2: INDERI GROUND-TRUTHED REGIONAL ECOSYSTEMS

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_2_Inderi_GTRE.mxd

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3.3.3 Flora habitat values

3.3.3.1 Inderi Offset Area

One target threatened flora species, king bluegrass (*Dichanthium queenslandicum*), was identified during the May 2021 field survey. King bluegrass is a perennial grass species endemic to central and southern Queensland, occurring on heavy fertile black soils within the Fitzroy Basin and regions near the northern Darling Downs district (DSEWPaC 2013; Stanley and Ross, 1989). Within its distribution, king bluegrass inhabits native grasslands and open woodlands with a grassy understorey and a *Eucalyptus orgadophila, Corymbia erythrophloia*, *E. coolabah* tree layer (DSEWPaC 2013; Stanley and Ross 1989). The species occurs in association with other bluegrasses (*Dichanthium spp*. and *Bothriochloa spp*.) and other native grasses associated with heavy, black soil types (Simon 1982).

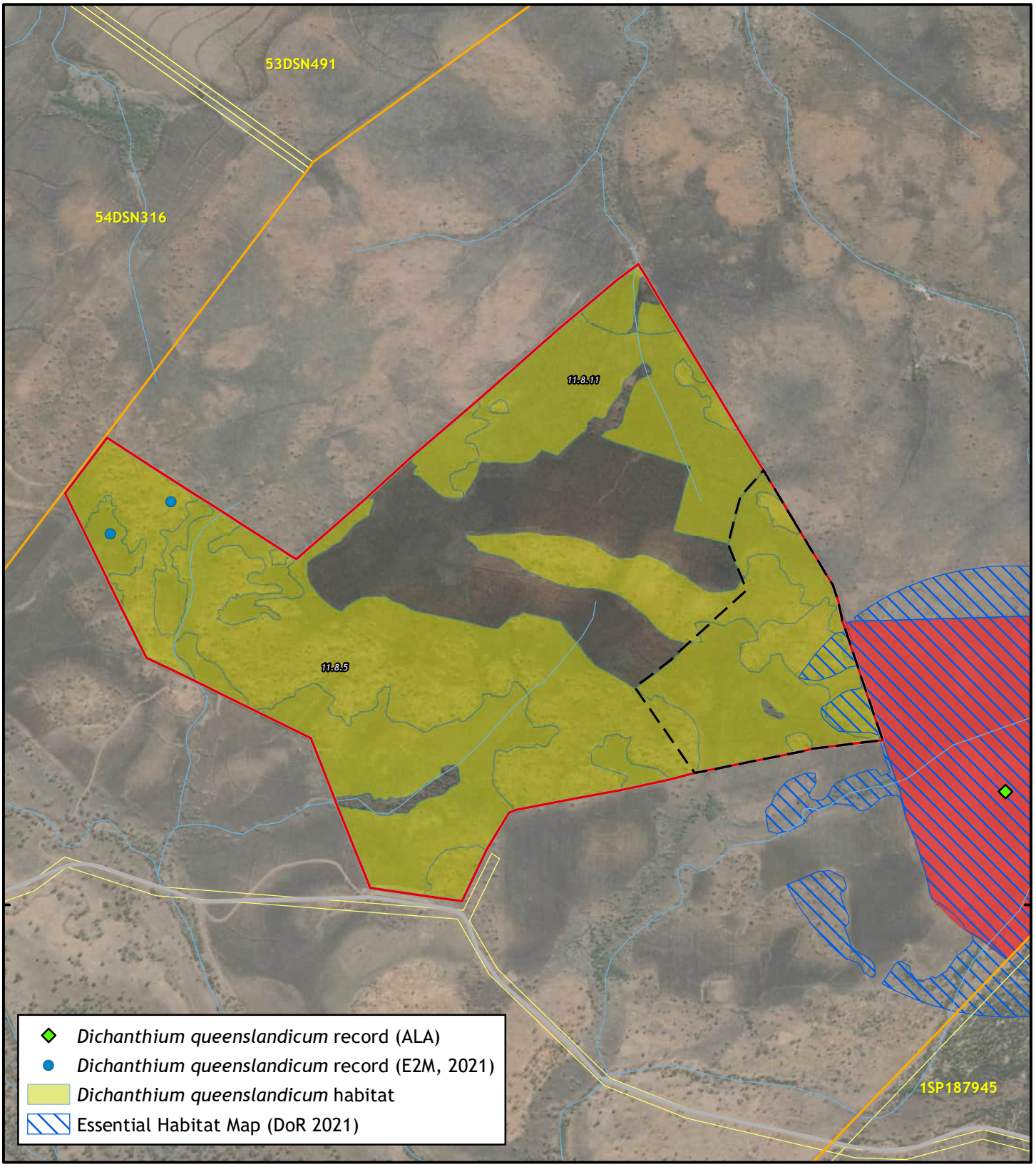
Despite the dry conditions, king bluegrass was recorded at two locations in a remnant grassland and open woodland communities (REs 11.8.11 and 11.8.5) within the Inderi Area of Interest (Photo 3 and Figure 3). A specimen was collected and submitted to the Queensland Herbarium where the identification was confirmed. The species has also been previously recorded within the adjacent BMA offset area (refer to Figure *3*).

The Inderi Offset Area is located between the confirmed records of king bluegrass (i.e. the record within the existing BMA offset area (700 m to the south-east) and the E2M field record to the north-west (approximately 2.6 km)). While the species was not detected within the Inderi Offset Area, the proximity to confirmed records of the species, coupled with active management, suitable habitat is considered likely to support populations of the species over the duration of the offset.

In total, the Inderi Area of Interest supports approximately 356 ha of *Dichanthium queenslandicum* habitat in association with remnant and non-remnant REs 11.8.11 and 11.8.5. However, only 33 ha is notionally required to acquit Project impacts. The Inderi Offset Area is 66.95 ha.

The Inderi Offset Area also contains areas of DoR-mapped essential habitat for king bluegrass (*Dichanthium queenslandicum*), associated with DoR mapped Remnant vegetation containing RE 11.8.5. These areas are associated with the record detected within the existing BMA offset area established in 2014 (Figure *3*).

Photo 3. *Dichanthium queenslandicum* recorded within the broader study area during field survey (left) and seed head (right)



Legend

- Road
- Watercourse
- Cadastre
- Offset Property
- Inderi Offset Area
- E2M Study Area
- Existing BMA Offset Category A Area (2014)

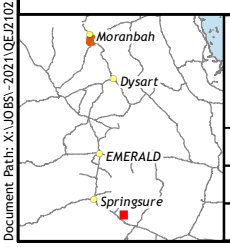
N

Scale 1:24,000 (A4)

0 1

Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
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Ordered Drainage: © DNRME 2020
Road: © DNRME 2020

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	06/03/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 3: INDERI *DICHANTHIUM QUEENSLANDICUM* HABITAT

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_3_Inderi_DQ\dicum.mxd

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3.3.4 Fauna habitat values

No threatened fauna species were recorded during the field surveys within the Inderi Area of Interest or Offset Area. Suitable habitat for target threatened fauna species relevant to the HPE Project (i.e. ornamental snake) was not observed within the Inderi Area of Interest.

3.3.5 Ecological function

3.3.5.1 Waterways and wetland features

No watercourses are mapped within the Inderi Offset Area.

The Inderi Area of Interest contains DoR mapped stream order (SO) 1 and 2 watercourses. All watercourses and drainage lines within the Area of Interest were ephemeral and dry at the time of the field surveys. Riparian corridors varied in composition and structure with some areas fringed by regrowth/degraded black tea tree (*Melaleuca bracteata*) with introduced and native grass. The watercourses were characterised by narrow, meandering channels with black, loam beds.

No wetland management areas or MSES wetlands are mapped within the Inderi Area of Interest or Offset Area.

3.3.5.2 Connectivity Areas

The Inderi Area of Interest and Offset Area, situated within the Basalt Downs subregion of the Brigalow Belt Bioregion, contains 156.77 ha of non-remnant/regrowth vegetation able to support connectivity area offsets, including 150 ha of non-remnant RE 11.8.11 (native grassland).

3.4 Additional ecological values within the Offset Area

3.4.1 MNES

3.4.1.1 Threatened Ecological Communities

No Natural Grasslands TEC is located within the Inderi Offset Area. While areas associated with remnant and non-remnant RE 11.8.11 did not qualify for the Natural Grasslands TEC, these areas have potential to qualify in the future pending grassland restoration and/or management efforts to reduce weed encroachment and promote native tussock cover. The prevalence of weed species (mostly parthenium and buffel grass) and the scarcity of grass tussocks precluded this community from qualifying as a 'best' or 'good' condition grassland.

3.4.1.2 Threatened species

One additional threatened species, namely *Dichanthium setosum,* listed as Vulnerable under the EPBC Act is also considered likely to occur within the Inderi Offset Area.

Dichanthium setosum is a perennial grass up to 70 cm tall, with unbranched culms and bearded nodes (Stanley and Ross 1989b). Leaf sheaths are glabrous and linear, reaching up to 18 cm in length and 0.15 to 0.4 cm wide (Stanley and Ross 1989b). Spikelets are arranged on one to two racemes, rarely three, 3.5 to 8 cm long (Stanley and Ross 1989b). The sessile spikelet is 5 to 6 mm long with long hairs on the lower of the glume. Pedicellate spikelets are 5 to 5.5 mm long (Stanley and Ross 1989b). Lemma and awn on upper florets are approximately 2.5 cm long (Stanley and Ross 1989b).

The species occurs in natural grasslands and eucalypt woodlands on heavy, basalt-derived, black soils and red-brown, hard-setting, loam with clay subsoils (Stanley and Ross 1989b). The species is relatively tolerant to disturbance and has been recorded within disturbed areas such as cleared woodlands, grassy roadside remnants, grazed land and pastures (Stanley and Ross 1989b).

The species has been recorded on the Meteor Downs Station, located 10 km west of the Inderi Property within *Eucalyptus orgadophila, Eucalyptus melanophloia* and *Corymbia erythrophloia* open woodlands (RE 11.8.5) (Atlas of Living Australia 2021; BRI AQ0971077; BRI AQ0971078; BRI AQ0732237).

Approximately 67 ha of suitable *D. setosum* habitat is present within the Inderi Offset Area, in association with vegetation communities containing RE 11.8.11 and RE 11.8.5.

3.4.2 MSES

3.4.2.1 Protected wildlife habitat

The DoR-mapped essential habitat for the ornamental snake was inspected during the field surveys and found to lack the attributes required to support the species. The closest record for the species is approximately 20 km southeast of the Inderi Offset Area, near the township of Rolleston (DES 2018).

Three additional threatened flora species listed under the NC Act are also considered likely to occur within the Inderi Offset Area. Specifically, these species include:

- *Cyperus clarus* (Vulnerable);
- *Digitaria porrecta* (Near Threatened); and
- *Trioncinia retroflexa* (Vulnerable).

3.4.2.1.1 Cyperus clarus

Cyperus clarus, listed as Vulnerable under the NC Act, is a slender tufted perennial up to 90 cm tall, which is found near Emerald in central Queensland to Delungra on the New South Wales north-west slopes (Wilson 1991). *Cyperus clarus* stems are erect and rigid, smooth to scabrous at the tip and 1-2.5 mm thick (Wilson 1991). The leaves are flat or folded (2-6 mm wide) and shorter than the flowering stem (DES 2019b). The flower head has 3 to 6 branches to 10 cm long, with each branch consisting of dense clusters of 8 to 20 short spikelets (Wilson 1991). The spikelets are flattened (7 to 18 mm long and 3 to 4.5 mm wide), with glumes golden brown to brown, 3 to 4 nerved, 2.5 to 4 mm long with the sides having and an excurved tip (Wilson 1991). The egg-shaped nuts are dusky brown to black in colour, 1.6 to 1.9 mm long and 0.6 to 0.8 mm in diameter (Cunningham et al. 1981).

Within its distribution, *Cyperus clarus* occurs on black soil (basalt derived) within grasslands or open woodland (Wilson 1991). The species is associated with grasslands on deep alluvial black clay where *Aristida leptopoda* and *Panicum queenslandicum* occur; and in *Eucalyptus melanophloia* woodland with mid-dense ground stratum of *Chrysopogon fallax* (DES 2019b). The species has been previously recorded within 20 km of the Inderi Offset Area in association with Albinia National Park. Suitable habitat within the Inderi Offset Area include non-remnant grasslands (RE 11.8.11) and remnant open eucalypt woodlands (RE 11.8.5).

3.4.2.1.2 Digitaria porrecta

Digitaria porrecta, listed as Near Threatened under the NC Act, is a loosely tufted, erect, or ascending grass up to 60 cm tall. The species has been recorded from Nebo, south-west of Mackay, the Central Highlands between Springsure and Rolleston and from Jandowae south to Warwick (DES 2019b).

The culms of the species are branched and the nodes are pubescent (Webster 1987). The leaf sheaths are typically glabrous, or have a few hairs towards the base, with membranous ligules 2 to 3 mm long. The leaf blades are linear (5-15 cm long and 0.3-0.4 cm wide), pubescent or glabrous with an attenuate apex (Webster 1987). Inflorescence are on panicles with several racemes up to 25 cm long, with lower racemes whorled and branched (3 to 10 cm long) with upper racemes solitary (Webster 1987). The spikelets are arranged in pairs, 5 to 7 mm long, with the lower glume 1-1.5 mm long and upper glume shorter than spikelet (Stanley and Ross 1989c).

Within its distribution, *Digitaria porrecta* occurs in native tussock grasslands, open woodlands containing poplar box (*Eucalyptus populnea*) or forest red gum (*E. tereticornis*) on heavy, cracking clays (DES 2019b). The species has been previously recorded within proximity (10 km) of the Inderi Offset Area, at the Rolleston Coal Mine (Atlas of Living Australia 2021). Suitable habitat within the Inderi Offset Area include non-remnant grasslands (RE 11.8.11) and remnant open eucalypt woodlands (RE 11.8.5).

3.4.2.1.3 Trioncinia retroflexa

Trioncinia retroflexa, listed as Endangered under the NC Act, is considered likely to occur within the Inderi Area of Interest. The species is an erect, perennial herb, to 50 cm tall, endemic to Clermont and Springsure in central Queensland, occurring on basaltic plains (Queensland Herbarium 2017). Leaves are usually basal alternate, deeply divided (once or twice), trowel-shaped and up to 3.7 cm long by 2.5 cm wide. The flower heads are up to 7mm in diameter and radiate on stems from the centre of the plant (Veldkamp 1992). The ring of involucral bracts surrounding the flower head are straight with at least five irregular florets around the outer edge of the flower head. The ray florets are 2-lobed and approximately 3.25 mm long (Veldkamp 1992). There are 10 or more disc florets in the centre of the flower head, each with 4 short, yellow petals (Veldkamp 1992). The fruit are 8-11 mm long, dark-brown to black in colour, slightly curved inward, ribbed and with a number of warty ridges (Veldkamp 1992). There are three, sometimes four, strongly reflexed awns at the apex (Veldkamp 1992).

Within its distribution, *Trioncinia retroflexa* habitat includes grasslands on basalt soils and dark brown or black cracking clay soils (Veldkamp 1992). Several records of the species have been previously documented in grasslands within 16 km of the Inderi Offset Area . Suitable habitat within the Inderi Offset Area include non-remnant grasslands (RE 11.8.11).

4 Croydon Station Offset Area Description

4.1 Property details

Croydon Station (Lot 4 on Plan KL210) is a large 58,669 ha cattle station located 100 km north of Marlborough and approximately 100 km east southeast of the HPE Project (i.e. the impact site). Croydon Station occurs in both the Isaac-Comet Downs and Nebo-Connors Ranges biogeographic subregions and is bordered by the Connors Ranges to the east.

The vegetation within the property is predominately shrubby brigalow (*Acacia harpophylla*) (RE 11.4.9) with mixed eucalypt woodland (RE 11.3.2/11.3.4/11.3.7) on alluvial plains along numerous drainage systems including Lotus Creek and Connors River.

Brigalow was first cleared on the Station in the early 1970s and have been periodically re-cleared to manage regrowth (DoR, 2022). Pasture improvement with species such as buffel grass (*Cenchrus ciliaris*) has also been undertaken to support cattle grazing.

BHP Mitsui Coal Pty Ltd (BMC) currently own and manage an existing 360.54 ha Offset Area (Category A) secured within Croydon Station immediately adjacent to the northern extent of the Area of Interest (Figure 4).

The Croydon Station Area of Interest was surveyed for it's suitability to offset Project impacts to ornamental snake habitat, squatter pigeon habitat and connectivity area.

Table 8. Property and Offset Area details

Property name	Croydon Station
Lot on Plan	Lot 4 on Plan KL210
Tenure	Leasehold
Primary LGA	Isaac Regional Council
Planning Scheme Zone	Rural
Property area	58,669 ha
Offset area	The Croydon Offset Area is 502.48 ha and can acquit the required 259 ha offset for ornamental snake and 228 ha for squatter pigeon (southern).
Legally binding mechanism	Voluntary Declaration (*Vegetation Management Act 1999*)

4.1.1 Croydon Offset Area

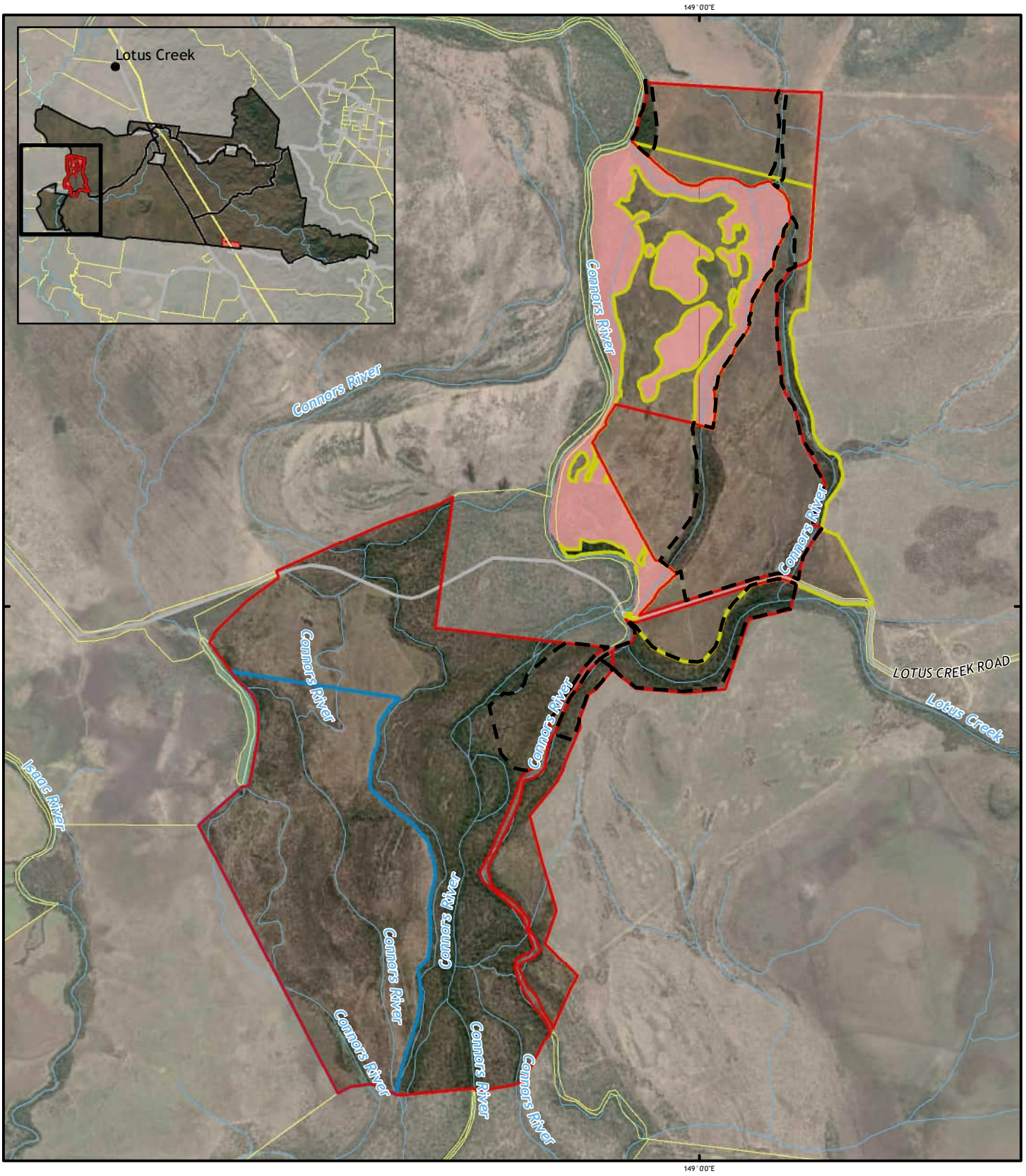
The Croydon Offset Area is a subset of the broader Area of Interest delineated to capture the requisite amount of ornamental snake habitat and squatter pigeon habitat necessary to fulfil the notional offset areas (259 ha and 228 ha, respectively).

The 512.26 ha Offset Area consists of remnant eucalypt woodland and regrowth brigalow. Much of the area demarcated as an offset for squatter pigeon habitat consists of riparian habitat along Lotus Creek located south of Lotus Creek Road whereas all of the ornamental snake habitat is located within regrowth

shrubby brigalow north of Lotus Creek Road. As the two target matters have different habitat types, the requisite offset areas cannot be collocated.

The Croydon Offset Area is partially located adjacent to the existing BMC offset area (Figure 4).

Securing the Croydon Offset Area will facilitate connectivity between the two offset areas and enhance the conservation benefit for the species and vegetation communities the offsets are currently managed for (i.e. ornamental snake, squatter pigeon, yakka skink, Brigalow Threatened Ecological Community as well as other 'least concern' species inhabiting the area).



Legend

- Watercourse
- Cadastre
- Croydon Offset Area (512.25ha)
- E2M Study Area (May 2021)
- E2M Study Area (April 2022)
- Area of Interest (BHP supplied shapefile)
- Existing BMC Offset Category A Area (2017)

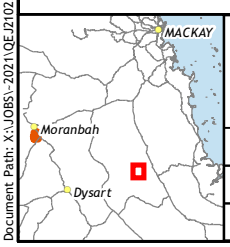
N

Scale 1:60,000 (A4)

0 1 2 3

Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
Cadastre: © DNRME 2021
Watercourse: © DNRME 2020
Road: © DNRME 2020
Area of Interest supplied 23/11/2022

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	28/02/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 4: CROYDON STATION STUDY AREAS AND OFFSET AREA

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_4_Croydon_Property.mxd

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4.2 Desktop results

The desktop assessment identified the following environmental matters potentially occurring within or in proximity (20 km) of the Croydon Area of Interest:

- MNES identified under the EPBC Act, including:
  - Four TECs, including:
    - Brigalow TEC;
    - Natural Grassland TEC;
    - Poplar box grassy woodlands on alluvial plains; and
    - Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions
  - 28 threatened flora and fauna species, including the targeted king bluegrass (*Dichanthium queenslandicum*), squatter pigeon (southern) (*Geophaps scripta scripta*) and ornamental snake (*Denisonia maculata*); and
  - Listed migratory species.
- MSES identified under the EO Act; including:
  - Regulated Vegetation, comprising:
    - Endangered and Of Concern prescribed REs (BVG 25a, 17a and 16c);
    - prescribed REs intersecting a watercourse; and
  - Protected wildlife habitat comprising essential habitat for ornamental snake (*Denisonia maculata*), koala (*Phascolarctos cinereus*) and king bluegrass (*Dichanthium queenslandicum*).

4.3 Existing environment

4.3.1 Survey conditions

The Croydon Area of Interest was surveyed by two ecologists during two separate field trips:

- 12th to 15th May 2021; and
- 6th to 10th April 2022.

Survey conditions during the May 2021 field survey were dry, with temperatures ranging from 11˚C to 31˚C. Recent rainfall data is limited for the area. Carfax weather station (034016) (approx. 35 km west of Area of Interest) recorded 24 mm of rainfall in February 2021 and 49 mm in March 2021 (no data for April 2021). Iffley weather station (34100) (approx. 60 km west of Area of Interest) recorded 41 mm of rainfall in February 2021 and 25 mm in April 2021 (no data for March 2021). Based on available data and anecdotal evidence, Croydon Station has likely received limited rainfall (~100 mm) over the three months preceding the field survey. Conditions during the field survey were dry and ground cover was limited.

Survey conditions during the April 2022 field survey were also dry, with temperatures ranging from 19˚C to 32˚C. Iffley weather station (approx. 60 km west of Area of Interest) recorded 88 mm of rainfall in three month period preceding the field survey.

4.3.2 Vegetation communities

The majority of the Croydon Offset Area was found to contain regrowth brigalow (*Acacia harpophylla*) as the ecologically dominant layer, consistent with RE 11.4.9 in the north and RE 11.3.1 in the southern extent. Other associated shrub species observed included Queensland ebony (*Lysiphyllum carronii*), yellowwood (*Terminalia oblongata*), *Capparis* spp. and scrub boonaree (*Alectryon diversifolius*) (Photo 4). Ground layer cover was limited and composed of mixed native and introduced grasses and forbs, including and buffel grass (*Cenchrus ciliaris**), fairy grass (*Sporobolus caroli)*, parthenium (*Parthenium hysterophorus**), sabi grass (*Urochloa mosambicensis**), harissia cactus (*Harrisia martinii**) and *Bothriochloa* spp.

Remnant riparian corridors, comprising RE 11.3.25, were characterised by Queensland blue gum (*Eucalyptus tereticornis)* and river red gum (*E. camaldulensis)* dominated woodlands to 21 m tall. Associated subcanopy species included *Acacia salicina*, *Lysiphyllum hookeri*, *Melaleuca* spp., sandpaper fig (*Ficus coronata*) and Moreton Bay ash (*Corymbia tessellaris*). The ground layer was heavily disturbed from cattle, particularly around areas containing water, dominated by exotic species including Parthenium (*Parthenium hysterophorus**), snakeweed (*Stachytarpheta jamaicensis**) and harissia cactus (*Harrisia martinii**).

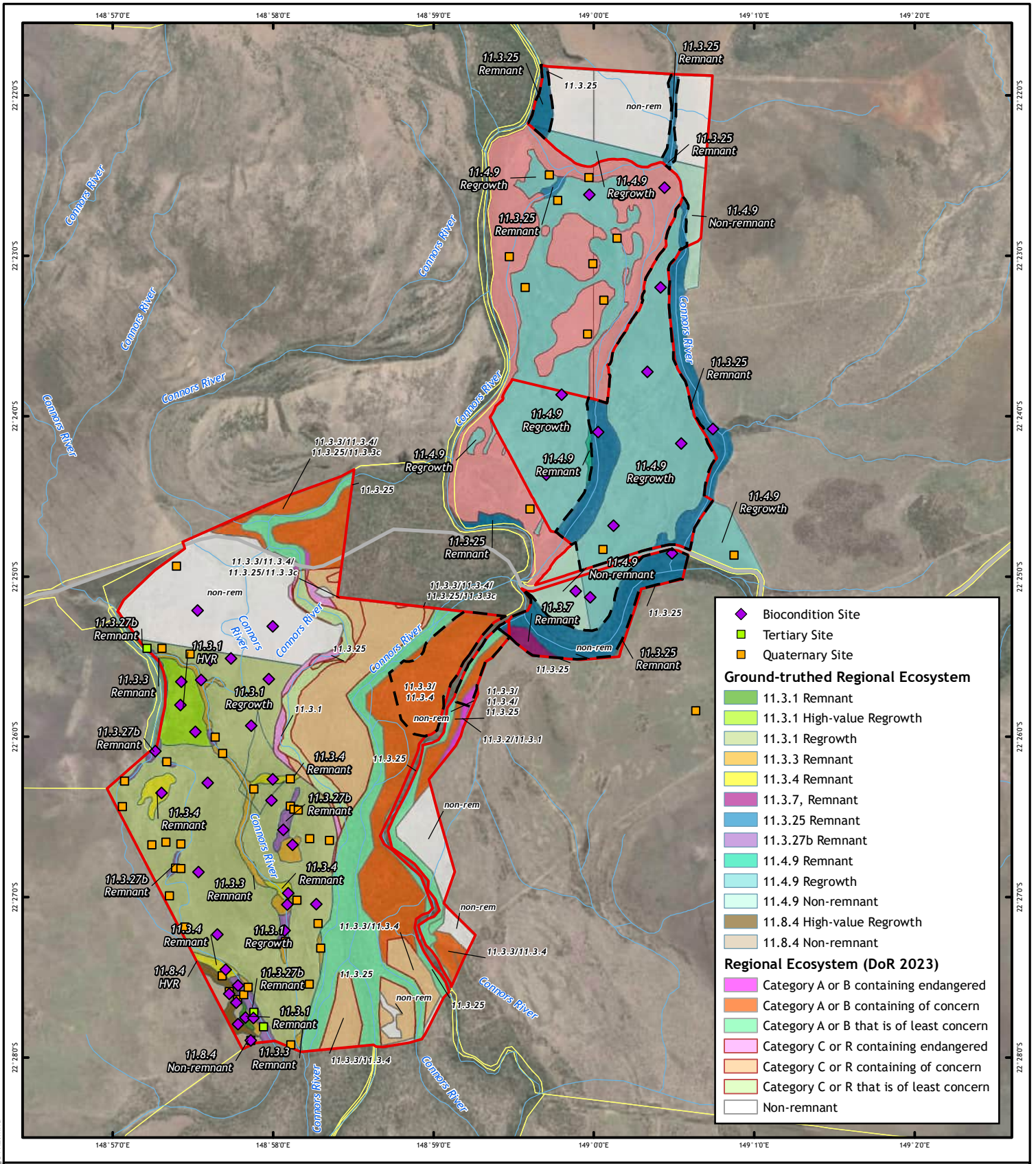
Photo 4. Typical regrowth brigalow (RE 11.4.9) present throughout the Croydon Station Area of Interest and northern parts of the Croydon Offset Area

Table 9. Vegetation communities within the Croydon Offset Area

RE	BVG	VM Act class[1]	Field description	Vegetation type	Total area (ha) within Croydon Offset Area
11.3.1	25a	E	• *Acacia harpophylla* dominated woodlands and shrublands with *Lysiphyllum carronii, Terminalia oblongata, Capparis spp. Alectryon diversifolius, Atriplex muelleri* and *Sclerolaena birchii (*Photo 4*).* • gilgai present, but varying levels of soil cracks across these areas. • Low to moderate density parthenium*, *Harrisia martinii**, *Urochloa mosambicensis* Parkinsonia aculeata** and *Cenchrus ciliaris**.	Remnant	0.11
11.3.2	17a	OC	• *Eucalyptus populnea* woodland on alluvial plains	Remnant	2.03
11.3.3	16c	OC	• *E. coolabah* dominated woodlands with associated *A. harpophylla* and *E. tereticornis*. • Native ground layer species include *Eleocharis* spp., *Cyperus* spp., *Paspalidium* spp., *Juncus* sp. and *Leptochloa digitata* • Low to moderate density *Harrisia martinii**, *Xanthium spinosa* Parkinsonia aculeata** and *Cenchrus ciliaris**.	Remnant	41.38
11.3.4	16c	OC	• Mixed eucalypt woodlands comprising *E. tereticornis, Corymbia tessellaris, C. dallachiana, E. coolabah* and *Acacia salicina.* • Native ground layer species include *Eragrostis* spp., *Chrysopogon fallax*, *Panicum* sp., *Bothriochloa* sp. and *Dichanthium sericeum* • Low density *Harrisia martinii**, *Cenchrus ciliaris* Parkinsonia aculeata**, *Vachellia farnesiana** and *Stylosanthes scabra**.	Remnant	38.83
11.3.7	9e	LC	• Mixed eucalypt woodlands comprising *Corymbia tessellaris, C. dallachiana* and *Acacia salicina.* • Native ground layer species include *Eragrostis* spp., *Chrysopogon fallax* and *Dichanthium sericeum*	Remnant	9.42

RE	BVG	VM Act class[1]	Field description	Vegetation type	Total area (ha) within Croydon Offset Area
			• Low density *Harrisia martinii**, *Cenchrus ciliaris*, Vachellia farnesiana** and *Stylosanthes scabra**.		
11.3.25	16a	LC	• thin *E. tereticornis*/*E. camaldulensis* with fringing creek lines, 21 m tall canopy). • accompanying canopy species include *Acacia salicina*, *Lysiphyllum hookeri*, *Melaleuca spp.*, sandpaper fig (*Ficus coronata*) and *Corymbia tessellaris*. • highly disturbed understorey in some areas, impacted by cattle. Other areas included juvenile canopy species as well as sedges such as *Gahnia aspera*. • weeds included low densities of mimosa bush (*Vachellia farnesiana*).	Remnant	156.65
11.4.9	25a	E	• A thin band of remnant brigalow (*Acacia harpophylla*) (15 m tall) with a highly disturbed understory located adjacent to a riparian area/creek line. • *Acacia harpophylla* shrubland (2-4 m) with minor areas containing emergent *Eucalyptus cambageana* (4-6 m) with gilgai. • gilgai present. • Low density parthenium*, *Harrisia martinii**, *Urochloa mosambicensis** and *Cenchrus ciliaris**.	Regrowth	263.69

[1] Vegetation Management Act class: E – Endangered; OC – Of Concern; and LC – least concern
[2] Biodiversity Status: E – Endangered; OC – Of Concern; and NC – No Concern at Present



Legend

- Road
- Watercourse
- Cadastre
- Croydon Offset Area
- Area of Interest (BHP supplied shapefile)
- Existing BMC Offset Category A Area (2017)

N

Scale 1:60,000 (A4)

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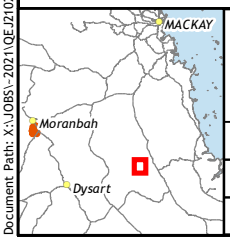
Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
Cadastre: © DNRME 2021
Ordered Drainage: © DNRME 2020
Road: © DNRME 2020
Area of Interest supplied 23/11/2022

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	28/02/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 5: CROYDON GROUND-TRUTHED REGIONAL ECOSYSTEMS

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_5_Croydon_GTRE.mxd

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4.3.3 Target flora species

No target threatened flora species were recorded during the field surveys within the Croydon Offset Area.

4.3.4 Target fauna species

Suitable habitat for two target protected matters, ornamental snake and squatter pigeon (southern), was recorded during field surveys within the Croydon Station Area of Interest.

4.3.4.1 Ornamental Snake

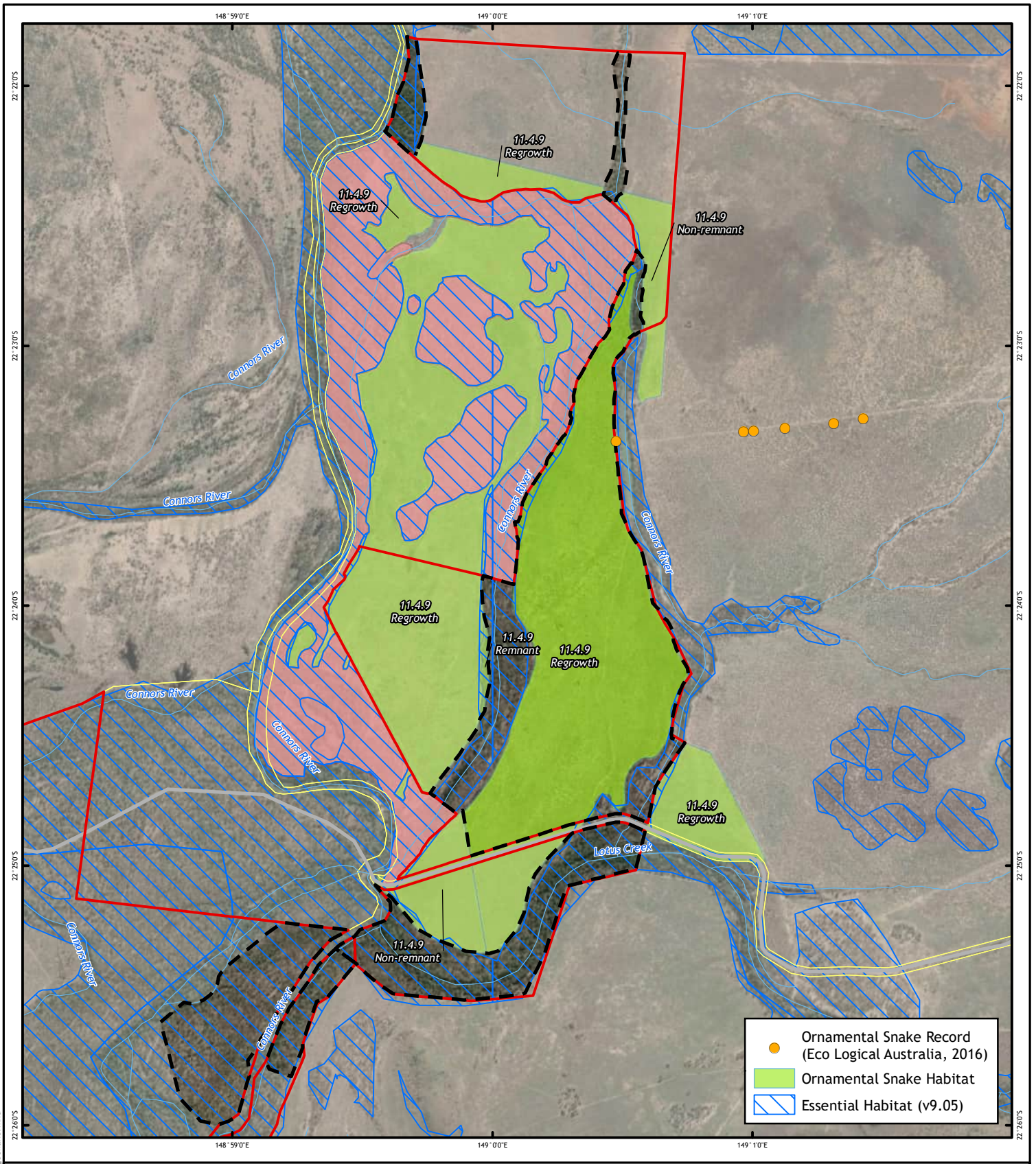
Approximately 723.5 ha of suitable ornamental snake habitat was ground-truthed within the Croydon Area of Interest; however only 259 ha are notionally required to fully acquit the requisite offset.

Gilgai were observed throughout remnant, regrowth and non-remnant RE 11.4.8/11.4.9 and differed in size and depth, with varying soil crack depths (shallow to deep) (Photo 5). Coarse woody debris is limited within these areas; but the shrub cover (~19%) is relatively low to the ground (1.5 m tall) and likely to provide adequate refuge for the species.

The May 2021 and April 2022 field surveys were conducted outside of the recommended ornamental snake survey window (i.e. summer/wet season) and while daytime temperatures were warm (~30°C), night time temperatures dropped to ~11°C (BOM 2021). The cooler temperatures and dry conditions likely affected the availability of prey (i.e. frogs) and reduced nocturnal activity (and likelihood of detection) of the species.

Approximately 263.68 ha of ornamental snake habitat was demarcated from the total available habitat identified within the broader area (i.e. approximately 723.5 ha of ornamental snake is available). While the species was not observed during the 2021/2022 field surveys, ornamental snake was recorded in 2016 by Eco Logical Australia during ecological studies associated with the adjacent BMC offset. These records were located within in brigalow regrowth habitat, located on the eastern boundary of the Offset Area and areas to the east of Connors River (Figure *6*).

Photo 5. Gilgai within brigalow regrowth supports suitable ornamental snake habitat



Legend

- Road
- Watercourse
- Cadastre
- Croydon Offset Area
- Area of Interest (BHP supplied shapefile)
- Existing BMC Offset Category A Area (2017)

N

Scale 1:37,000 (A4)

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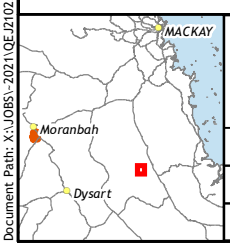
Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
Cadastre: © DNRME 2021
Ordered Drainage: © DNRME 2020
Road: © DNRME 2020

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	01/03/2023
5	Issued for Use	DL	PW	17/08/2022

FIGURE 6: CROYDON ORNAMENTAL SNAKE HABITAT

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_6_Croydon_OSnake.mxd

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4.3.4.1.1 Squatter pigeon

A total of 246.50 ha of squatter pigeon (southern) habitat has been allocated within the Offset Area to satisfy the notionally required offset area (i.e. 228 ha) (Table 10).

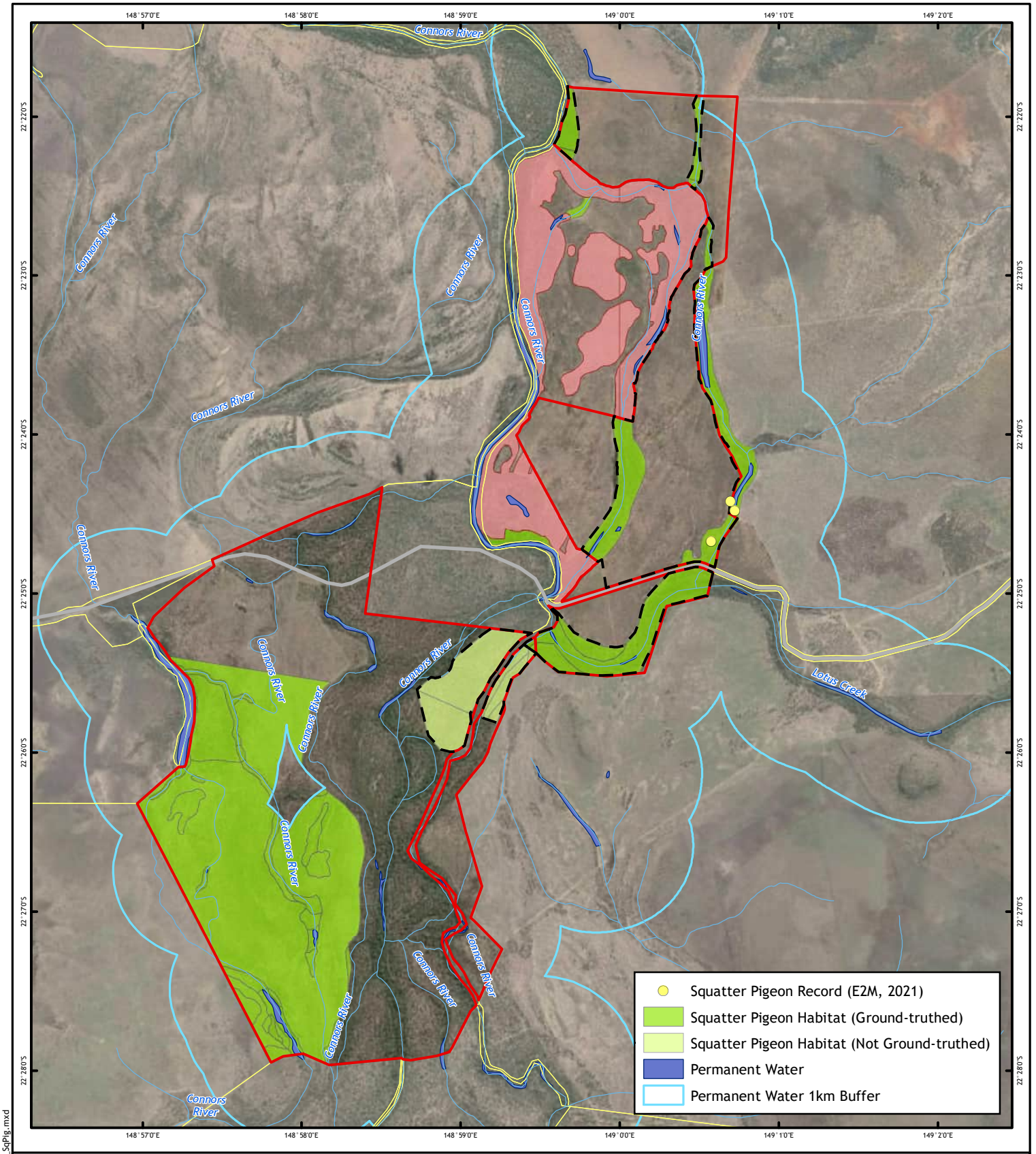
Seven squatter pigeon were recorded at three locations within the broader study area during the May 2021 field surveys (Figure 7). The observations were made approximately 2.2 km from the Offset Area in association with remnant riparian vegetation fringing the eastern anabranch of Connors River.

Photo 6. Squatter pigeon observed within the Croydon Study Area during May 2021 field surveys

Preferred habitat was recorded in association with remnant and non-remnant riparian vegetation along Lotus Creek, anabranches of Connors River that traverse the broader study area and associated floodplain. The Lotus Creek and Connors River anabranches are considered permanent water sources. Suitable habitat was also mapped in association with areas of remnant and regrowth vegetation. Squatter pigeon habitat was mapped in accordance with the criteria detailed within the draft Central Queensland Threatened Species Habitat Descriptions (Kerswell et al., 2020), consistent with the method adopted for the Project.

Table 10. Squatter pigeon habitat within the Offset Area

GTRE	Vegetation Type	Offset area (ha)
11.3.25	Remnant	156.62
11.3.3	Remnant	41.55
11.3.4	Remnant	38.91
11.3.7	Remnant	9.42
	TOTAL squatter pigeon habitat within the Offset Area	246.50



Legend

- Road
- Watercourse
- Cadastre
- Croydon Offset Area
- Area of Interest (BHP supplied shapefile)
- Existing BMC Offset Category A Area (2017)

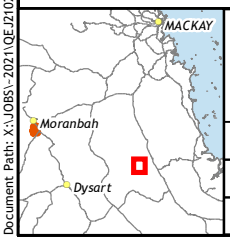
N

Scale 1:60,000 (A4)

0 1 2 3

Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
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Ordered Drainage: © DNRME 2020
Road: © DNRME 2020
Area of Interest supplied 23/11/2022

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	01/03/2023
5	Issued for Use	DL	PW	13/12/2023

FIGURE 7: CROYDON SQUATTER PIGEON HABITAT

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_7_Croydon_SqPig.mxd

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4.3.5 Ecological function

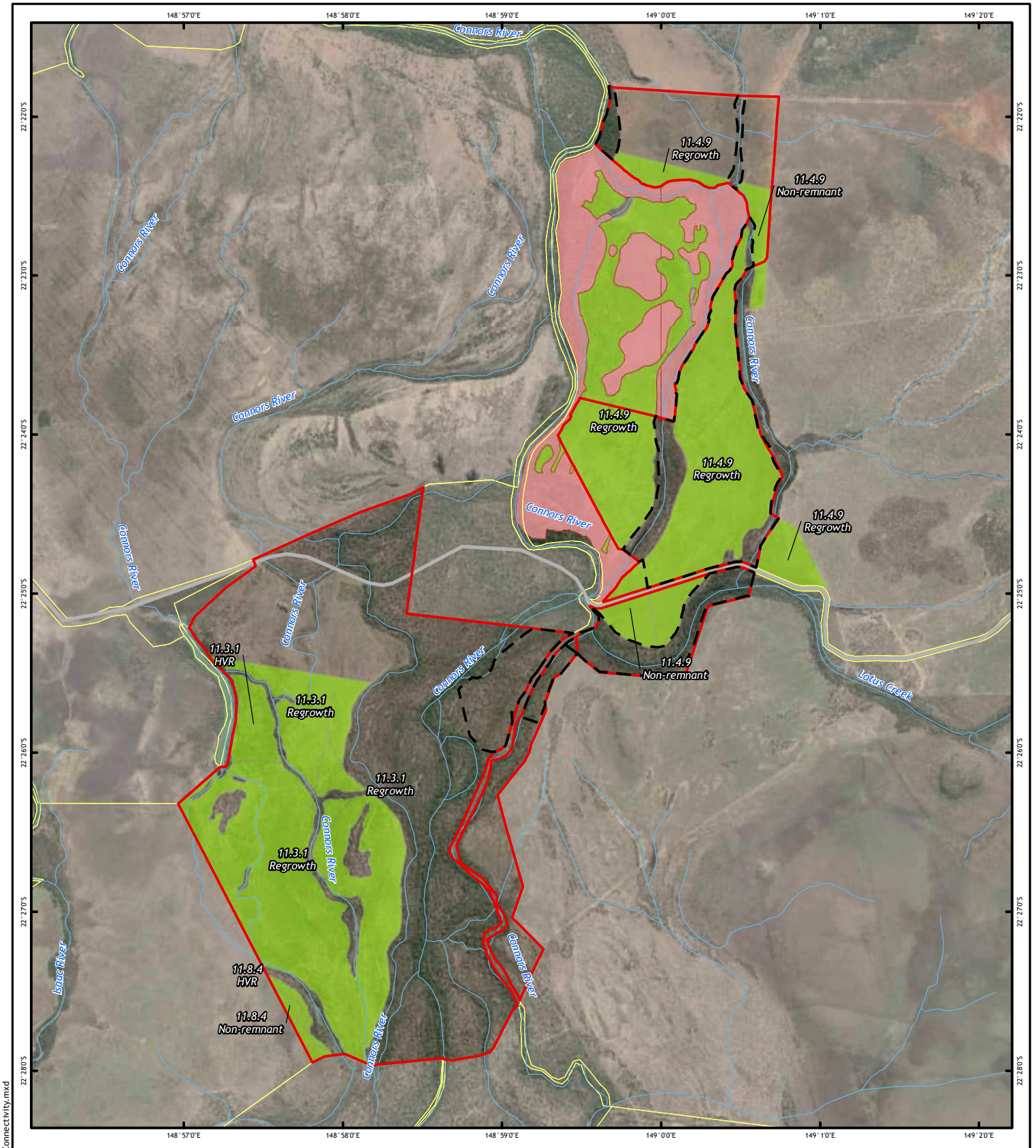
4.3.5.1 Waterways and wetland features

A number of watercourses are located within the Croydon Offset Area, including Lotus Creek and anabranches of Connors River. Higher stream order watercourses within the Offset Area were characterised by wide, sandy channels with defined bed and banks. At the time of the field surveys the upper branches of Connors River and ephemeral drainages were largely dry or containing scattered pools, with Lotus Creek containing flowing water.

No wetland vegetation management areas or MSES wetlands are mapped within the Croydon Area of Interest or Offset Area.

4.3.5.2 Connectivity

Croydon Station, located within the Isaac-Comet Downs subregion of the Brigalow Belt Bioregion, contains 1,329 ha of regrowth vegetation that may provide potential Connectivity Area offsets, including 263.68 ha within the Croydon Offset Area (Figure 8).



Legend

- Road
- Watercourse
- Cadastre
- Croydon Offset Area
- Area of Interest (BHP supplied shapefile)
- Existing BMC Offset Category A Area (2017)
- Suitable Offset Area for MSES Connectivity

N

Scale 1:60,000 (A4)

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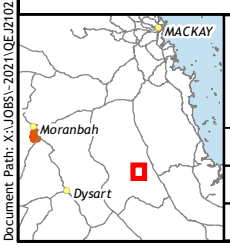
Kilometres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2021
Cadastre: © DNRME 2021
Ordered Drainage: © DNRME 2020
Road: © DNRME 2020
Area of Interest supplied 23/11/2022

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	LW	01/03/2023
5	Issued for Use	DL	PW	13/12/2022

FIGURE 8: SUITABLE OFFSETS FOR MSES CONNECTIVITY AREAS WITHIN THE CROYDON STUDY AREA AND OFFSET AREA

Horse Pit Offset Assessment
BMA Caval Ridge Mine

Map Number	Job Number	Rev
1 of 1	QEJ21025	6

Document Path: X:\JOBS\-2021\QEJ21025\GIS\QEJ21025_Offset_8_Croydon_Connectivity.mxd

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4.4 Additional ecological values within the Offset Area

4.4.1 MNES

4.4.1.1 Threatened Ecological Communities

No TECs listed under the EPBC Act were identified within the Croydon Offset Area during the field survey. The brigalow (*Acacia harpophylla*) regrowth communities (REs 11.4.9 and 11.3.1) observed within the Offset Area has the potential to develop into the Brigalow TEC over time, with appropriate management. While these shrubland communities are dominated by brigalow (*Acacia harpophylla*) and conform to the RE type, area requirements and weed cover thresholds, they have been comprehensively cleared in the last 15 years and are therefore, at the time of survey, excluded from the Brigalow ecological community.

4.4.2 MSES

4.4.2.1 Regulated Vegetation

Areas containing endangered remnant REs 11.3.1 and 11.4.9 and of concern REs 11.3.3 and 11.3.4 may be suitable offsets for MSES regulated vegetation. Regrowth vegetation of RE 11.4.9 and RE 11.3.1 (BVG 25a), totalling 692.26 ha, may also be utilised as a potential offset in conjunction with appropriate management measures for MSES Regulated Vegetation containing an Endangered RE.

5 Habitat Quality Analysis

Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (referred to as the Habitat Quality Guide) (DES 2020). The Habitat Quality Guide measures the overall viability of a potential offset area and its capacity to support the target protected matters.

The Habitat Quality Guide incorporates landscape scale data, site-based vegetation attributes (using the BioCondition assessment framework (Eyre et al. 2015)) and fauna species habitat attributes. The following sections summarise the attribute data for the Inderi Offset Area and Croydon Offset Area. The detailed Habitat Quality score data and associated calculations are in Appendix B.

5.1 Inderi Offset Area scores

5.1.1 Landscape-scale attribute score

Landscape-scale attributes describe the broader landscape surrounding a potential offset area and the relative influence that these areas have on the vegetation quality present. The Inderi Offset Area is located within a fragmented landscape, as identified under the BioCondition Assessment Manual (Eyre et al. 2015). A summary of landscape-scale attribute scores for the Inderi Offset Area are summarised in Table 11. The Inderi Offset Area has a total landscape-scale attribute score of 13 out of 20. The Inderi Offset Area is not located within a mapped State-wide Biodiversity Corridor.

Table 11. Inderi landscape-scale attribute scores for fragmented subregions

Landscape attribute	Comment	Score
Patch size	≥25 – 100 ha remnant OR ≥25 – 200 ha remnant and regrowth	5
Connectivity	connected with adjacent remnant vegetation along 50% to 75% of its perimeter	4
Context	69% remnant	4
Ecological Corridors	The Offset Area is not located within a State Biodiversity Corridor	NA
	Total	13

5.1.2 Site-based attribute scores

A total of 15 BioCondition surveys were conducted across two assessment units within the Inderi Area of interest for the two target protected matters (i.e. *Dichanthium queenslandicum* habitat and MSES Regulated Vegetation). The scores were then averaged based on the assessment units present within the Inderi Offset Area. The BioCondition data was analysed to generate the site-based attribute scores summarised in Table 12.

Site-based attribute scores and associated BioCondition data are provided in Appendix C.

Table 12. Inderi Offset Site site-based attribute scores for each target protected matter

Target protected matter	Assessment Unit	Broad Condition Class	RE	Area (ha)	Number of survey sites	Average site-based attribute score (/10)
MNES known to occur						
Dichanthium queenslandicum	1	non-remnant	11.8.11	39.83	8	4.81
	2	remnant	11.8.5	26.78	7	
MSES known to occur						
Regulated Vegetation Of Concern RE (BVG 30b)	1	non-remnant	11.8.11	39.83	8	3.96

5.2 Croydon Offset Area scores

5.2.1 Landscape-scale attribute score

Landscape-scale attributes describe the broader landscape surrounding Croydon Station and reflect the influence the landscape has on vegetation quality within the Croydon Offset Area. The Croydon Offset Area is located within a fragmented landscape, as identified under the BioCondition Assessment Manual (Eyre et al., 2015). A summary of landscape-scale attribute scores for the Croydon Offset Area are summarised in Table 13. The Croydon Offset Area has a total landscape-scale attribute score of 9 out of 20.

Table 13. Croydon landscape-scale attribute scores

Landscape attribute	Comment	Score (/20)
Patch size	<5 ha remnant AND/OR regrowth (DoR mapped)	0
Connectivity	Connected with adjacent remnant vegetation along >75% of its perimeter	5
Context	(≥10% to 30% remnant vegetation AND ≥30% regrowth) 28% remnant and 27% regrowth	4
Ecological Corridors	The Offset Area is located within and adjacent to State Biodiversity Corridor (Regional) in association with Lotus Creek	N/A
	Total	9

5.2.2 Site-based attribute score

The BioCondition data was analysed to generate the site-based attribute Habitat Quality scores summarised in Table 14.

Site-based Habitat Quality calculations and BioCondition data are provided in Appendix B.

Table 14. Croydon site-based attribute scores for each target protected matter

Target protected matter	Assessment Unit	Broad Condition Class	RE	Area (ha)	Number of survey sites	Average site-based attribute score (/10)
MNES likely to occur						
ornamental snake (*Denisonia maculata*)	1	regrowth	11.4.9	263.68	9	3.41
squatter pigeon (southern) (*Geophaps scripta scripta*)	3	remnant	11.3.25	156.62	5	5.66
	5	remnant	11.3.3	41.55	1	
	4	remnant	11.3.4	38.91	1	
	6	remnant	11.3.7	9.42	1	
MSES known to occur						
Connectivity area	1	regrowth and non-remnant	11.4.9	263.68	9	3.41

5.2.3 Species habitat attribute score

Species habitat attribute scores assess the suitability of habitat within the Offset Area to support fauna based on species-specific habitat requirements, not just vegetation-based metrics used for site-based attribute scores.

The 'indicators' (habitat characteristics of species-specific lifecycle requirements) within the Croydon Offset Area that influence the suitability of ornamental snake and squatter pigeon habitat are detailed in Table 15 and Table 16 respectively.

Table 15. Ornamental snake habitat attribute score

Habitat attributes	Indicators	Score	Weighting	Weighted score	Justification
Quality and availability of food and habitat required for foraging (25%)	Abundance of native amphibians (low (0) to high (5)) x5	12.5	1.00	12.5	At the time of survey (late May 2021) the availability of food (i.e. frogs) within the Offset Area was low correlating with the reduced activity period for ornamental snakes. The potential quality and availability of foraging habitat within the Offset Area is high based on the abundance of gilgai, observed soil cracks and proximity to permanent water. This weighted score (12.5) based on dry season data is likely lower than the actual quality and availability of food/foraging habitat.
	Sub-total			12.5	
Quality and availability of habitat required for shelter and breeding (25%)	Gilgai abundance (absent (0) to high (5)) x 5	20	0.25	5	Gilgai are abundant throughout RE 11.4.9 within the Offset Area
	Gilgai depth (shallow (1) to deep (5)) x 5	10	0.25	2.5	Gilgai within RE 11.4.9 are relatively shallow
	Soil crack abundance (absent (0) to abundant (5)) x 5	15	0.20	3	Soil cracks are common within gilgai
	Soil crack depth (shallow (1) to deep (5)) x 5	10	0.20	2	Soil cracks within gilgai vary in depth from shallow to deep
	Woody debris (absent (0) to abundant (5)) x 5	5	0.10	0.5	Woody debris is scarce within RE 11.4.9

Habitat attributes	Indicators	Score	Weighting	Weighted score	Justification
	Sub-total			13	
Quality and availability of habitat required for mobility (25%)	Average patch size (<1ha (0), 1-5ha (8.3), 5-10ha (16.6), >10ha (25))	25	1	25	There are approximately 266 ha of regrowth RE 11.4.9 within the Offset Area, largely contiguous
	Sub-total			25	
Absence of threats (25%)	Cane toad abundance (high (0) to absent (5)) x 5	20	0.25	5	At the time of survey (late May 2021) cane toads were not observed within the RE 11.4.9. Cane toads were opportunistically observed (in low abundance) near permanent water. This weighted score (5), based on dry season data, is likely higher than the actual score (i.e. the threat to ornamental snake from cane toads is realistically higher)
	Habitat degradation via cattle (high (0) to absent (5)) x 5	20	0.25	5	The impact on vegetation, soil and gilgai from cattle at the time of survey appeared low
	Predation by feral species (high (0) to absent (5)) x 5	10	0.25	2.5	Feral pigs were detected regularly during survey and pose a predator risk to ornamental snake
	Invasive weeds (abundant (0) to absent (5)) x 5	20	0.25	5	Weeds and introduced pasture grass were limited within RE 11.4.9 (buffel was localised) but may reflect the dry survey conditions This weighted score (5), based on dry season data, is potentially higher than the actual score (i.e. weeds may be comparatively more abundant in the wet season)
	Sub-total			17.5	
	Total			6.8 / 10	

Table 16. Squatter pigeon (southern) habitat attribute score

Habitat attributes	Indicators	Score	Weighting	Weighted score	Justification
Quality and availability of food and habitat required for foraging (25%)	Average ground cover less than 33% (dense ground cover (>70%) (0) to less than 33% (5)) x 5	10.00	0.5	5.00	Ground cover within the southern extent of squatter pigeon habitat includes improved pasture grass such as buffel, and decreases the habitat quality
	Average distance to water (>3km (0), 1-3km (12.5), <1km (25))	25.00	0.4	10.00	Permanent water sources are within 1 km of squatter pigeon habitat within the Area of Interest
	Abundance of seeds (absent (0) to abundant (5)) x 5	15.00	0.1	1.50	Seed diversity was moderate during the field survey
	Sub-total			16.50	
Quality and availability of habitat required for shelter and breeding (25%)	Average ground cover less than 33% (dense ground cover (>70%) (0) to less than 33% (5)) x 5	10.00	0.5	5.00	Ground cover within the southern extent of squatter pigeon habitat includes improved pasture grass such as buffel, and decreases the habitat quality
	Average distance to water (>1km (0), <1km (25))	25.00	0.4	10.00	Permanent water sources are within 1 km of squatter pigeon habitat within the Area of Interest
	Well-draining soil for nesting (absent (0) to majorly (5)) x 5	5.00	0.1	0.50	Most of the squatter pigeon habitat within the Area of Interest is located on Land Zone 3 which includes a diverse range of soils but typically is poorly drained
	Sub-total			15.50	
Quality and availability of habitat required for mobility (25%)	Dispersal habitat (no barrier to movement) present connecting fragmented patches of breeding and foraging habitat (ground cover (>70%) (0) to less than 33% (5)) x 5	15.00	1	15.00	There are no barriers to movement within or between squatter pigeon habitat identified within the Area of Interest

Habitat attributes	Indicators	Score	Weighting	Weighted score	Justification
	Sub-total			15.00	
Absence of threats (25%)	Abundance of feral predators (abundant (0) to absent (5)) x5	10.00	0.2	2.00	Feral pigs were regularly recorded within the Area of Interest during the field surveys thereby reducing habitat quality for a ground nesting bird such as squatter pigeon
	Encroachment of non-native pasture grass (e.g. buffel grass) (increases ground cover) (abundant (0) to absent (5)	10.00	0.2	2.00	With a history of pasture improvement, buffel grass was abundant throughout the Area of Interest
	Habitat loss (e.g. clearing for agriculture) (total loss of habitat (0) to no clearing (5))	15.00	0.2	3.00	The Area of Interest has been subject to habitat loss from agricultural activities
	Overstocking (abundant (0) to absent (5))	20.00	0.2	4.00	Evidence of over stocking was not observed during the field surveys
	Bushfire (high risk (0) to low risk (0)) x 5	25.00	0.2	5.00	Bush fire risk is low
	Sub-total			16.00	
	Total			6.3 / 10	

6 Offset Suitability

6.1 Inderi offset calculators

A summary of the target MNES and MSES values for the HPE Project and corresponding offset values within the Inderi Offset Area is provided in Table 17.

Table 17. Summary of Inderi Offset Area suitability

Target Protected Matter	Impact Site			Inderi Offset	
	Significant Residual Impact (ha)	Offset Area required (ha)	BioCondition site-attribute score (/10)[1]	Area within Offset Area (ha)	BioCondition site-attribute score (/10)[1]
MNES					
Dichanthium queenslandicum habitat	23.40	33.00[2]	3	66.61	5
MSES					
Regulated Vegetation (of concern RE (BVG 30b)	23.40	34.00[3]	3	39.83	4

[1] Rounded to nearest whole number as per Commonwealth Offset Assessment Guide calculator format

[2] Based on the EPBC Act offset calculator (Table 18)

[3] Based on the EO Act land-based offsets multiplier calculator

6.1.1 EPBC Act Offset Assessment Guide

The EPBC Act Environmental Offsets Policy is accompanied by the Offsets Assessment Guide which is a practical tool using a balance sheet approach to compare impacts to offsets for threatened species and ecological communities.

The *Dichanthium queenslandicum* habitat data collected from the HPE Project disturbance footprint (impact site) and the Inderi Offset Area was analysed in accordance with the Offset Assessment Guide impact and offset calculator to return a summary (Table 18 and Appendix D).

Associated risk of loss without the offset have estimated based on historical land management within the offset area and surrounds and those detailed for the Central Highlands Regional Council within *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al., 2017).

Table 18. *Dichanthium queenslandicum* offset calculator inputs

Attribute	Score	Rationale
Time over which loss is averted	20 years	Maximum of 20 years
Start area	33 ha	Area of suitable ling bluegrass habitat within the Inderi Offset Area comprising non-remnant RE 11.8.11 and remnant RE 11.8.5.
Risk of loss without offset	5%	The risk of loss without offset was derived in accordance with 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act (Maseyk et al., 2017). *Dichanthium queenslandicum* (king bluegrass) and Natural Grasslands TEC were confirmed to occur within the Inderi Offset Investigation Area but are situated immediately adjacent the delineated Offset Area. However, the habitat within the Offset Area is suitable for restoration/improvement activities and there is "credible, site-specific evidence to indicate development will occur within the foreseeable future" based on past land management and contemporary/future land use. Portions of the Inderi Offset Investigation Area are classified as Category X Regulated Vegetation (non-remnant) under State Legislation (i.e. Vegetation Management Act 999), and do not require approval to cultivate under State legislation. As such, cultivation within the delineated Offset Area has occurred over a number of years. While it is uncertain whether past cultivation events indicate future cultivation, the previous impact to the community paired with the current and ongoing land use, namely cattle grazing, is anticipated to gradually deteriorate the grassland habitat via the threatening processes described in the Offset Strategy without the protection and management afforded by an offset. Under Pathway D, the ROL (without offset), in accordance with Maseyk et al. (2017), must be greater than the product of the average annual background rate of loss and the time horizon of the proposed offset. The average annual background rate of loss for the Central Highlands Regional Council LGA over the life of the offset (20 years) is 1.81%. Based on the historical land management involving cultivation and current land use of cattle grazing, which is expected to exacerbate the documented threatening processes impacting native grasslands at Inderi), the ROL (without offset) is slightly higher than the average annual background rate of loss (i.e. 1.81%). As such, the ROL

Attribute	Score	Rationale
		(without the offset) for the Inderi Offset Area is calculated to be 5%. Furthermore, it is also worth noting that non-woody communities (e.g. grasslands) are not captured within the method employed to calculate ROL (Maseyk et al., 2017). As such, the estimated ROL for the Central Highlands Regional Council may not be entirely accurate for grasslands within the Inderi Offset Area.
Risk of loss with offset	0%	The Offset Area will be legally secured and clearing activities will be restricted. The risk of losing all habitat value for *D. queenslandicum* with the offset secured is negligible.
Confidence in result	85%	The level of certainty about the strength and effectiveness of the proposed risk-mitigation measures (i.e. legally binding mechanism) is high.
Time until ecological benefit	20 years	Depending on the effective application of the methods described in the Offset Area Management Plan paired with favourable environmental conditions (e.g. sufficient rainfall), improvements in habitat quality may be realised (or quantifiable/discernible) in shorter timeframe; however, twenty years allows for adaptive management (if required) and latitude for poor weather.
Start quality (/10) (offset area)	5	The BioCondition Assessment data analysis resulted in a site-attribute score of 5/10 within *D. queenslandicum* habitat in the Inderi Offset Area.
Future quality without offset (/10)	4	Native perennial grass cover and species richness were uniformly low relative to ecosystem benchmarks throughout the grassland community within the Inderi Offset Area. The dry conditions (i.e. below average rainfall) combined with grazing has likely diminished the habitat quality and occurrence of *D. queenslandicum* within the offset Without the security and management of an offset, the future quality may remain static (status quo) or, more likely, decrease due to grazing and/or weed encroachment (particularly where parthenium and buffel grass are already localised).
Future quality with offset (/10)	7	The application of grassland restoration techniques (e.g. regrowth/restricted grazing, controlled burn, etc) with the clearing protection of a legally binding mechanism is expected to increase native grass species richness/cover and improve *D. queenslandicum* habitat quality
Confidence in result	85%	The level of certainty in the change of habitat quality through grassland restoration is quite high as the threats and mitigation measures specific to natural grasslands are well studied and defined. The methods proposed to

Attribute	Score	Rationale
		enhance the habitat quality are consistent with the approved conservation advice.
Overall calculator rating (% of impact offset)	100%	To achieve 100% offset acquittal (using the above metrics), the requisite offset area is 33 ha.
Minimum direct offset requirement met (90%)?	Yes	To achieve the minimum (90%) direct offset requirement (using the above metrics), the requisite offset area is 30 ha.

6.1.2 EPBC Act Environmental Offsets Policy Compliance

The EPBC Act Environmental Offsets Policy (EOP) requires that offsets must deliver an overall conservation gain that compensates for the significant residual impacts associated with the HPE Project. A suitable offset must meet the offset requirements of the EOP. Compliance of the Inderi Offset Area as proposed in this strategy with the EOP is demonstrated in Table 19.

Table 19. Inderi offset area compliance with EPBC Act EOP offset requirements

EPBC EOP offset requirements	Rationale
Deliver an overall conservation outcome that improves or maintains the viability of the protected matter	The Inderi Offset Area supports confirmed *D. queenslandicum* habitat. With formal protection and land management, the viability of *D. queenslandicum* will be improved by promoting the recovery of the species thereby delivering an overall conservation outcome
Be built around direct offsets but may include other compensatory measures	The full offset requirement will be delivered via a direct, land-based offset within the Inderi Offset Area
Be in proportion to the level of statutory protection that applies to the protected matter AND Be of a size and scale proportionate to the residual impacts on the protected matter	The proposed offset will provide a direct offset and measurable conservation gain. The proposed offsets have been developed using the OAG (Section 6.1.1) which uses the area of impact and the quality of habitat to assess the total quantum of impact to protected matters that needs to be offset
Effectively account for and manage the risks of the offset not succeeding	Potential risks to the success of the offsets have been identified at an overall level and are reflected in the OAG inputs (Section 6.1.1). A detailed risk assessment has been developed as part of the Offset Area Management Plan (OAMP). The OAMP also includes measures (such as regular monitoring), triggers and remedial actions to manage risk

EPBC EOP offset requirements	Rationale
Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs	The Inderi Offset Area does not have any existing formal conservation arrangement in place or existing requirements from other approvals that require the landowner or licensees to undertake conservations works. Current permitted land use across the offset area includes cattle grazing
Be efficient, effective, timely, transparent, scientifically robust and reasonable	Direct, land-based offsets have been selected as the preferred offset method for this project as it is a robust and widely accepted approach, with a high degree of confidence in outcome
Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The offset will be secured using a Voluntary Declaration under the provisions of the VM Act and supported by an OAMP. The OAMP will detail the monitoring and reporting program

6.1.3 EO Act Land-based Offsets Multiplier Calculator

In accordance with the Queensland Environmental Offsets Policy (DES, 2021) an offset must be of a size and scale proportionate to the significant residual impact on a prescribed environmental matter necessary to achieve a conservation outcome (Table 20). The offset requirement for a significant residual impact on a 'Of Concern' Regional Ecosystem is set at a maximum multiplier of 4 (i.e. a maximum of four times the residual impact). A land-based offset can achieve a conservation outcome using a multiplier of less than 4 pending approval by the administering agency. The Land-based Offsets Multiplier Calculator (DEHP), assists in refining the multiplier using scientific data as well as impact and offset site field data.

Based on the area impacted and habitat quality of the remnant grassland ('Of Concern' RE 11.8.11) within the HPE Project disturbance footprint relative to the area of grassland available and its habitat quality within the Inderi Offset Area, the Land-based Offsets Multiplier Calculator returned a multiplier of:

- 2.86 for remnant RE 11.8.11; and
- 1.45 for non-remnant RE 11.8.11.

Using the Combined Offset Delivery Calculator, 34 ha of non-remnant grassland (RE 11.8.11) will 100% directly offset the HPE's Project impact on 23.4 ha of remnant grassland (RE 11.8.11) (Appendix E).

Table 20. Justification of conservation outcome for MSES within the Inderi Offset Area

Offset Plan requirements	Rationale
Describe the prescribed environmental matter to which the offset condition relates	The Inderi Offset Area will acquit Project impacts to MSES Regulated Vegetation containing of concern RE 11.8.11 (BVG 30b).

Offset Plan requirements	Rationale
State whether the offset condition will be delivered, wholly or partly, on the land on which the environmental offset will be undertaken	The Inderi Offset Area will acquit the entirety (100%) of the required impacts to MSES Regulated Vegetation containing of concern RE 11.8.11 (BVG 30b) associated with the Project. Incorporating the revised offset multipliers (refer to DEHP land-based offset multiplier tool (2014)) for land-based offsets, 34 ha of non-remnant grassland characteristic of RE 11.8.11 will directly acquit 100% of HPE Project impacts to 23.4 ha of remnant RE 11.8.11
Include particulars of, or a description sufficient to identify, the land on which the environmental offset will be undertaken	The Inderi Offset Area comprises parts of the cadastral parcel formally referred to as Lot 55 on Plan DSN318.
Identify, and contain details of, any person with an interest in the land on which the environmental offset will be undertaken	Landowner and manager.
Describe the existing land use of the land on which the environmental offset will be undertaken and any impact that land use may have on the delivery of the offset	The Inderi property currently supports cattle grazing with selected areas previously tilled for pasture/fodder. The Offset Area within the property comprises a 67 ha area largely characterised by natural grasslands and coolabah (*Eucalyptus orgadophila*) open woodlands on gently undulating rises (Figure *2*). An existing BMA offset area (established in 2014) is secured within the Inderi property located immediately adjacent to the Offset Area (Figure 2) and is undergoing active management. The proposed Offset Area will be fenced to exclude any livestock grazing and managed in accordance with an Offset Area Management Plan.
State— (i) the measures the authority holder will take to secure the land on which the environmental offset will be undertaken as a legally secured offset area	The Inderi offset Area will be legally secured into perpetuity in accordance with the Queensland Environmental Offset Policy via: • an environmental offset protection area under section 30 of the *Environmental Offsets Act 2014*; or • an area declared as an area of high nature conservation value under section 19F of the *Vegetation Management Act 1999*, where it is secured for the purposes of an offset

Offset Plan requirements	Rationale
Why the authority holder considers the stated measures are reasonable and practicable	The securement of the offset under through either instrument identified above will protect the vegetation from future clearing activities. Risk assessment and identification of management action within the OAMP will further assist in mitigating potential risks, including force majeure, and improving condition (i.e. weed management, livestock management, revegetation etc.). As such, the effective application of these methods are considered reasonable and practicable to secure the Offset Area and associated ecological values.
The period during which the authority holder will take the measures	In accordance with Section 2.3.1.5 of the Queensland Environmental Offset Policy (DES, 2021), the Inderi Offset Area will be actively managed until: • the administering agency is satisfied the actions and obligations of the offset delivery plan have been completed in full; and • the offset has been secured for at least the same duration as the impact on the prescribed environmental matters arising from the prescribed activity.
Why the authority holder considers the stated period is reasonable for the purpose of securing the land.	Provided the effective application of the methods described in the OAMP (e.g. livestock management, revegetation and weed management) are implemented, paired with favourable environmental conditions (e.g. sufficient rainfall), improvements in habitat quality may be realised (or quantifiable/discernible) within twenty years. However, as per the Queensland Environmental Offset Policy, securement of the offset will be required as detailed above.

6.2 Croydon Station offset calculators

A summary of the target MNES values for the HPE Project impact site and corresponding offset values within the Croydon Offset Area is provided in Table 21.

Table 21. Summary of Croydon Offset Area suitability

Target Protected Matter	Project Site				Croydon Offset		
	Significant Residual Impact (ha)	Offset Area required (ha)	Site-attribute score (/10) [1]	Species-habitat attribute score (/10)	Habitat within Offset Area (ha)	Site-attribute score (/10) [1]	Species-habitat attribute score (/10)
MNES							
ornamental snake	167.84	259.00[2]	4	6	263.68	3	7
squatter pigeon (southern)	88.53	228.00[2]	5	5	248.64	6	6
MSES							
Connectivity area	84.19	84.19[3]	NA	NA	263.68	3	NA

[1] rounded to nearest whole number as per Commonwealth Offset Assessment Guide calculator format

[2] based on the EPBC Act Offset calculator using the site-attribute scores for both the project and offset areas (Table 21 and)

[3] Based on the EO Act land-based offsets multiplier calculator

6.2.1 EPBC Act Offset Assessment Guide

The EPBC Act Environmental Offsets Policy is accompanied by the Offsets Assessment Guide which is a practical tool using a balance sheet approach to compare impacts to offsets for threatened species and ecological communities.

6.2.1.1 Ornamental snake

The ornamental snake habitat data collected from the HPE Project disturbance footprint (impact site) and the Croydon Offset Area was analysed by the Offset assessment guide impact and offset calculator to return a summary (Table 22 and Appendix D).

Associated risk of loss without the offset have estimated based on historical land management within the offset area and surrounds and those detailed for the Isaac Regional Council within *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al., 2017).

Table 22. Ornamental snake offset calculator inputs

Attribute	Score	Rationale
Time over which loss is averted	20 years	Maximum of 20 years

Attribute	Score	Rationale
Start area	259 ha	Ornamental snake habitat ground truthed within regrowth and non-remnant RE 11.4.9 within the Croydon Offset Area.
Risk of loss without offset	9%	The risk of loss without offset was derived in accordance with 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act (Maseyk et al., 2017). Ornamental snake habitat (i.e. brigalow) within the Croydon Offset Area is situated in an area classified as Category X Regulated Vegetation which is not protected under State legislation (i.e. Vegetation Management Act 1999). Brigalow was first pulled and burnt on Croydon Station in the early 1970s and seeded to buffel grass for cattle grazing. The area was pulled again in 1988 and subjected to controlled burning in 1989. This cycle of clearing and burning regrowth brigalow was repeated every 5-7 years, guided by seasonal conditions and market commodity prices. Evidence of brigalow pulling and burning was observed within ornamental snake habitat during survey of the Croydon Offset Investigation Area. Without the securement and protection of an offset, recurrent disturbance of regrowth brigalow is permissible without approval under State vegetation clearing legislation; consequently degrading ornamental snake habitat incrementally over time. As habitat within Category X Aligning with Pathway B, Maseyk et al. (2017) stipulates the ROL (without offset) must be greater than the product of the average annual background rate of loss and the time horizon of the proposed offset. The average annual background rate of loss for the Isaac Regional Council LGA over the life of the offset (20 years) is 8.42% (Maseyk et al., 2017). Based on the historical land management of Croydon Station, the ROL (without offset) is slightly higher than the average annual background rate of loss (i.e. 8.42%). As such, the ROL (without the offset) is estimated at 9%.
Risk of loss with offset	0%	The Offset Area will be legally secured and clearing activities will be restricted. The risk of losing all habitat value for ornamental snake with the offset secured is negligible.

Attribute	Score	Rationale
Confidence in result	85%	The level of certainty about the strength and effectiveness of the proposed risk-mitigation measures (i.e. legally binding mechanism) is high.
Time until ecological benefit	20 years	The brigalow (*Acacia harpophylla*) (ecologically dominant layer) within the regrowth woodland is 0.5m-4m tall within the Croydon Offset Area. In the absence of clearing, the stand will continue to naturally regenerate increasing ground cover, species richness and coarse woody debris; thereby enhancing foraging habitat for ornamental snake. Managing feral pigs and maintaining low intensity livestock grazing will reduce soil compaction and degradation in gilgai thereby also improving foraging and refuge habitat for ornamental snake in gilgai. With effective management, these ecological benefits are measurable within 20 years.
Start quality (/10) of offset area	3	The BioCondition Assessment data analysis resulted in a site-attribute score of 3/10 for ornamental snake habitat.
Future quality without offset (/10)	2	Without the protection and management provided by an offset, the future quality of ornamental snake habitat within the offset area is likely to degrade (3) in response to ongoing pasture conversion.
Future quality with offset (/10)	5	Managing the threats affecting ornamental snake habitat quality (e.g. clearing, fire, cattle and feral pigs) while facilitating natural brigalow regeneration will improve the habitat quality score (both site-based attributes and species-habitat attributes).
Confidence in result	85%	The level of certainty in the change of habitat quality is high as the management actions recommended to improve ornamental snake habitat within the Croydon Offset Area are based on published methods focusing on species priority recovery and threat abatement actions as well as brigalow regrowth management guidelines.
% of impact offset	100%	To achieve 100% offset acquittal (using the above metrics), the requisite offset area is 259 ha.
Minimum direct offset requirement met (90%)?	Yes	To achieve the minimum (90%) direct offset requirement (using the above metrics), the requisite offset area is 235 ha.

6.2.1.2 Squatter pigeon

The Commonwealth Offset Assessment guide analysed data collected from the HPE Project impact site and the Croydon Offset Investigation Area to determine the suitability of Croydon Station as an offset (Table 22 and Appendix D).

Associated risk of loss without the offset have estimated based on historical land management within the offset area and surrounds; protection under State legislation (i.e. VM Act); and those detailed for the

Isaac Regional Council within *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al., 2017).

Table 23. Squatter pigeon offset calculator inputs

Attribute	Score	Rationale
Time over which loss is averted	20 years	Maximum of 20 years
Start area	246.50 ha	Approximately 246.50 ha of squatter pigeon habitat is present within the Croydon Area of Interest.
Risk of loss without offset	5%	According to the Guidance to deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act (Maseyk et al., 2017), the estimated risk of loss for the Isaac Regional Council is 8.42%. However, as the Area of Interest contains remnant vegetation (MSES) protected under the State legislation (VM Act), the risk of loss without the offset is likely to be lower than by Maseyk et al.'s (2017) estimate.
Risk of loss with offset	0%	The Offset Area will be legally secured and clearing activities will be restricted. The risk of losing all habitat value for squatter pigeon with the offset secured is negligible.
Confidence in result	85%	The level of certainty about the strength and effectiveness of the proposed risk-mitigation measures (i.e. legally binding mechanism) is high.
Time until ecological benefit	20 years	The suitable habitat comprises remnant, woodlands within the Croydon Area of Interest. Management of vegetation and habitat, including weeds and pest fauna over the duration of the offset will improve habitat for the species with effective management, these ecological benefits are measurable within 20 years. Managing feral pests (e.g. wild dogs, feral cats) will assist in minimising threats to the species within the Offset Area.
Start quality (/10) of offset area	6	The habitat quality estimated the site-based attribute and species habitat attribute score as six out of 10 (rounded to the nearest whole number) for squatter pigeon habitat.
Future quality without offset (/10)	5	Without the protection and management provided by an offset, the future quality of squatter pigeon habitat within the offset area is likely to degrade (one point) in response to ongoing land management and lack of weed and pest management.
Future quality with offset (/10)	7	Managing the existing threats to the species (e.g. grazing management and feral cats) while improving vegetation condition will improve the habitat quality score by at least one point (both site-based attributes and species-habitat attributes).

Attribute	Score	Rationale
Confidence in result	85%	The level of certainty in the change of habitat quality is high as the management actions recommended to improve squatter pigeon habitat within the Croydon Area of Interest and manage existing threats.
% of impact offset	100%	To achieve 100% offset acquittal (using the above metrics), the requisite offset area is 228 ha.
Minimum direct offset requirement met (90%)?	Yes	To achieve the minimum (90%) direct offset requirement (using the above metrics), the requisite offset area is 205 ha.

6.2.2 EPBC Act Environmental Offsets Policy Compliance

The EPBC Act Environmental Offsets Policy (EOP) requires that offsets must deliver an overall conservation gain that compensates for the significant residual impacts associated with the HPE Project. A suitable offset must meet the offset requirements of the EOP. Compliance of the Croydon Offset Area as proposed in this strategy with the EOP is demonstrated in Table 24.

Table 24. Croydon Station offset area compliance with EPBC Act EOP offset requirements

EPBC EOP offset requirements	Rationale
Deliver an overall conservation outcome that improves or maintains the viability of the protected matter	The Croydon Offset Area supports confirmed ornamental snake and squatter pigeon habitat. With formal protection and land management, the viability of habitat for target species will be improved by promoting the recovery of the species thereby delivering an overall conservation outcome.
Be built around direct offsets but may include other compensatory measures	The full offset requirement will be delivered via a direct, land-based offset within the Croydon Offset Area.
Be in proportion to the level of statutory protection that applies to the protected matter AND Be of a size and scale proportionate to the residual impacts on the protected matter	The proposed offset will provide a direct offset and measurable conservation gain. The proposed offsets have been developed using the OAG (Section 6.2.1) which uses the area of impact and the quality of habitat to assess the total quantum of impact to protected matters that needs to be offset.
Effectively account for and manage the risks of the offset not succeeding	Potential risks to the success of the offsets have been identified at an overall level and are reflected in the OAG inputs (Section 6.2.1). A detailed risk assessment has been developed as part of the OAMP. The OAMP also includes measures (such as regular monitoring), triggers and remedial actions to manage risk.

EPBC EOP offset requirements	Rationale
Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs	The proposed Croydon Offset Area does not have any existing formal conservation arrangement in place or existing requirements from other approvals that require the landowner or licensees to undertake conservations works. Current permitted land use across the offset area includes cattle grazing.
Be efficient, effective, timely, transparent, scientifically robust and reasonable	Direct, land-based offsets have been selected as the preferred offset method for this project as it is a robust and widely accepted approach, with a high degree of confidence in outcome.
Have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The offset will be secured using a Voluntary Declaration under the provisions of the VM Act and supported by an OAMP. The OAMP will detail the monitoring and reporting program.

6.2.3 EO Act Land-based Offsets Multiplier Calculator

In accordance with the *Queensland Environmental Offsets Policy* (DES, 2021), the offset requirement for a significant residual impact on a MSES connectivity area is set at a maximum multiplier of 1 (i.e. 1:1 ratio).

Based on the DES Impact Assessment Tool Environmental Offset Calculator, the Croydon Offset Area contains suitable habitat to acquit more than 100% of the significant residual impacts on MSES connectivity area, containing 321.77 ha of regrowth vegetation for the required 84.19 ha impacted by the Project.

Table 25. Justification of conservation outcome for MSES within the Croydon Offset Area

Offset Plan requirements	Rationale
Describe the prescribed environmental matter to which the offset condition relates	The Croydon Offset Area will acquit Project impacts to MSES connectivity area, containing suitable areas of regrowth vegetation (non-remnant).
State whether the offset condition will be delivered, wholly or partly, on the land on which the environmental offset will be undertaken	The Croydon Offset Area will acquit the entirety (100%) of the required impacts (84.19 ha) to MSES Connectivity area associated with the Project. In accordance with the *Queensland Environmental Offsets Policy*, MSES connectivity area is to be offset at a multiplier of 1. A total of 84.19 ha of non-remnant vegetation, characteristic of RE 11.4.9 will directly acquit 100% of HPE Project impacts to MSES connectivity area.
Include particulars of, or a description sufficient to identify, the land on which the environmental offset will be undertaken	The Croydon Offset Area comprises parts of the cadastral parcel formally referred to as Lot 4 on Plan KL210.
Identify, and contain details of, any person with an interest in the land on which the environmental offset will be undertaken	Landowner and manager.

Offset Plan requirements	Rationale
Describe the existing land use of the land on which the environmental offset will be undertaken and any impact that land use may have on the delivery of the offset	The Croydon property currently supports cattle grazing with selected areas previously tilled for pasture/fodder. The Offset Area within the property comprises a 321.77 ha area largely characterised by regrowth brigalow (*Acacia harpophylla*) shrublands on undulating clay plains. An existing BMC offset area, approximately 361 ha is secured within Croydon Station adjacent to the Croydon Offset Area and is undergoing active management. The proposed Offset Area will be fenced to exclude any livestock grazing and managed in accordance with an Offset Area Management Plan.
State— (i) the measures the authority holder will take to secure the land on which the environmental offset will be undertaken as a legally secured offset area	The Croydon Offset Area will be legally secured into perpetuity in accordance with the Queensland Environmental Offset Policy via: • an environmental offset protection area under section 30 of the *Environmental Offsets Act 2014*; or • an area declared as an area of high nature conservation value under section 19F of the *Vegetation Management Act 1999*, where it is secured for the purposes of an offset
Why the authority holder considers the stated measures are reasonable and practicable	The securement of the offset under through either instrument identified above will protect the vegetation from future clearing activities. Risk assessment and identification of management action within the OAMP will further assist in mitigating potential risks, including force majeure, and improving condition (i.e. weed management, livestock management, revegetation etc.). As such, the effective application of these methods are considered reasonable and practicable to secure the Offset Area and associated ecological values.
The period during which the authority holder will take the measures	In accordance with Section 2.3.1.5 of the Queensland Environmental Offset Policy (DES, 2021), the Croydon Offset Area will be actively managed until: • the administering agency is satisfied the actions and obligations of the offset delivery plan have been completed in full; and • the offset has been secured for at least the same duration as the impact on the prescribed environmental matters arising from the prescribed activity.

Offset Plan requirements	Rationale
Why the authority holder considers the stated period is reasonable for the purpose of securing the land.	Provided the effective application of the methods described in the OAMP (e.g. livestock management, revegetation and weed/pest management) are implemented, paired with favourable environmental conditions (e.g. sufficient rainfall), improvements in habitat quality may be realised (or quantifiable/discernible) within twenty years. However, as per the Queensland Environmental Offset Policy, securement of the offset will be required as detailed above.

7 Offset Delivery

7.1 Timeframes for offset delivery

The final offsets package will be included as part of the assessment process for the HPE Project. An Offset Area Management Plan (OAMP) has also been developed for each property as a component of this strategy. It is the intent that the Offset Areas will be secured prior to or within 12 months of disturbance associated with the HPE Project. It is anticipated the Offset Areas will be in place until the completion criteria are met for a minimum of 20 years (whichever is longer).

Both this strategy and associated OAMPs will be implemented as required, post approval of the Project.

7.2 Offset legal security

The Offset Areas will be legally secured in accordance with the Queensland Environmental Offset Policy via:

- an environmental offset protection area under section 30 of the *Environmental Offsets Act 2014*; or
- an area declared as high nature conservation value under section 19F of the *Vegetation Management Act 1999*, where it is secured for the purposed of an offset (i.e. Voluntary Declaration).

7.3 Offset area management plan

The OAMPs for each Offset Area will guide the ongoing management and monitoring and will be implemented for the life of the offset. OAMPs produced for the Inderi and Croydon Offset Areas include:

- *Horse Pit Extension Project Offset Area Management Plan: Croydon Offset Area* (E2M, 2023); and
- *Horse Pit Extension Project Offset Area Management Plan: Inderi Offset Area* (E2M, 2022b).

7.3.1 OAMP structure and inclusions

The OAMPs include the following:

- a description of the offset area/s, including location, size, condition, environmental values present and surrounding land uses;
- details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset;
- maps and shapefiles to clearly define the location and boundaries of the offset areas, accompanied by the offset attributes (e.g. physical address of the offset areas, the listed threatened species and communities that the environmental offsets compensate for and the size of the environmental offsets in hectares);
- specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20 year period;
- details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria;
- details of the nature, timing and frequency of monitoring to inform progress;

- proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved;
- timing for the implementation of corrective actions if monitoring activities indicate the interim milestones have not been achieved;
- risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with a risk assessment matrix;
- evidence of how the management actions and corrective actions consider relevant approved conservation advice and are consistent with relevant recovery plans and threat abatement plans;
- details of the legal mechanism for legally securing the proposed offset area/s, such that legal security remains in force over the offset area/s for at least 20 years to provide enduring protection for the offset area/s against development incompatible with conservation.

7.3.2 Overview of proposed management and monitoring activities

The overall management objective of the proposed offset area on the Inderi property and Croydon Station is to reduce threatening processes and increase the habitat quality of the area to a level at which it provides greater conservation value than its current form and that of the current impact site.

Management measures that will be undertaken are set out in detail in the OAMPs and include:

- reduced livestock grazing intensity during the dry season as necessary to reduce fuel loads and manage potential bushfire risk while maintaining a minimum groundcover of at least 50% throughout the Offset Area;
- prohibition of cultivation and general vegetation clearing impacts; and
- weed and pest animal identification, prevention and control.

There are also a number of specific restrictions that will apply to the offset area in order to support the delivery of conservation benefits for target protected matters. These restrictions are:

- vegetation clearing is prohibited;
- grazing is restricted during the wet season to allow D. queenslandicum within the Inderi Offset Area, to flower, seed and disperse promote natural regeneration and replenish the soil seed bank;
- planned fires are prohibited other than for ecological purposes; and
- introduction of feral animals and weeds will be minimised and existing populations suppressed.

Monitoring of the Offset Areas will occur in accordance with the regime specified in the OAMPs and across designated locations. Habitat Quality monitoring sites within the Croydon and Inderi Offset Areas will be based on the sites assessed as part of the initial offset investigations (i.e. BioCondition) and used to determine baseline habitat quality.

Weed and groundcover monitoring will be undertaken at each of the Habitat Quality monitoring sites as well as opportunistic locations during regular monitoring events. These opportunistic locations will be in areas where regeneration, or weed occurrences are notably different from other areas representative of the offset area generally. Additional monitoring activities will include:

- feral animal and weed monitoring conducted concurrently with BioCondition;
- manager monitoring of grazing, pest plants, pest animals fencing, access and fire breaks.

All monitoring results (including leaseholder / property manager observations) are to be recorded in documented or electronic form suitable for external audit. Reports will be provided to the relevant authorities for review as required.

8 Conclusion

The development of the Horse Pit Extension Project is likely to have a significant residual impact on five prescribed environmental matters: ornamental snake habitat (MNES/MSES), squatter pigeon (southern) habitat (MNES/MSES), king bluegrass habitat (MNES/MSES), Regulated Vegetation containing an Of Concern RE (MSES) and Connectivity Areas (MSES).

The offset investigation concluded that the Inderi Property and Croydon Station OIAs are suitable to deliver proponent-driven, land-based offsets to acquit 100% of the Project impacts to:

- ornamental snake habitat (on Croydon);
- squatter pigeon (southern) habitat (on Croydon);
- king bluegrass habitat (on Inderi);
- Regulated Vegetation (on Inderi); and
- Connectivity area (on Croydon)

A summary of Offset Suitability is summarised in Table 26.

Table 26. Summary of offset suitability

Target Protected Matter	Impact Site			Inderi Offset			Croydon Offset			
	Significant Residual Impact (ha)	Site-attribute score (/10)	Species-habitat attribute score (/10)	Area available within Offset Area (ha)	Site-attribute score (/10)	Area required to acquit 100% impact (ha)	Area available within Offset Area (ha)	Site-attribute score (/10)	Species-habitat attribute score (/10)	Area required to acquit 100% impact (ha)
MNES										
Dichanthium queenslandicum habitat	23.40	3	N/A	66.61	5	33.00	0	N/A	N/A	N/A
ornamental snake habitat	167.84	4	6	0	N/A	N/A	263.68	3	7	259[1]
squatter pigeon habitat	88.53	5	5	0	N/A	N/A	246.50	6	6	228[1]
MSES										
Regulated Vegetation (of concern RE (BVG 30b)	23.40	3	N/A	39.83	4	34.00	N/A	N/A	N/A	N/A
Connectivity Areas	84.19	5	N/A	Not required for offset			263.68	3	N/A	84.19

[1] based on the results of the EPBC Act Offset Assessment Guide using site-based attribute data (BioCondition assessment)

9 References

Acton, J. 2018. Written correspondence between the Croydon Station landholder and BHP regarding land clearing history and the future intent to continue clearing on Croydon Station.

Atlas of Living Australia. (2022). *Atlas of Living Australia Occurrence Records (ALA)*. https://www.ala.org.au/

Bureau of Meteorology. (2022). *Climate Data Online*. http://www.bom.gov.au/climate/data/

Cropper, S. (1993). *Management of Endangered Plants*. CSIRO Publishing.

Cunningham, G. M., Mulham, W. E., Milthorpe, P. L., & Leigh, J. H. (1981). *Plants of Western New South Wales*. 158.

Department of Agriculture, Water and the Environment. (2022). *Protected Matters Search Tool*. http://www.environment.gov.au/epbc/pmst/

Department of Climate Change, Energy, the Environment and Water. (2022). *Species Profile and Threats Database*. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Department of Environment and Energy. (2012). *Offsets Assessment Guide*. Commonwealth of Australia.

Department of Environment and Heritage Protection. (2014). *Land-based Offset Multiplier Calculator Tool*. Queensland Government.

Department of Environment and Heritage Protection. (n.d.). *Combined Offset Delivery Calculator (Version 1.1)*. Queensland Government.

Department of Environment and Science. (2019a). *QGov Species profile—Cyperus clarus*. Species Profiles. https://apps.des.qld.gov.au/species-search/details/?id=9855

Department of Environment and Science. (2019b). *QGov Species profile—Digitaria porrecta*. Species Profiles. https://apps.des.qld.gov.au/species-search/details/?id=14599

Department of Environment and Science. (2021). *Queensland Environmental Offsets Policy (Version 1.10)*. Department of Environment and Science.

Department of Environment and Science. (2022). *Wildlife Online Extract*. Department of Environment and Science.

Department of Environment and Science (DES). (2018). *WildNet wildlife records* [Dataset]. Department of Environment and Science.

Department of Environment and Science (DES). (2019). *Matters of State Envrionmental Significance*. Department of Environment and Science.

Department of Environment and Science (DES). (2021). *Guide to determining terrestrial habitat quality (Version 1.3): Methods for assessing habitat quality under the Queensland Environmental Offsets Policy*. Department of Environment and Science.

Department of Environment and Science (DES). (2022). *Species profile—Dichanthium queenslandicum*. Species Profiles. https://apps.des.qld.gov.au/species-search/details/?id=11064

Department of Resources. (2020). *Queensland Detailed Surface Geology*. Department of Resources. https://qldspatial.information.qld.gov.au/catalogue/custom/detail.page?fid={9BA2F66C-1933-4439-B9C9-E631911ADD7E}

Department of Resources. (2022). *QImagery*. QImagery. https://qimagery.information.qld.gov.au/

Department of Resources (DoR). (2022). *Vegetation management regulated vegetation management map—Version 6.0* [Map]. Department of Resources. https://www.data.qld.gov.au/dataset/vegetation-management-act-series

Department of Sustainability, Environment, Water, Population and Communities. (2011a). *Draft referral guidelines for the nationally listed Brigalow Belt reptiles*. Australian Government. https://www.awe.gov.au/sites/default/files/documents/draft-referral-guidelines-comment-brigalow-reptiles.pdf

Department of Sustainability, Environment, Water, Population and Communities. (2011b). *Survey guidelines for Australia's threatened reptiles*. Australian Government.

Department of Sustainability, Environment, Water, Population and Communities. (2012). *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. Australian Government.

Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). (2013). *Approved Conservation Advice for Dichanthium queenslandicum (king blue-grass)*. Department of Sustainability, Environment, Water, Population and Communities. http://www.environment.gov.au/biodiversity/threatened/species/pubs/5481-conservation-advice.pdf

Department of the Environment. (2013). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community*. Department of the Environment. http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservationadvice. pdf

Department of the Environment, Water, Heritage and the Arts. (2010). *Survey guidelines for Australia's threatened birds*. Australian Government.

E2M Pty Ltd (E2M). (2023). *Horse Pit Extension Project Offset Area Management Plan: Croydon Offset Area*. E2M Pty Ltd.

E2M Pty Ltd (E2M). (2022b). *Horse Pit Extension Project Offset Area Management Plan: Inderi Offset Area*. E2M Pty Ltd.

Eco Logical Australia. (2016). *GCOS – Croydon property offset values assessment*. Eco Logical Australia.

Eyre, T. J., Ferguson, D. J., Hourigan, C. L., Smith, G. C., Mathieson, M. T., Kelly, A. L., Venz, M. F., Hogan, L. D., & Rowland, J. (2018). *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland*. Department of Environment and Science.

Eyre, T. J., Kelly, A. L., Neldner, V. J., Wilson, B. A., Ferguson, D. J., Laidlaw, M. J., & Franks, A. J. (2015). *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual Version 2.2*. Queensland Herbarium, Department of Science, Information Technology, Innovation and Arts.

Geoscience Australia. (2020). *Ordered Drainage 100K - Queensland—By area of interest*. Geoscience Australia.

Goff, F. G., Dawson, G. A., & Rochow, J. J. (1982). Site examination for threatened and endangered plant species. *Environmental Management*, *6*(4), 307–316. https://doi.org/10.1007/BF01875062

Kerswell, A., Kaveney, T., Evans, C., & Appleby, L. (2020). *Central Queensland Threatened Species Habitat Descriptions (V4)*. Commissioned by BHP.

Maseyk, F., Evans, M., & Maron, M. (2017). *Guidance for deriving "Risk of Loss" estimates when evaluating biodiversity offset proposals under the EPBC Act*. The University of Queensland.

NearMap. (2020). *NearMap Australia*. NearMap.Com. https://admin.nearmap.com/api/identityserver/v1/login?signin=578abbcd6c074fc18f7cf47132887202

Neldner, V. . J., Niehus, R. E., Wilson, B. A., McDonald, W. J. F., Ford, A. J., & Accad, A. (2021). *The Vegetation of Queensland: Descriptions of Broad Vegetation Groups Version 5*. Department of Environment and Science.

Neldner, V. J., Wilson, B. A., Dillewaard, H. A., Ryan, T. S., Butler, D. W., McDonald, W. J. F., Richter, D., Addicott, E. P., & Appelman, C. N. (2022). *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland v.6.0*. Queensland Herbarium, Queensland Department of Environment and Science.

Queensland Herbarium. (2017). *Herbarium Specimen Data (HERBRECS)* [Map]. Department of Environment and Science.

Queensland Herbarium. (2021). *Regional Ecosystem Description Database (REDD). Version 12*. Department of Environment and Science.

Specht, R. L. (1970). Vegetation. In *Australian Environment* (4th ed., pp. 44–67). Melbourne University Press.

Stanley, T., & Ross, E. (1989a). *Flora of South-eastern Queensland, Volume 3*. Department of Primary Industries.

Stanley, T., & Ross, E. (1989b). *Flora of South-eastern Queensland, Volume 3*. Department of Primary Industries.

Stanley, T., & Ross, E. (1989c). *Poaceae. Flora of South-eastern Queensland*. *3*, 230.

Threatened Species Scientific Committee. (2009). *Commonwealth Listing Advice on Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin*. Department of the Environment, Water, Heritage and the Arts.

Veldkamp, J. F. (1992). Notes on Australian Coreopsidinae (Compositae). *Austrobaileya*, *3*(4), 743.

Webster, R. D. (1987). *The Australian Paniceae (Poaceae)*. 62–63.

Wilson, B. A., Nelder, V. J., & Accad, A. (2002). *The extent and status of remnant vegetation in Queensland and its implications for statewide vegetation management and legislation*.

Wilson, K. L. (1991). Systematic studies in Cyperus section Pinnati (Cyperaceae). *Telopea*, *4*(3), 480.

Appendix A Database search results

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

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

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

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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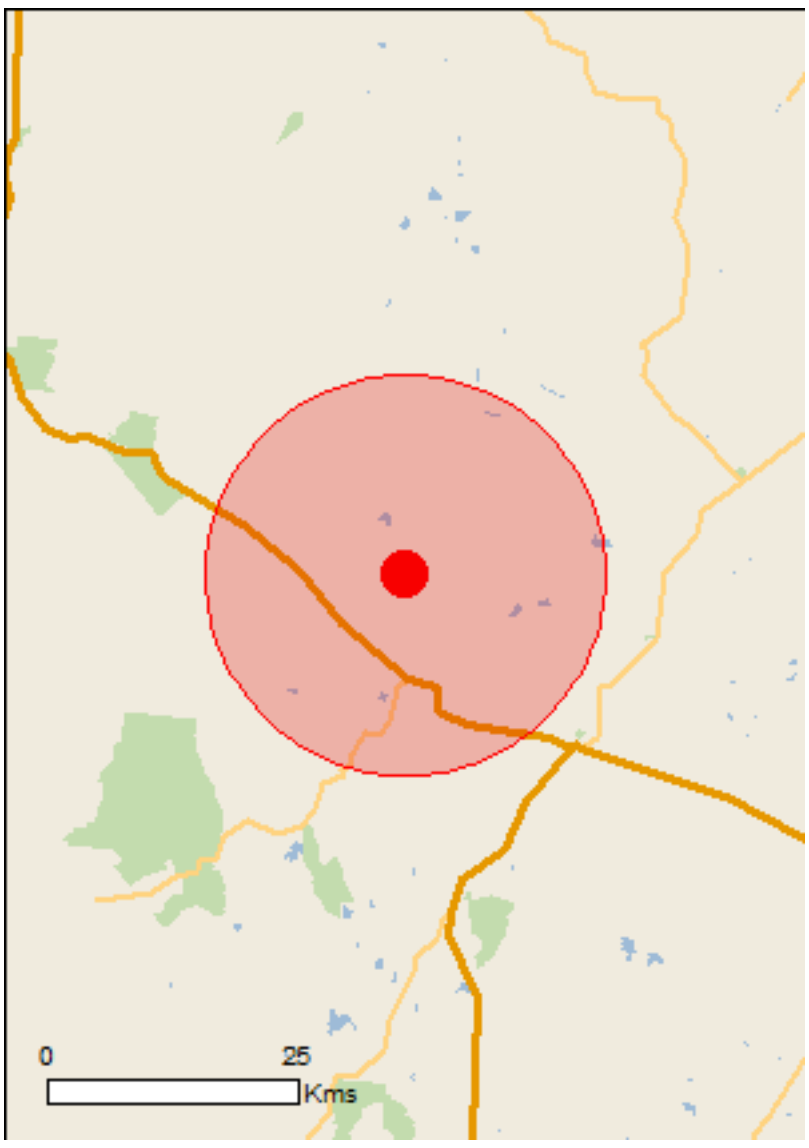

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

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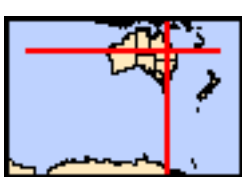

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	18
Listed Threatened Species:	23
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	20
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Aristida annua [17906]	Vulnerable	Species or species habitat likely to occur within area
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat known to occur within area
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat known to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat known to occur within area
Marsdenia brevifolia [64585]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Albinia	QLD
Albinia	QLD
Albinia	QLD

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area

Caveat

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

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

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

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- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-24.3238 148.4711

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
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-Department of Environmental and Heritage Protection, Queensland
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-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
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-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

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

Please feel free to provide feedback via the Contact Us page.

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Australian Government

Department of Agriculture, Water and the Environment

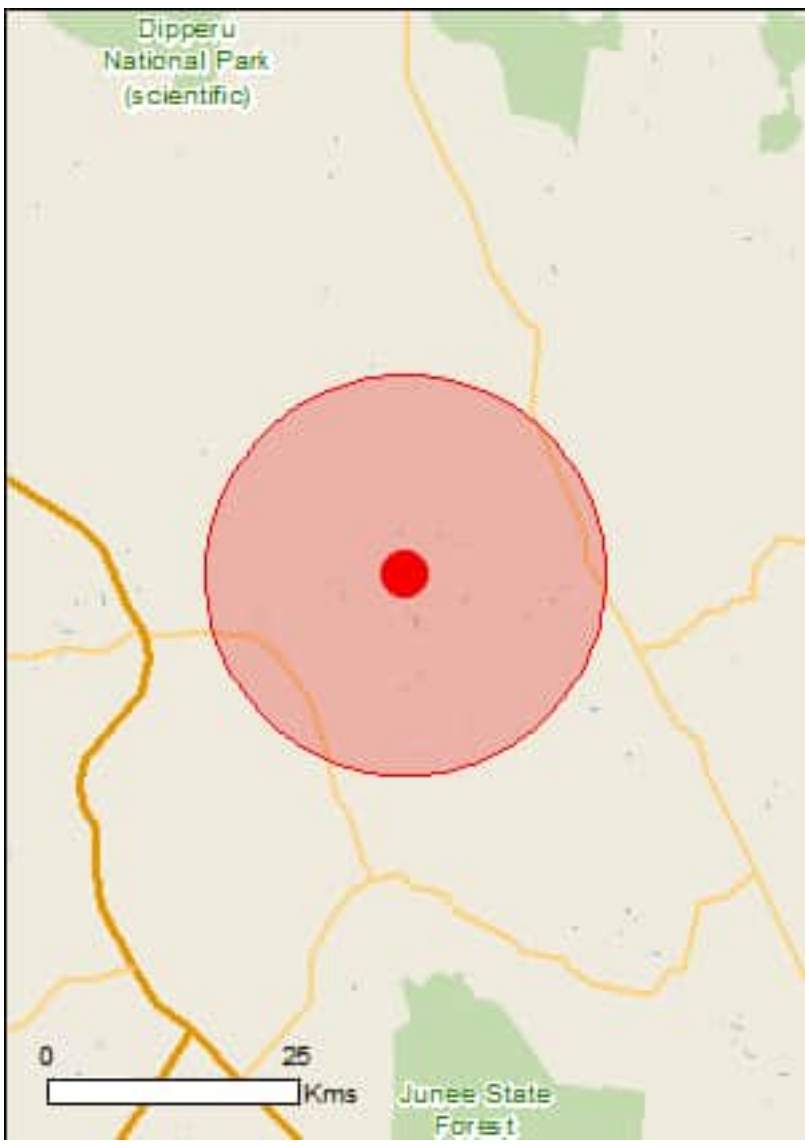
EPBC Act Protected Matters Report

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

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

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

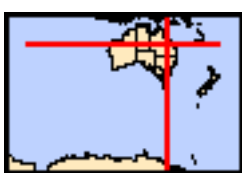
Report created: 03/06/21 11:28:58



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates

Buffer: 20.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	28
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	18
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

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

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Plants		
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat may occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat known to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat known to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
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Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
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Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

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Coordinates

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Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Lot: 55 Plan: DSN318

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the Queensland Herbarium's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Resources website https://www.dnrme.qld.gov.au/

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

Table of Contents

Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

Table 1: Area of interest details: Lot: 55 Plan: DSN318

Size (ha)	3,046.05
Local Government(s)	Central Highlands Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Basalt Downs
Catchment(s)	Fitzroy

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

Table 2: Summary table, biodiversity status of regional ecosystems within the AOI

Biodiversity Status	Area (Ha)	% of AOI
Endangered	0.0	0.0
Of concern	1,731.43	56.84
No concern at present	421.45	13.84
Total remnant vegetation	2,152.88	70.68

Refer to **Map 2** for further information.

Regional Ecosystems

1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and are usually distinguished by differences in dominant species, frequently in the shrub or ground layers and are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

A published methodology for survey and mapping of regional ecosystems across Queensland (Neldner et al 2020) provides further details on regional ecosystem concepts and terminology.

This report provides information on the type, status, and extent of vegetation communities, regional ecosystems and broad vegetation groups present within a user specified area of interest. Please note, for the purpose of this report, the Biodiversity Status is used. This report has not been developed for application of the *Vegetation Management Act 1999* (VMA). Additionally, information generated in this report has been derived from the Queensland Herbarium's Regional Ecosystem Mapping, and not the regulated mapping certified for the purposes of the VMA. If your interest/matter relates to regional ecosystems and the VMA, users should refer to the Department of Resources website.

https://www.dnrme.qld.gov.au/

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

**Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

***Rare regional ecosystem: pre-clearing extent (1000 ha); or patch size (100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

*****Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.*

2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

Table 3: Remnant regional ecosystems, description and status within the AOI

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
11.3.3	Eucalyptus coolabah woodland on alluvial plains	Of concern	191.49	6.29
11.3.3a	Eucalyptus coolabah woodland on alluvial plains	Of concern	90.83	2.98
11.3.4	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Of concern	287.23	9.43
11.4.2	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Of concern	110.34	3.62
11.8.11	Dichanthium sericeum grassland on Cainozoic igneous rocks	Of concern	1,051.54	34.52
11.8.5	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	No concern at present	421.45	13.84
non-remnant	None	None	893.11	29.32

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

Table 4 provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

Table 4: Remnant regional ecosystems within the AOI, additional information

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.3.3	Pre-clearing 930000 ha; Remnant 2019 272000 ha	16c	Floodplain (other than floodplain wetlands).	Low
11.3.3a	Pre-clearing 930000 ha; Remnant 2019 272000 ha	21b	Riverine wetland or fringing riverine wetland.	Low
11.3.4	Pre-clearing 684000 ha; Remnant 2019 180000 ha	16c	Floodplain (other than floodplain wetlands).	Low
11.4.2	Pre-clearing 196000 ha; Remnant 2019 34000 ha	17a	None	Low
11.8.11	Pre-clearing 602000 ha; Remnant 2019 170000 ha	30b	None	Low

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.8.5	Pre-clearing 632000 ha; Remnant 2019 346000 ha	11a	None	Low
non-remnant	None	None	None	None

Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

Table 5: Remnant regional ecosystems within the AOI, special values

Regional Ecosystem	Special Values
11.3.3	Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992, Venz et al. 2002). 11.3.3c: Mature trees provide hollows for fauna especially nesting birds. Associated with a high number of fauna species (Dick 1992, Venz et al. 2002).
11.3.3a	Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992, Venz et al. 2002). 11.3.3c: Mature trees provide hollows for fauna especially nesting birds. Associated with a high number of fauna species (Dick 1992, Venz et al. 2002).
11.3.4	Potential habitat for NCA listed species: Acacia pedleyi, Callicarpa thozetii, Cycas megacarpa, Cycas ophiolitica, Digitaria porrecta, Eriocaulon carsonii subsp. orientale, Livistona nitida, Rhaponticum australe, Samadera bidwillii, Sannantha brachypoda. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus).
11.4.2	Potential habitat for NCA listed species: Solanum adenophorum
11.8.11	Habitat for threatened plant species including Trioncinia retroflexa and Dichanthium queenslandicum. T. retroflexa is currently known from three small populations.
11.8.5	In southern part of bioregion, habitat for a number of threatened plant species including Picris evae and Thesium australe and near threatened species Digitaria porrecta and Discaria pubescens. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus). 11.8.5a: This ecosystem is known to provide suitable habitat for koalas (Phascolarctos cinereus).
non-remnant	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at:

https://publications.qld.gov.au/dataset/redd/resource/

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

Table 6: Broad vegetation groups (1 million) within the AOI

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	893.11	29.32
11a	Moist to dry open forests to woodlands dominated by Eucalyptus orgadophila (mountain coolibah). Some areas dominated by E. tereticornis (blue gum), E. melliodora (yellow box), E. albens (white box), E. crebra (narrow-leaved red ironbark) or E. melanophloia (silver-leaved ironbark). (land zones 8, 11, 4, [3]) (BRB, SEQ, EIU)	421.45	13.84
16c	Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	478.71	15.72
17a	Woodlands dominated by Eucalyptus populnea (poplar box) (or E. brownii (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges. (land zones 3, 5, 10, 9, 4, 11, 12, [8]) (BRB, MUL, DEU, MUL, EIU)	110.34	3.62
21b	Low open woodlands and tall shrublands of Melaleuca citrolens or M. stenostachya or other Melaleuca spp. (land zones 5, 3, 7, 10, 11, 12) (GUP, CYP, EIU, DEU, BRB, [SEQ])	90.83	2.98
30b	Tussock grasslands dominated by Astrebla spp. (mitchell grass) or Dichanthium spp. (bluegrass) often with Iseilema spp. on undulating downs or clay plains. (land zones 9, 3, 4, 8, [5]) (MGD, CHC, GUP, BRB, [EIU, DEU, NWH])	1,051.54	34.52

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

The descriptions are compiled using site survey data from the Queensland Herbarium's CORVEG database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2020 (PDF)* section 3.3 of:

https://publications.qld.gov.au/dataset/redd/resource/

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community.

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

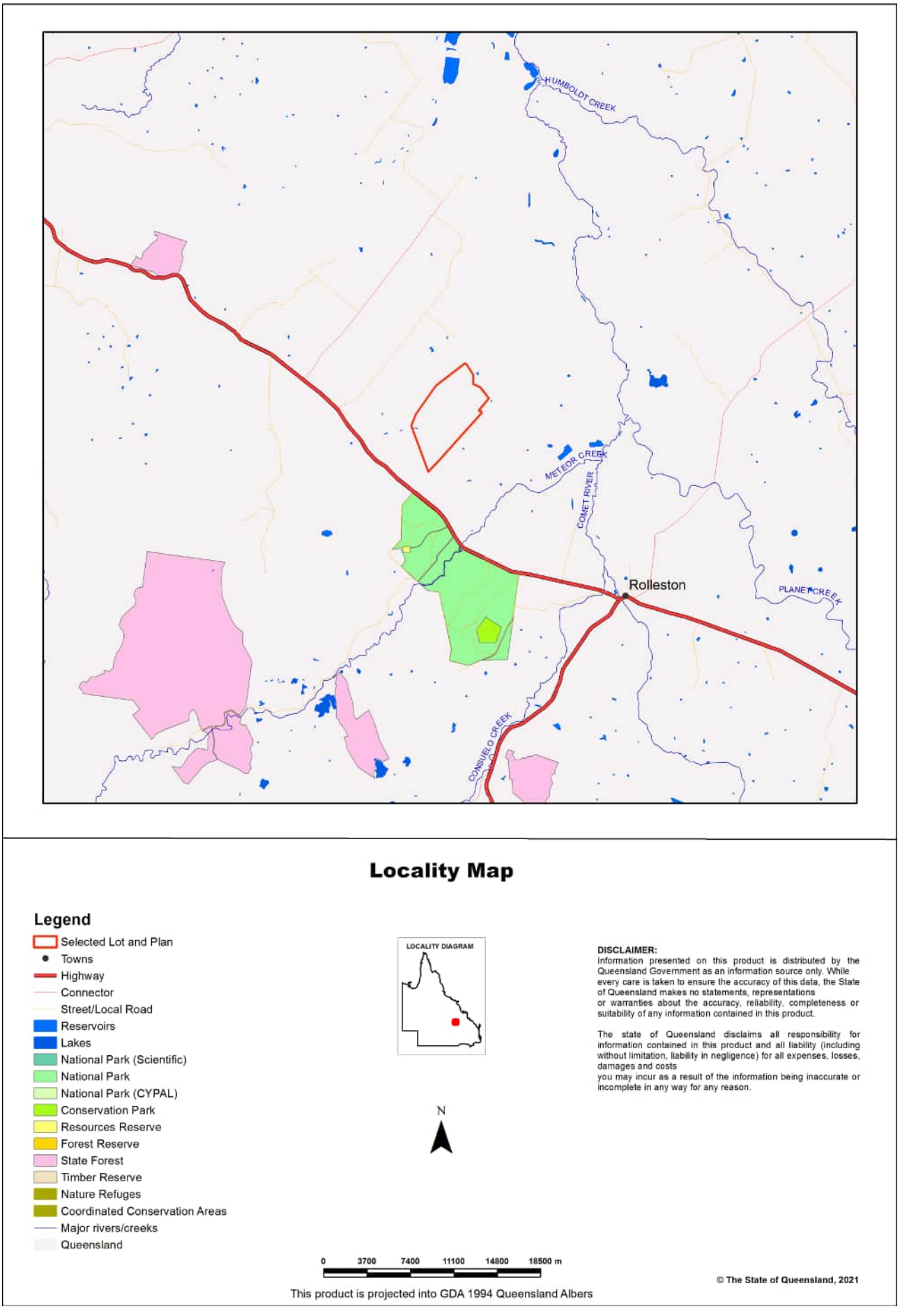
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

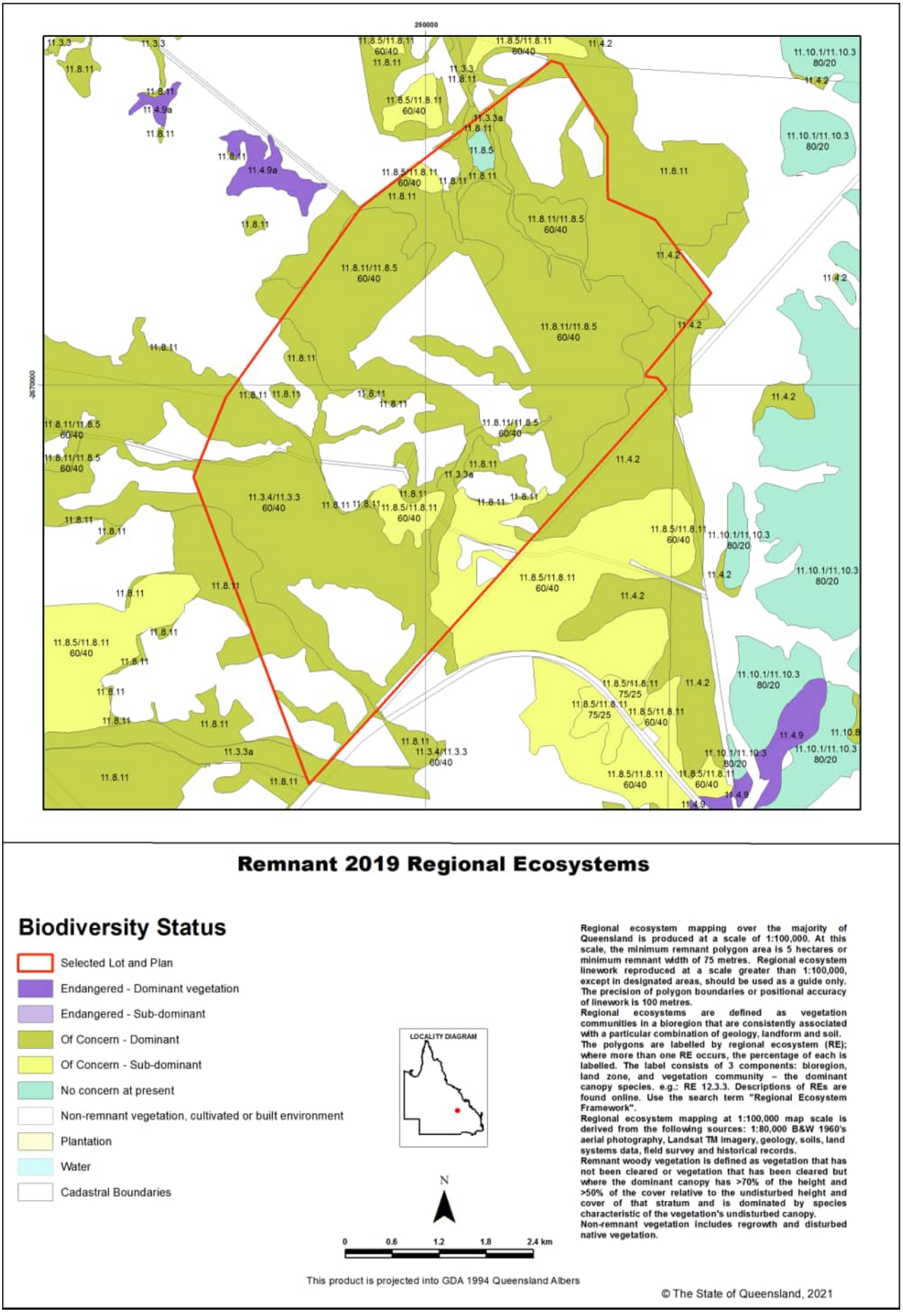
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.3.3	Available	Available
11.3.3a	Available	Not currently available
11.3.4	Available	Available
11.4.2	Available	Available
11.8.11	Available	Available
11.8.5	Available	Available
non-remnant	Not currently available	Not currently available

Maps

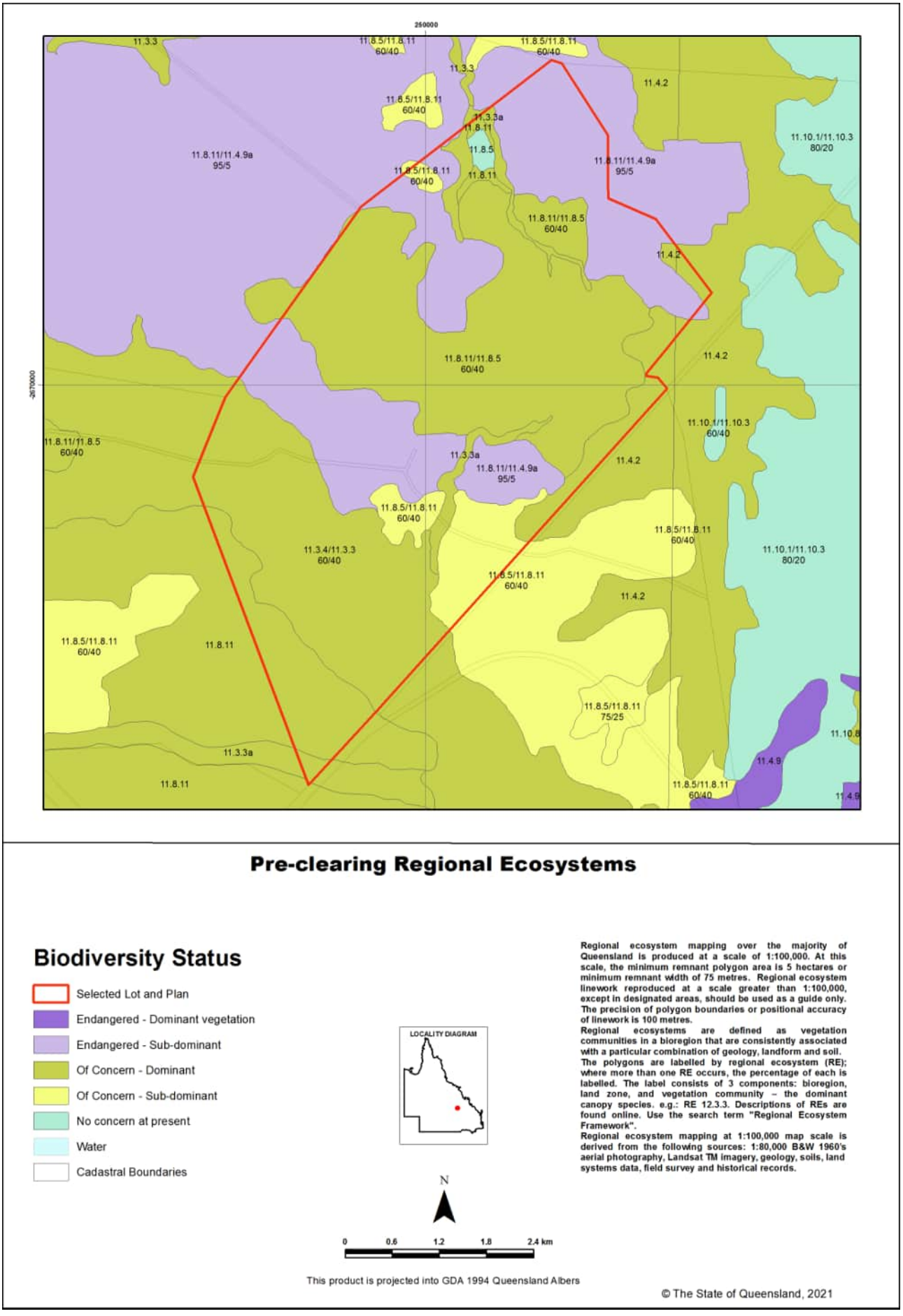
Map 1 - Location



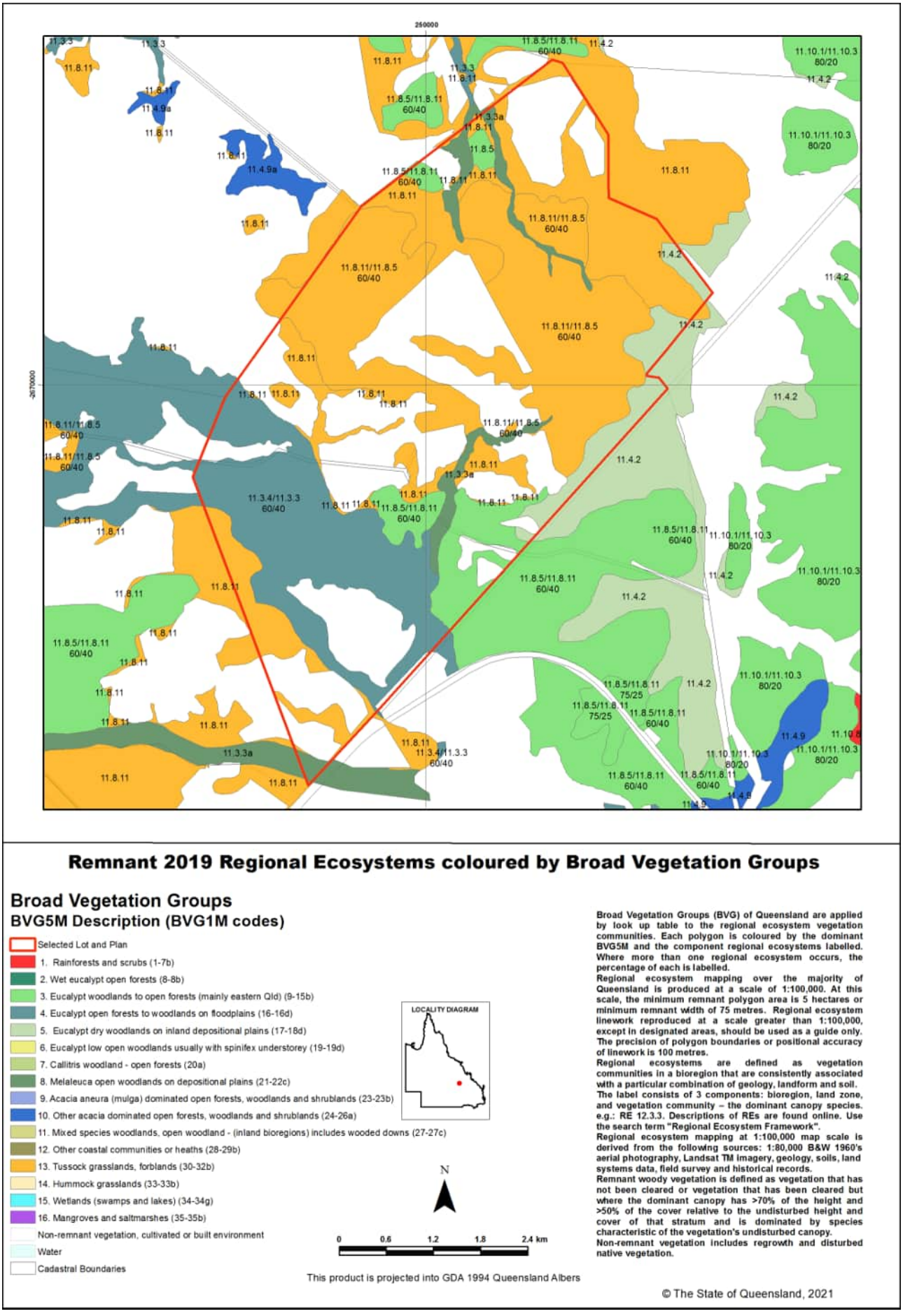
Map 2 - Remnant 2019 regional ecosystems



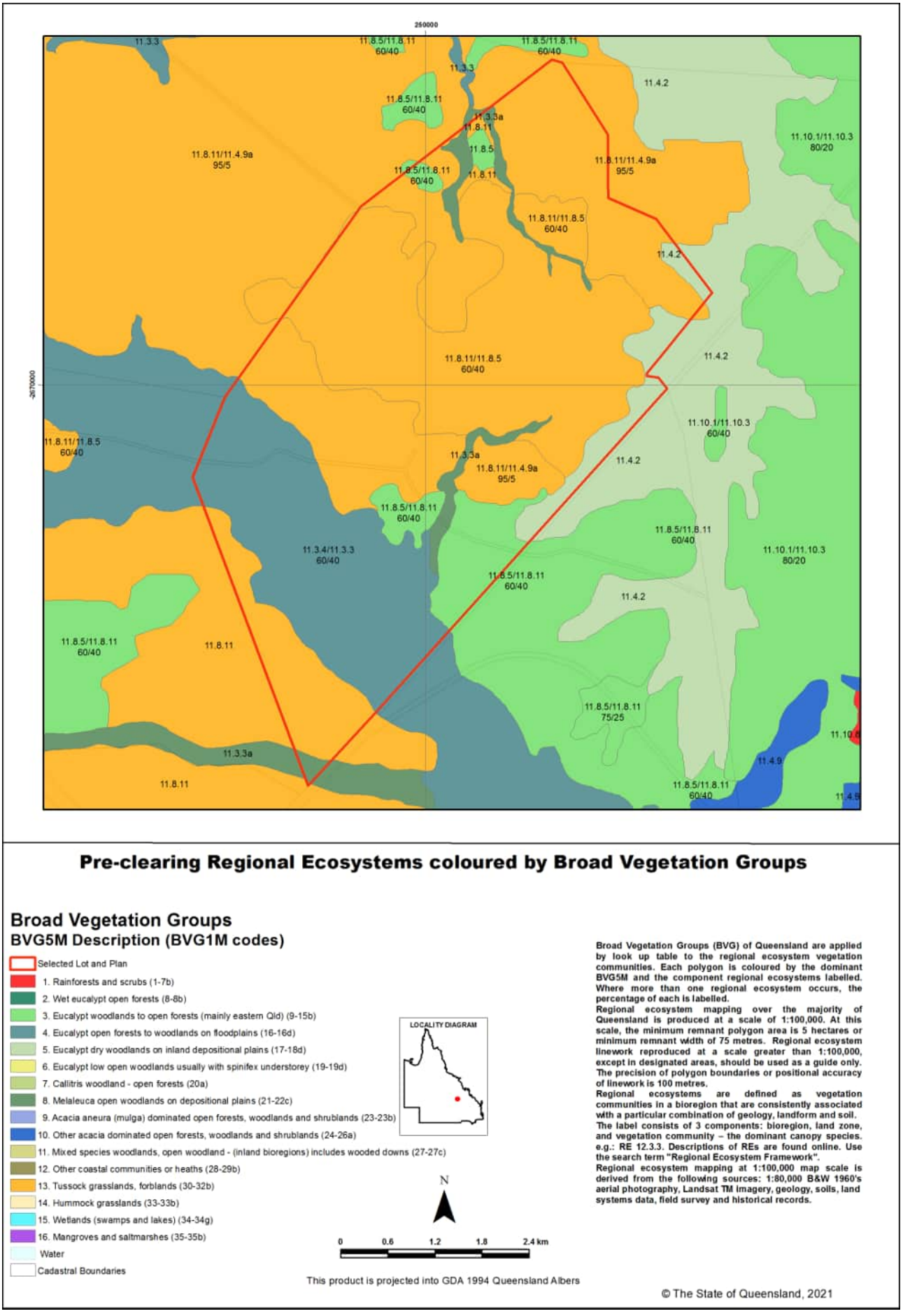
Map 3 - Pre-clearing regional ecosystems



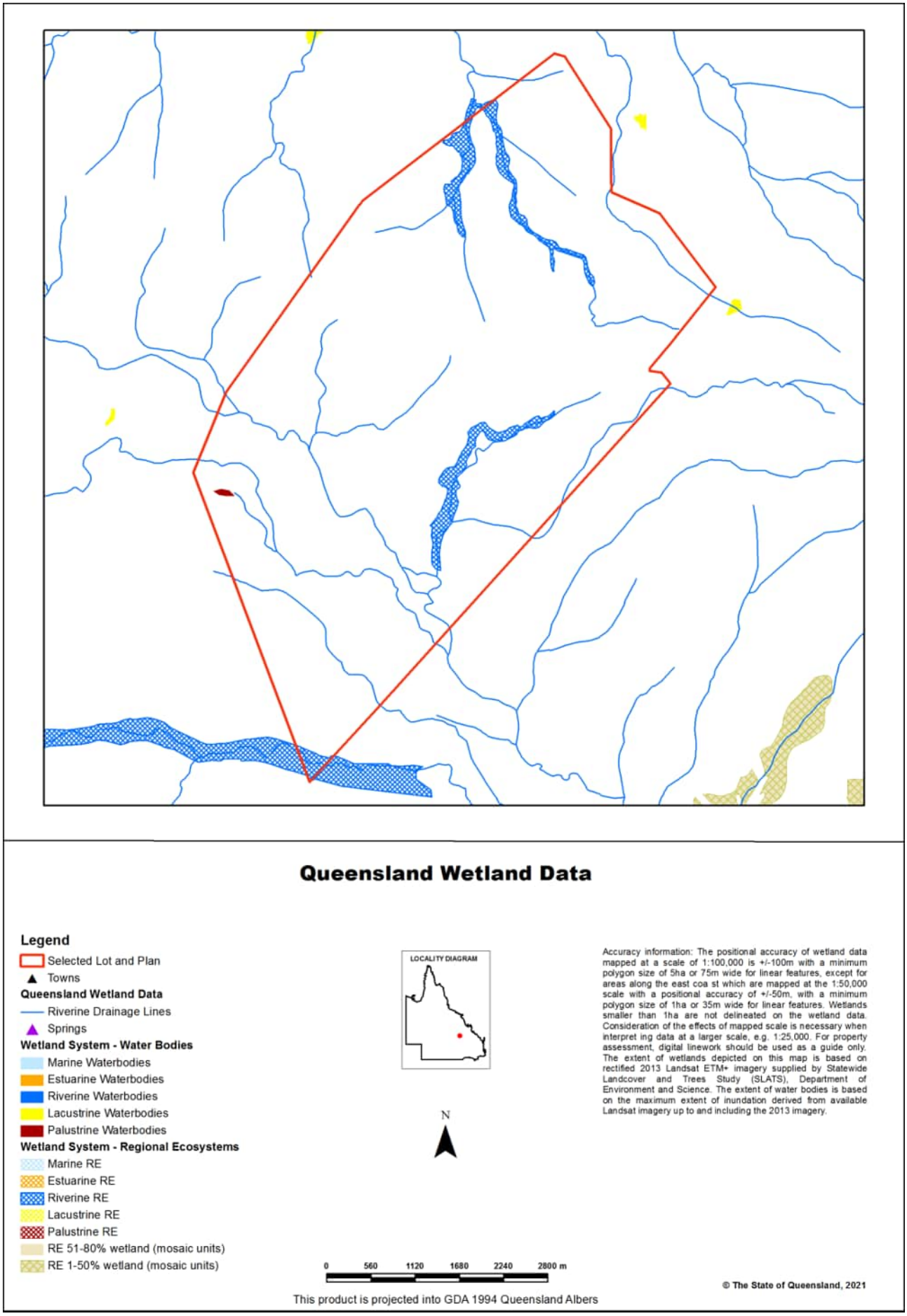
Map 4 - Remnant 2019 regional ecosystems by BVG (5M)



Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of Environment and Science's Website -

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

The methodology for mapping regional ecosystems can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

Technical descriptions for regional ecosystems can be obtained from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

Benchmarks can be obtained from:

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Government Information System portal,

http://dds.information.qld.gov.au/dds/

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link:

http://www.dnrm.qld.gov.au/mapping-data/queensland-globe

References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2019). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 4.0. Queensland Herbarium, Department of Environment and Science.

(https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2020). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 5.1. Updated March 2020. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

(https://publications.qld.gov.au/dataset/redd/resource/6dee78ab-c12c-4692-9842-b7257c2511e4)

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

http://dds.information.qld.gov.au/dds/

- Biodiversity status of pre-clearing and 2019 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
VMA	- *Vegetation Management Act 1999*

Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Lot: 4 Plan: KL210

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Important Note to User

Information presented in this report is based upon the Queensland Herbarium's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Resources website https://www.dnrme.qld.gov.au/

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

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Summary Information

The following table provides an overview of the AOI with respect to selected topographic and environmental themes. Refer to **Map 1** for locality information.

Table 1: Area of interest details: Lot: 4 Plan: KL210

Size (ha)	58,451.59
Local Government(s)	Isaac Regional
Bioregion(s)	Brigalow Belt, Central Queensland Coast
Subregion(s)	Isaac - Comet Downs, Nebo - Connors Ranges, Clarke - Connors Ranges
Catchment(s)	Fitzroy, Styx

The table below summarizes the extent of remnant vegetation classed as "Endangered", "Of concern" and "No concern at present" regional ecosystems classified by Biodiversity Status within the area of interest (AOI).

Table 2: Summary table, biodiversity status of regional ecosystems within the AOI

Biodiversity Status	Area (Ha)	% of AOI
Endangered	1,041.39	1.78
Of concern	5,102.22	8.73
No concern at present	25,123.56	42.98
Total remnant vegetation	31,267.17	53.49

Refer to **Map 2** for further information.

Regional Ecosystems

1. Introduction

Regional ecosystems are vegetation communities in a bioregion that are consistently associated with particular combinations of geology, landform and soil (Sattler and Williams 1999). Descriptions of Queensland's Regional ecosystems are available online from the Regional Ecosystem Description Database (REDD). Descriptions are compiled from a broad range of information sources including vegetation, land system and geology survey and mapping and detailed vegetation site data. The regional ecosystem classification and descriptions are reviewed as new information becomes available. A number of vegetation communities may form a single regional ecosystem and are usually distinguished by differences in dominant species, frequently in the shrub or ground layers and are denoted by a letter following the regional ecosystem code (e.g. a, b, c). Vegetation communities and regional ecosystems are amalgamated into a higher level classification of broad vegetation groups (BVGs).

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- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss*, or
- 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare** regional ecosystem subject to a threatening process.***

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.****

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

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***Rare regional ecosystem: pre-clearing extent (1000 ha); or patch size (100 ha and of limited total extent across its range).*

****Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

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Table 3: Remnant regional ecosystems, description and status within the AOI

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
11.12.1	Eucalyptus crebra woodland on igneous rocks	No concern at present	11,678.55	19.98
11.12.13	Eucalyptus crebra, Corymbia spp., E. acmenoides woodland on igneous rocks. Coastal hills	No concern at present	892.39	1.53
11.12.2	Eucalyptus melanophloia woodland on igneous rocks	No concern at present	9,436.20	16.14
11.12.21	Acacia harpophylla open forest on igneous rocks. Colluvial lower slopes	Endangered	52.44	0.09
11.12.4	Semi-evergreen vine thicket and microphyll vine forest on igneous rocks	No concern at present	259.91	0.44
11.12.6a	Corymbia citriodora open forest on igneous rocks (granite)	No concern at present	331.28	0.57
11.3.1	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Endangered	120.69	0.21
11.3.2	Eucalyptus populnea woodland on alluvial plains	Of concern	619.65	1.06
11.3.21	Dichanthium sericeum and/or Astrebla spp. grassland on alluvial plains. Cracking clay soils	Endangered	1.73	less than 0.01
11.3.25	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Of concern	1,775.38	3.04
11.3.27	Freshwater wetlands	Of concern	13.07	0.02
11.3.27b	Freshwater wetlands	Of concern	34.74	0.06
11.3.3	Eucalyptus coolabah woodland on alluvial plains	Of concern	683.57	1.17
11.3.3c	Eucalyptus coolabah woodland on alluvial plains	Of concern	15.45	0.03
11.3.4	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Of concern	1,267.13	2.17
11.3.7	Corymbia spp. open woodland on alluvial plains	Of concern	38.47	0.07
11.4.2	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Of concern	250.05	0.43
11.4.4	Dichanthium spp., Astrebla spp. grassland on Cainozoic clay plains	Of concern	1.46	less than 0.01
11.4.8	Eucalyptus cambageana woodland to open forest with Acacia harpophylla or A. argyrodendron on Cainozoic clay plains	Endangered	312.77	0.54
11.4.9	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Endangered	507.99	0.87

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
11.5.9c	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	No concern at present	122.59	0.21
11.7.1	Acacia harpophylla and/or Casuarina cristata and Eucalyptus thozetiana or E. microcarpa woodland on lower scarp slopes on Cainozoic lateritic duricrust	Of concern	254.51	0.44
11.8.11	Dichanthium sericeum grassland on Cainozoic igneous rocks	Of concern	21.26	0.04
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks	Of concern	8.45	0.01
11.8.4	Eucalyptus melanophloia woodland to open woodland on Cainozoic igneous rocks.	No concern at present	92.94	0.16
11.9.1	Acacia harpophylla-Eucalyptus cambageana woodland to open forest on fine-grained sedimentary rocks	Endangered	39.53	0.07
8.12.23	Eucalyptus moluccana woodland on elevated tablelands on Mesozoic to Proterozoic igneous rocks	Of concern	6.25	0.01
8.12.5a	Eucalyptus portuensis and/or Lophostemon confertus and/or E. exserta and/or Corymbia trachyphloia and/or E. fibrosa open forest on Mesozoic to Proterozoic igneous rocks	No concern at present	14.74	0.03
8.12.7a	Corymbia citriodora +/- Eucalyptus portuensis +/- E. drepanophylla (or E. crebra) open forest on hill slopes and undulating plateaus on Mesozoic to Proterozoic igneous rocks	No concern at present	1,438.24	2.46
8.12.7c	Corymbia citriodora +/- Eucalyptus portuensis +/- E. drepanophylla (or E. crebra) open forest on hill slopes and undulating plateaus on Mesozoic to Proterozoic igneous rocks	No concern at present	856.71	1.47
8.12.9	Eucalyptus tereticornis +/- Corymbia intermedia +/- Lophostemon suaveolens woodland on undulating uplands on Mesozoic to Proterozoic igneous rocks	Of concern	112.79	0.19
8.3.14	Ischaemum australe and/or Imperata cylindrica and/or Sorghum nitidum forma aristatum tussock grassland on drainage channels in gently undulating upland areas	Endangered	6.25	0.01
non-remnant	None	None	27,184.53	46.51

Refer to **Map 2** for further information. **Map 3** also provides a visual estimate of the distribution of regional ecosystems present before clearing.

Table 4 provides further information in regards to the remnant regional ecosystems present within the AOI. Specifically, the extent of remnant vegetation remaining within the bioregion, the 1:1,000,000 broad vegetation group (BVG) classification, whether the regional ecosystem is identified as a wetland, and extent of representation in Queensland's Protected Area Estate. For a description of the vegetation communities within the AOI and classified according to the 1:1,000,000 BVG, refer to **Table 6**.

Table 4: Remnant regional ecosystems within the AOI, additional information

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.12.1	Pre-clearing 1421000 ha; Remnant 2019 854000 ha	13c	None	Low

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.12.13	Pre-clearing 43000 ha; Remnant 2019 40000 ha	13c	None	High
11.12.2	Pre-clearing 470000 ha; Remnant 2019 190000 ha	17b	None	Low
11.12.21	Pre-clearing 72000 ha; Remnant 2019 6000 ha	25a	None	Low
11.12.4	Pre-clearing 98000 ha; Remnant 2019 55000 ha	7a	None	High
11.12.6a	Pre-clearing 230000 ha; Remnant 2019 154000 ha	10a	None	Low
11.3.1	Pre-clearing 780000 ha; Remnant 2019 77000 ha	25a	None	Low
11.3.2	Pre-clearing 1914000 ha; Remnant 2019 503000 ha	17a	Contains palustrine wetland (e.g. in swales).	Low
11.3.21	Pre-clearing 443000 ha; Remnant 2019 50000 ha	30a	Floodplain (other than floodplain wetlands).	Low
11.3.25	Pre-clearing 797000 ha; Remnant 2019 514000 ha	16a	Riverine wetland or fringing riverine wetland.	Low
11.3.27	Pre-clearing 58000 ha; Remnant 2019 42000 ha	34d	Palustrine or Lacustrine wetland (e.g. vegetated swamp or lake).	Low
11.3.27b	Pre-clearing 58000 ha; Remnant 2019 42000 ha	34d	Lacustrine wetland (e.g. lake).	Low
11.3.3	Pre-clearing 930000 ha; Remnant 2019 272000 ha	16c	Floodplain (other than floodplain wetlands).	Low
11.3.3c	Pre-clearing 930000 ha; Remnant 2019 272000 ha	16c	Palustrine wetland (e.g. vegetated swamp).	Low
11.3.4	Pre-clearing 684000 ha; Remnant 2019 180000 ha	16c	Floodplain (other than floodplain wetlands).	Low
11.3.7	Pre-clearing 139000 ha; Remnant 2019 61000 ha	9e	None	Low
11.4.2	Pre-clearing 196000 ha; Remnant 2019 34000 ha	17a	None	Low
11.4.4	Pre-clearing 71000 ha; Remnant 2019 27000 ha	30b	None	No representation
11.4.8	Pre-clearing 724000 ha; Remnant 2019 67000 ha	25a	Contains palustrine wetland (e.g. in swales).	Low
11.4.9	Pre-clearing 999000 ha; Remnant 2019 90000 ha	25a	Contains palustrine wetland (e.g. in swales).	Low
11.5.9c	Pre-clearing 366000 ha; Remnant 2019 239000 ha	18b	None	Low
11.7.1	Pre-clearing 196000 ha; Remnant 2019 76000 ha	25a	None	Low
11.8.11	Pre-clearing 602000 ha; Remnant 2019 170000 ha	30b	None	Low
11.8.3	Pre-clearing 81000 ha; Remnant 2019 25000 ha	7a	None	Low
11.8.4	Pre-clearing 217000 ha; Remnant 2019 151000 ha	11a	None	High

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.9.1	Pre-clearing 564000 ha; Remnant 2019 53000 ha	25a	None	Low
8.12.23	Pre-clearing 3000 ha; Remnant 2019 3000 ha	13d	None	High
8.12.5a	Pre-clearing 65000 ha; Remnant 2019 62000 ha	28e	None	Medium
8.12.7a	Pre-clearing 189000 ha; Remnant 2019 182000 ha	10b	None	High
8.12.7c	Pre-clearing 189000 ha; Remnant 2019 182000 ha	10b	None	High
8.12.9	Pre-clearing 30000 ha; Remnant 2019 20000 ha	9c	None	Low
8.3.14	Pre-clearing 1000 ha; Remnant 2019 800 ha	32a	Floodplain (other than floodplain wetlands).	Low
non-remnant	None	None	None	None

Representation in Protected Area Estate: High greater than 10% of pre-clearing extent is represented; Medium 4 - 10% is represented; Low less than 4% is represented, No representation.

The distribution of mapped wetland systems within the area of interest is displayed in **Map 6**.

The following table lists known special values associated with a regional ecosystem type.

Table 5: Remnant regional ecosystems within the AOI, special values

Regional Ecosystem	Special Values
11.12.1	Potential habitat for NCA listed species: Acacia islana, Capparis humistrata, Corymbia petalophylla, Cycas megacarpa, Cycas ophiolitica, Macrozamia crassifolia, Sannantha brachypoda, Solanum graniticum
11.12.13	Potential habitat for NCA listed species: Aristida granitica, Bertya sharpeana, Sannantha papillosa
11.12.2	Potential habitat for NCA listed species: Cycas ophiolitica, Sannantha brachypoda
11.12.21	Potential habitat for NCA listed species: Denhamia parvifolia
11.12.4	Potential habitat for NCA listed species: Backhousia oligantha, Brachychiton guymeri, Corchorus hygrophilus, Cossinia australiana, Croton magneticus, Graptophyllum excelsum, Hernandia bivalvis, Macropteranthes leiocaulis, Sannantha brachypoda, Solanum sporadotrichum
11.12.6a	Potential habitat for NCA listed species: Acacia tingoorensis, Callicarpa thozetii, Capparis humistrata, Cycas megacarpa, Cycas ophiolitica, Zieria actites
11.3.1	Habitat for threatened fauna species including painted honeyeater, Grantiella picta particularly in subregion 35 (Oliver et al. 2003).
11.3.2	Habitat for threatened flora species Homopholis belsonii. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus).

Regional Ecosystem	Special Values
11.3.21	Habitat for threatened flora species including Thesium australe, Picris evae, Dichanthium queenslandicum and the near threatened flora species Digitaria porrecta and fauna species including grassland earless dragon Tympanocryptis pinguicolla, five-clawed worm skink Anomalopus mackayi and grey snake Hemiaspis damelii.
11.3.25	Shown to be associated with a high fauna species richness in the Taroom area (Venz et al. 2002). Within parts of the Fitzroy catchment, this RE is known habitat for the threatened freshwater turtle Rheodytes leukops. Known to be important habitat for other riparian freshwater turtle species. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus).
11.3.27	Habitat for a diverse range of fauna species (Venz et al. 2002) particularly birds. 11.3.27a: Provides wetland habitat for a flora and fauna.
11.3.27b	Habitat for a diverse range of fauna species (Venz et al. 2002) particularly birds. 11.3.27a: Provides wetland habitat for a flora and fauna.
11.3.3	Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992, Venz et al. 2002). 11.3.3c: Mature trees provide hollows for fauna especially nesting birds. Associated with a high number of fauna species (Dick 1992, Venz et al. 2002).
11.3.3c	Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992, Venz et al. 2002). 11.3.3c: Mature trees provide hollows for fauna especially nesting birds. Associated with a high number of fauna species (Dick 1992, Venz et al. 2002).
11.3.4	Potential habitat for NCA listed species: Acacia pedleyi, Callicarpa thozetii, Cycas megacarpa, Cycas ophiolitica, Digitaria porrecta, Eriocaulon carsonii subsp. orientale, Livistona nitida, Rhaponticum australe, Samadera bidwillii, Sannantha brachypoda. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus).
11.3.7	Habitat of the endangered northern hairy-nosed wombat, Lasiorhinus krefftii.
11.4.2	Potential habitat for NCA listed species: Solanum adenophorum
11.4.4	Habitat for threatened plant species including Dichanthium queenslandicum. Often occurs adjacent to lower lying areas dominated by regional ecosystems 11.4.11 and 11.3.3.
11.4.8	Larger gilgai provides ephemeral wetland habitat.
11.4.9	Potential habitat for NCA listed species: Cadellia pentastylis, Solanum adenophorum, Solanum dissectum, Solanum elachophyllum, Solanum johnsonianum, Xerothamnella herbacea
11.5.9c	Potential habitat for NCA listed species: Cerbera dumicola, Cossinia australiana, Cycas ophiolitica, Solanum elachophyllum
11.7.1	Habitat for threatened plant species including Cadellia pentastylis.
11.8.11	Habitat for threatened plant species including Trioncinia retroflexa and Dichanthium queenslandicum. T. retroflexa is currently known from three small populations.
11.8.3	Habitat for threatened plant species Croton magneticus.

Regional Ecosystem	Special Values
11.8.4	Potential habitat for NCA listed species: Acacia arbiana, Acacia islana, Bertya pedicellata, Grevillea hockingsii, Haloragis exalata subsp. velutina, Marsdenia brevifolia, Sannantha brachypoda. This ecosystem is also known to provide suitable habitat for koalas (Phascolarctos cinereus).
11.9.1	Potential habitat for NCA listed species: Solanum adenophorum, Solanum dissectum, Solanum elachophyllum, Solanum johnsonianum, Xerothamnella herbacea
8.12.23	Habitat for some species which are uncommon in the bioregion and are outliers from more southern or high altitude areas including Polygala japonica, Dichelachne micrantha, Hardenbergia violacea, Microlaena stipoides, Ranunculus lappaceus and Veronica plebeia. Important as habitat for Eucalyptus moluccana which is relatively uncommon in the bioregion. The Eungella Honeyeater, (listed as "Near Threatened" in the Queensland Nature Conservation Act 1992), feeds in this ecosystem (targeting E. moluccana) for a few weeks of the year before nesting. Also Koala habitat.
8.12.5a	Potential habitat for NCA listed species: Grevillea venusta, Ozothamnus eriocephalus, Parsonsia larcomensis 8.12.5a: Habitat for the threatened species Ozothamnus eriocephalus and the Glossy Black Cockatoo which are all listed in the Queensland Nature Conservation Act 1992. Habitat for a number of plant species restricted to the narrow, high-altitude zone on the Clarke Range, which otherwise only occur in south-eastern Queensland and high altitudes of the Wet Tropics. These include Acacia falcata, Acacia fimbriata and Melichrus adpressus, as well as other species poorly known in the Central Queensland Coast such as Aristida vagans, Acacia penninervis, Banksia spinulosa, Monotoca scoparia and Tephrosia rufula. Acacia fimbriata is uncommon in northern parts of the bioregion. 8.12.5b: Habitat for the NCA listed plant species Parsonsia larcomensis, Comesperma oblongatum and Grevillea venusta. Habitat for plant species rarely recorded/poorly known in the bioregion including Acacia falcata, A. leiocalyx subsp. leiocalyx, A. penninervis var. penninervis, Brachychiton bidwillii, Eucalyptus suffulgens, Melaleuca hemisticta, Daviesia umbellulata, Monotoca scoparia, Banksia spinulosa, Comesperma oblongatum, Dodonaea triquetra, Persoonia amaliae, Hibiscus splendens, Ricinocarpos ledifolius, Hibbertia velutina, Gompholobium pinnatum, Gymnostachys anceps, Schizaea bifida, Centratherum riparium, Chorizema parviflorum, Corybas barbarae, Dipodium variegatum, Dockrillia bowmanii, Solanum stelligerum and Hovea longipes. Northern limit of Astrotricha intermedia, Macrozamia miquelii, Bowenia serrulata, Phylotheca difformis subsp. smithiana, Comesperma esulifolium, Hovea clavata, Pomaderris ferruginea, Hibbertia vestita, Patersonia sericea and Schoenus vaginatus.

Regional Ecosystem	Special Values
8.12.7a	Potential habitat for NCA listed species: Callicarpa thozetii, Ozothamnus eriocephalus, Coleus eungellaensis 8.12.7a: Habitat for endangered plant species Callicarpa thozetii. Potential habitat for the vulnerable plant species Ozothamnus eriocephalus. Habitat for a number of species restricted to the narrow, high-altitude zone on the Clarke Range, which otherwise only occur in SE Queensland and high altitudes of the Wet Tropics. These include Hardenbergia violacea and Desmodium varians. Also habitat for some other species poorly known in the Central Queensland Coast bioregion such as Opercularia diphylla, Persoonia amaliae, Goodenia rotundifolia and Tephrosia purpurea var. sericea. Habitat for arboreal mammals including Yellow Bellied Gliders and Koalas. 8.12.7b: Habitat for species poorly known in the CQC bioregion such as Brachychiton bidwillii. 8.12.7c: Habitat for a number of species restricted to the narrow, high-altitude zone on the Clarke Range, which otherwise only occur in south-eastern Queensland and high altitudes of the Wet Tropics. These include Hardenbergia violacea and Desmodium varians. Also habitat for some other species poorly known in the Central Queensland Coast bioregion such as Opercularia diphylla and Persoonia amaliae.
8.12.7c	Potential habitat for NCA listed species: Callicarpa thozetii, Ozothamnus eriocephalus, Coleus eungellaensis 8.12.7a: Habitat for endangered plant species Callicarpa thozetii. Potential habitat for the vulnerable plant species Ozothamnus eriocephalus. Habitat for a number of species restricted to the narrow, high-altitude zone on the Clarke Range, which otherwise only occur in SE Queensland and high altitudes of the Wet Tropics. These include Hardenbergia violacea and Desmodium varians. Also habitat for some other species poorly known in the Central Queensland Coast bioregion such as Opercularia diphylla, Persoonia amaliae, Goodenia rotundifolia and Tephrosia purpurea var. sericea. Habitat for arboreal mammals including Yellow Bellied Gliders and Koalas. 8.12.7b: Habitat for species poorly known in the CQC bioregion such as Brachychiton bidwillii. 8.12.7c: Habitat for a number of species restricted to the narrow, high-altitude zone on the Clarke Range, which otherwise only occur in south-eastern Queensland and high altitudes of the Wet Tropics. These include Hardenbergia violacea and Desmodium varians. Also habitat for some other species poorly known in the Central Queensland Coast bioregion such as Opercularia diphylla and Persoonia amaliae.
8.12.9	Important habitat for arboreal mammals and Powerful Owl, Rufus Owl, Glossy Black Cockatoo. Currently known to contain a number of herbaceous species that are locally rare (restricted to the higher altitudes and are more typical of southern cooler climates). This includes Carex inversa (northern limit), Dichondra repens, Desmodium gunnii, Mentha diemenica, Plantago debilis, Veronica plebeia, Viola betonicifolia subsp. betonicifolia (northern limit), Brachyscome paludicola (northern limit), Desmodium varians, Dichelachne montana (northern limit), Hardenbergia violacea, Microlaena stipoides, Poa labillardierei var. labillardierei and Ranunculus lappaceus. Habitat for several other species poorly known from the Central Qld Coast bioregion, including Cyperus leiocaulon, Eremophila debilis, Haloragis aspera and Hyparrhenia filipendula.

Regional Ecosystem	Special Values
8.3.14	Habitat for several herbaceous species which are poorly known in the Central Queensland Coast bioregion, including Brachyscome paludicola (here at the northern limit of its range), Ranunculus lappaceus, and sedge species such as Eleocharis cylindrostachys. Important habitat for frogs. A Pseudophryne species may prove to be restricted to this RE, or this and other similar regional ecosystems (e.g. 8.12.9) in the bioregion. Important habitat for Swamp Rat.
non-remnant	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

BVGs are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid climatic zones. BVGs provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states. There are three levels of BVGs which reflect the approximate scale at which they are designed to be used: the 1:5,000,000 (national), 1:2,000,000 (state) and 1:1,000,000 (regional) scales.

A comprehensive description of BVGs is available at:

https://publications.qld.gov.au/dataset/redd/resource/

The following table provides a description of the 1:1,000,000 BVGs present and their associated extent within the AOI.

Table 6: Broad vegetation groups (1 million) within the AOI

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	27,184.53	46.51
10a	Dry woodlands to open woodlands dominated by Corymbia citriodora (spotted gum). (land zones 10, 7, 12, 11,[8]) (BRB, NET, [DEU])	331.28	0.57
10b	Moist open forests to woodlands dominated by Corymbia citriodora (spotted gum). (land zones 12, 11, 9, 5, 8) (SEQ, CQC, EIU, WET)	2,294.95	3.93
11a	Moist to dry open forests to woodlands dominated by Eucalyptus orgadophila (mountain coolibah). Some areas dominated by E. tereticornis (blue gum), E. melliodora (yellow box), E. albens (white box), E. crebra (narrow-leaved red ironbark) or E. melanophloia (silver-leaved ironbark). (land zones 8, 11, 4, [3]) (BRB, SEQ, EIU)	92.94	0.16
13c	Woodlands of Eucalyptus crebra (sens. lat.) (narrow-leaved red ironbark), E. drepanophylla (grey ironbark), E. fibrosa (dusky-leaved ironbark), E. shirleyi (shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, [5]) (BRB, EIU, SEQ, NET, CQC)	12,570.95	21.51
13d	Woodlands dominated by Eucalyptus moluccana (gum-topped box) (or E. microcarpa (inland grey box)) on a range of substrates. (land zone 5, 9, 3, 11, 12) (BRB, SEQ, EIU, CQC, [NET, WET])	6.25	0.01

BVG (1 Million)	Description	Area (Ha)	% of AOI
16a	Open forest and woodlands dominated by Eucalyptus camaldulensis (river red gum) (or E. tereticornis (blue gum)) and/or E. coolabah (coolabah) (or E. microtheca (coolabah)) fringing drainage lines. Associated species may include Melaleuca spp., Corymbia tessellaris (carbeen), Angophora spp., Casuarina cunninghamiana (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, EIU, NWH, SEQ, [NET, WET]) (All bioregions except CYP and CQC)	1,775.38	3.04
16c	Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	1,966.16	3.36
17a	Woodlands dominated by Eucalyptus populnea (poplar box) (or E. brownii (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges. (land zones 3, 5, 10, 9, 4, 11, 12, [8]) (BRB, MUL, DEU, MUL, EIU)	869.71	1.49
17b	Woodlands to open woodlands dominated by Eucalyptus melanophloia (silver-leaved ironbark) (or E. shirleyi (shirley's silver-leaved ironbark)) on sand plains and footslopes of hills and ranges. (land zones 5, 12, 3, 11, 9, 7) (BRB, DEU, EIU, SEQ, NET, GUP, NWH)	9,436.20	16.14
18b	Woodlands dominated Eucalyptus crebra (sens. lat.) (narrow-leaved red ironbark) frequently with Corymbia spp. or Callitris spp. on flat to undulating plains. (land zones 5, 3) (BRB, DEU, EIU, GUP, CYP)	122.59	0.21
25a	Open forests to woodlands dominated by Acacia harpophylla (brigalow) sometimes with Casuarina cristata (belah) on heavy clay soils. Includes areas co-dominated with A. cambagei (gidgee) and/or emergent eucalypts (land zones 4, 9, 3, 11, 7, 12, [5, 8]) (BRB, MUL, MGD, DEU, [SEQ])	1,287.93	2.2
28e	Low open forest to woodlands dominated by Lophostemon suaveolens (swamp box) (or L. confertus (brush box)) or Syncarpia glomulifera (turpentine) frequently with Allocasuarina spp. on rocky hill slopes. (land zones 12, 9, 3, 11, [10, 8]) (CQC, WET, SEQ, BRB, [CYP])	14.74	0.03
30a	Tussock grasslands dominated by Astrebla spp. (mitchell grass) or Dichanthium spp. (bluegrass) often with Eulalia aurea (silky browntop) on alluvia. (land zones 3, 4) (MGD, GUP, BRB, MUL, [DEU])	1.73	less than 0.01
30b	Tussock grasslands dominated by Astrebla spp. (mitchell grass) or Dichanthium spp. (bluegrass) often with Iseilema spp. on undulating downs or clay plains. (land zones 9, 3, 4, 8, [5]) (MGD, CHC, GUP, BRB, [EIU, DEU, NWH])	22.72	0.04
32a	Closed tussock grasslands dominated by Themeda arguens, Dichanthium sericeum (Queensland bluegrass) or Panicum spp., Eriachne spp., Fimbristylis spp., Aristida spp. or Imperata cylindrica (blady grass) on marine and alluvial plains. (land zones 3, [5]) (GUP, CYP, [BRB,EIU, WET, CQC])	6.25	0.01
34d	Palustrine wetlands. Freshwater swamps/springs/billabongs on floodplains ranging from permanent and semi-permanent to ephemeral. (land zone 3) (GUP, EIU, BRB, CYP, CHC, [MGD])	47.81	0.08

BVG (1 Million)	Description	Area (Ha)	% of AOI
7a	Semi-evergreen vine thickets on wide range of substrates. (land zones 8, 9, 11, 12, 5, 4, 3, 10, [7]) (BRB, EIU, SEQ, CQC, [WET, GUP]) (Tracey 1982 11)	268.35	0.46
9c	Open forests of Corymbia clarksoniana (grey bloodwood) (or C. intermedia (pink bloodwood) or C. novoguinensis), C. tessellaris (carbeen) +/- Eucalyptus tereticornis (blue gum) predominantly on coastal ranges. Other frequent tree species include Eucalyptus drepanophylla (grey ironbark), E. pellita (large-fruited red mahogany), E. brassiana (Cape York red gum) and Lophostemon suaveolens (swamp box). (land zones 12, 11, 8, 5). (WET, CQC, CYP, BRB)	112.79	0.19
9e	Open forests, woodlands and open woodlands dominated by Corymbia clarksoniana (grey bloodwood) (or C. novoguinensis or C. intermedia (pink bloodwood) or C. polycarpa (long-fruited bloodwood)) frequently with Erythrophleum chlorostachys (red ironwood) or Eucalyptus platyphylla (poplar gum) predominantly on coastal sandplains and alluvia. (land zones 3, 5, 2) (CYP, BRB, CQC, WET, EIU)	38.47	0.07

Refer to **Map 4** for further information. **Map 5** also provides a representation of the distribution of vegetation communities as per the 1:5,000,000 BVG believed to be present prior to European settlement.

4. Technical and BioCondition Benchmark Descriptions

Technical descriptions provide a detailed description of the full range in structure and floristic composition of regional ecosystems (e.g. 11.3.1) and their component vegetation communities (e.g. 11.3.1a, 11.3.1b). See:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

The descriptions are compiled using site survey data from the Queensland Herbarium's CORVEG database. Distribution maps, representative images (if available) and the pre-clearing and remnant extent (hectares) of each vegetation community derived from the regional ecosystem mapping data are included. The technical descriptions should be used in conjunction with the fields from the regional ecosystem description database (REDD) for a full description of the regional ecosystem.

Technical descriptions include data on canopy height, canopy cover and native plant species composition of the predominant layer, which are attributes relevant to assessment of the remnant status of vegetation under the *Vegetation Management Act 1999*. However, as technical descriptions reflect the full range in structure and floristic composition across the climatic, natural disturbance and geographic range of the regional ecosystem, local reference sites should be used for remnant assessment where possible (Neldner et al. 2020 (PDF)* section 3.3 of:

https://publications.qld.gov.au/dataset/redd/resource/

The technical descriptions are subject to review and are updated as additional data becomes available.

When conducting a BioCondition assessment, these technical descriptions should be used in conjunction with BioCondition benchmarks for the specific regional ecosystem, or component vegetation community.

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

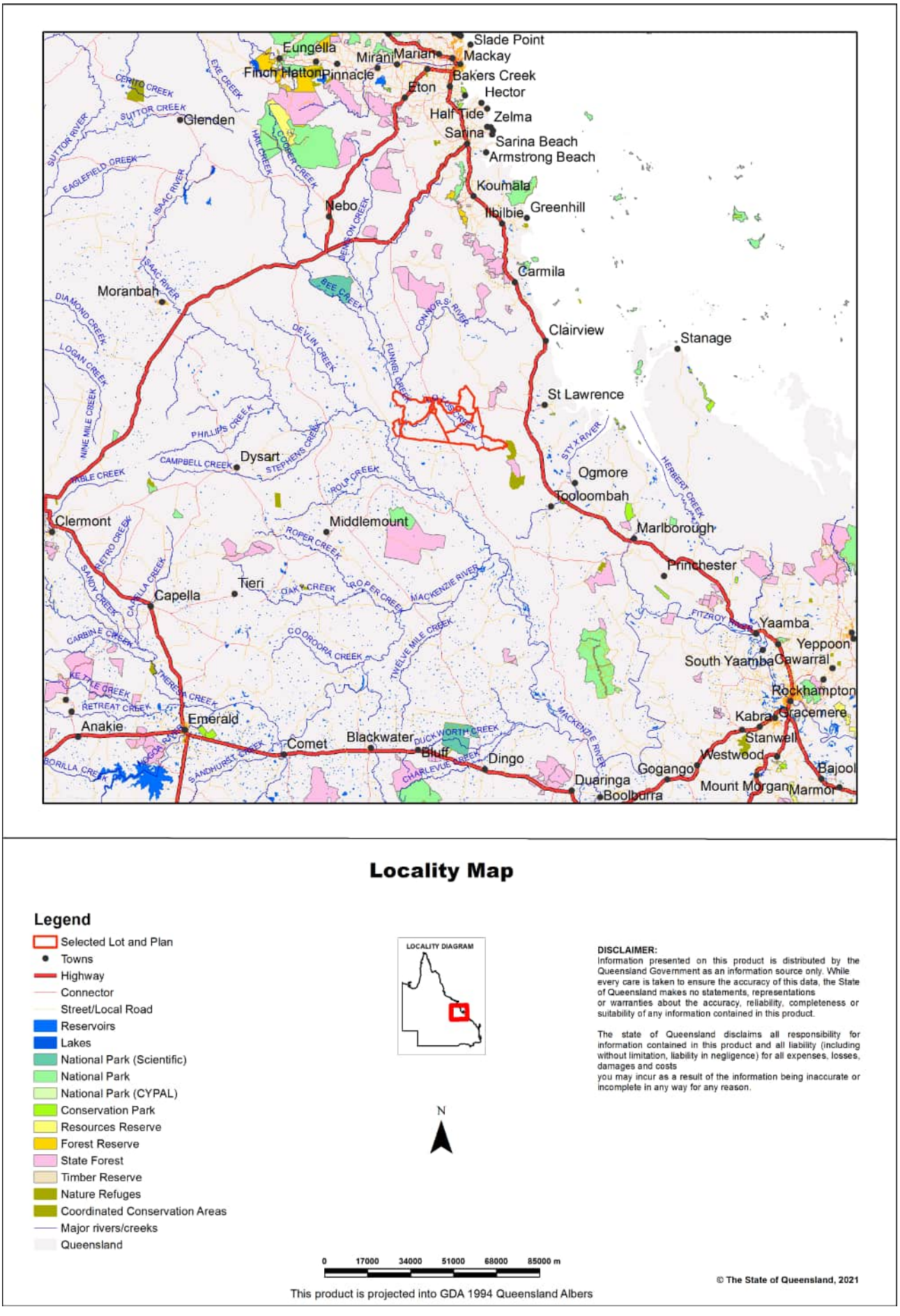
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance regimes has been considered throughout the geographic extent of the regional ecosystem. Local reference sites should be used for this spatial and temporal (seasonal and annual) variability.

Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

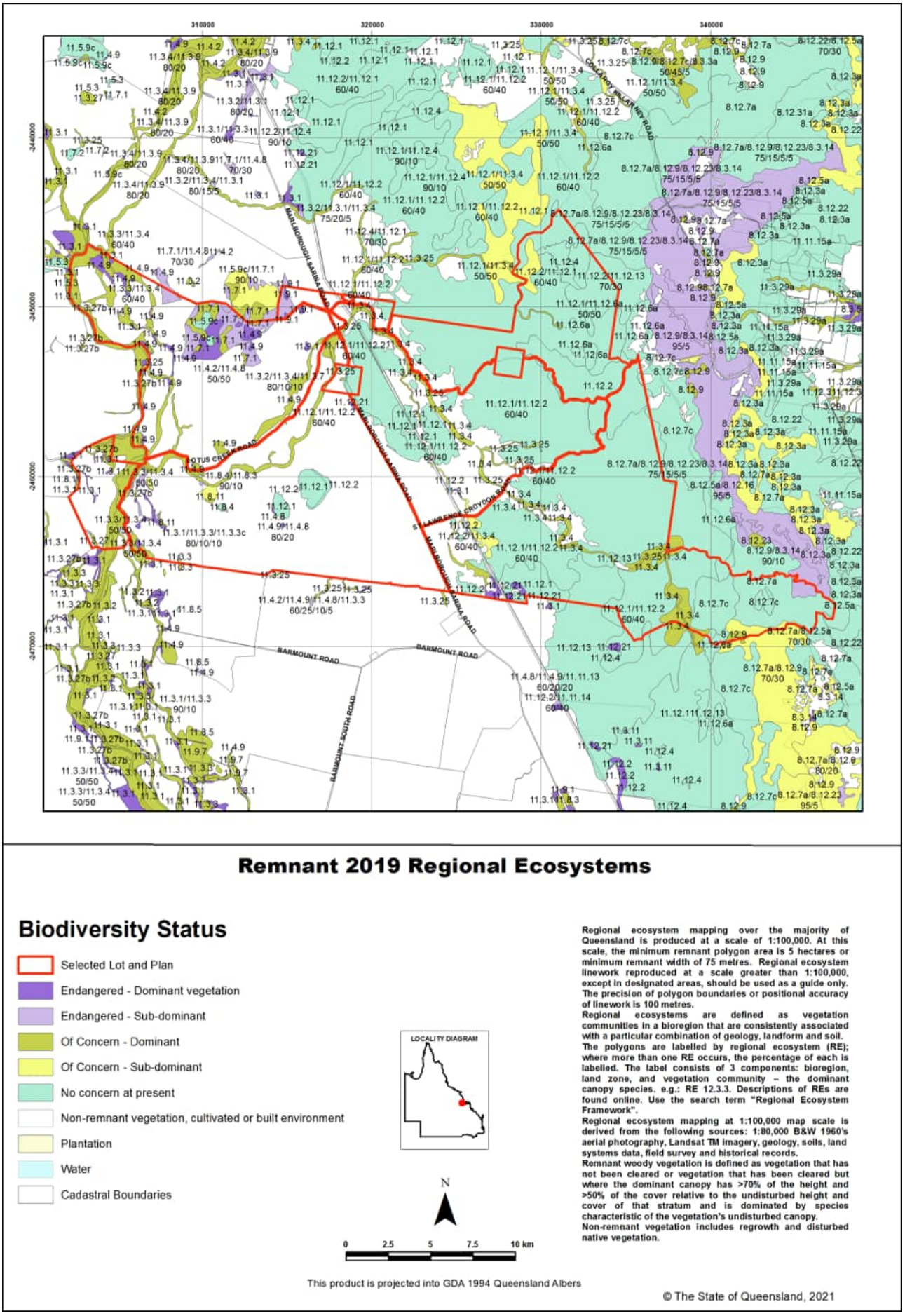
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.12.1	Available	Available
11.12.13	Available	Not currently available
11.12.2	Available	Available
11.12.21	Available	Available
11.12.4	Available	Available
11.12.6a	Available	Not currently available
11.3.1	Available	Available
11.3.2	Available	Available
11.3.21	Not currently available	Available
11.3.25	Available	Available
11.3.27	Available	Not currently available
11.3.27b	Available	Not currently available
11.3.3	Available	Available
11.3.3c	Available	Not currently available
11.3.4	Available	Available
11.3.7	Available	Available
11.4.2	Available	Available
11.4.4	Available	Available
11.4.8	Available	Available
11.4.9	Available	Available
11.5.9c	Available	Not currently available
11.7.1	Available	Available
11.8.11	Available	Available
11.8.3	Available	Available
11.8.4	Available	Available
11.9.1	Available	Available
8.12.23	Available	Not currently available
8.12.5a	Available	Not currently available
8.12.7a	Available	Not currently available
8.12.7c	Available	Not currently available
8.12.9	Available	Not currently available
8.3.14	Available	Not currently available
non-remnant	Not currently available	Not currently available

Maps

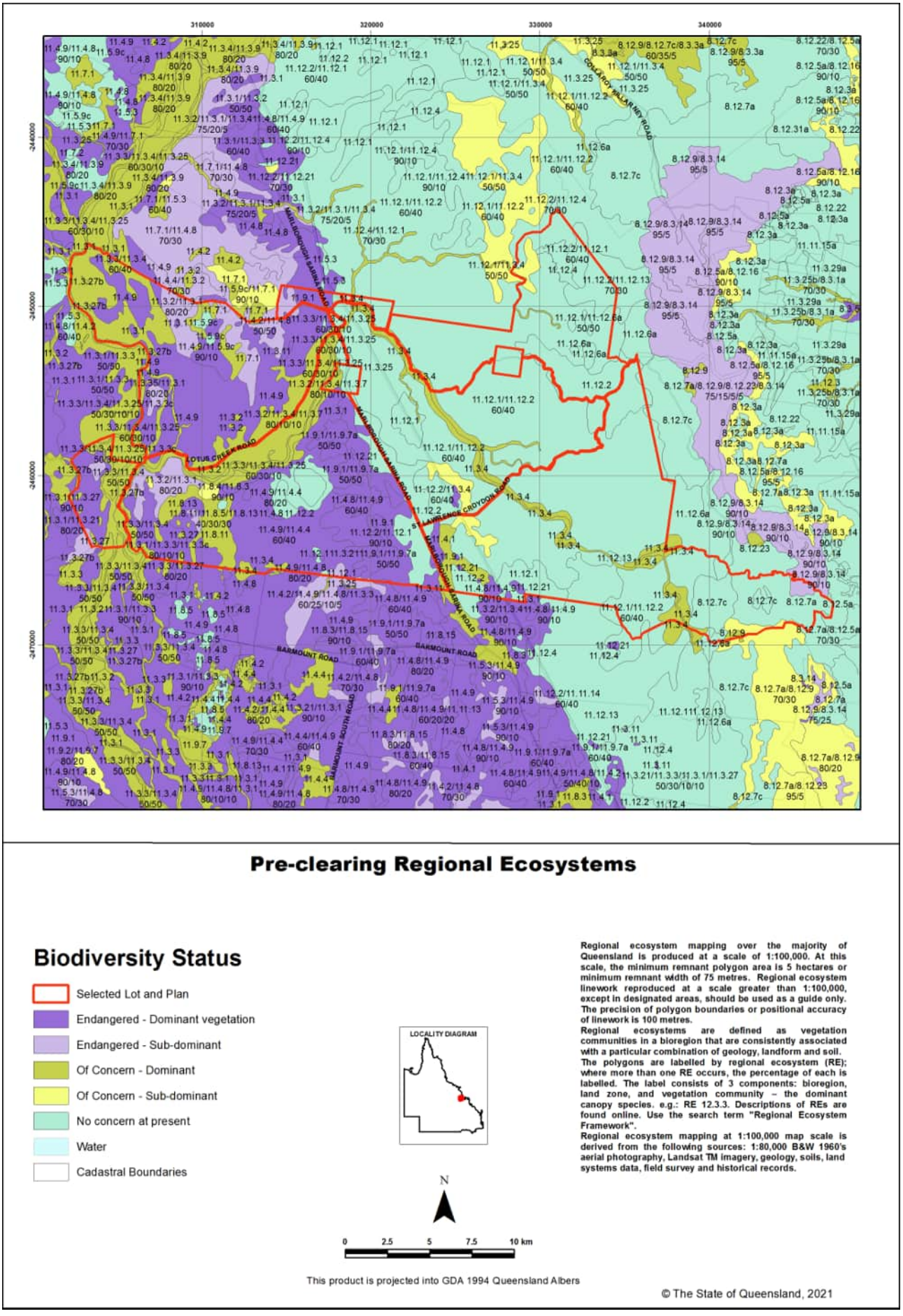
Map 1 - Location



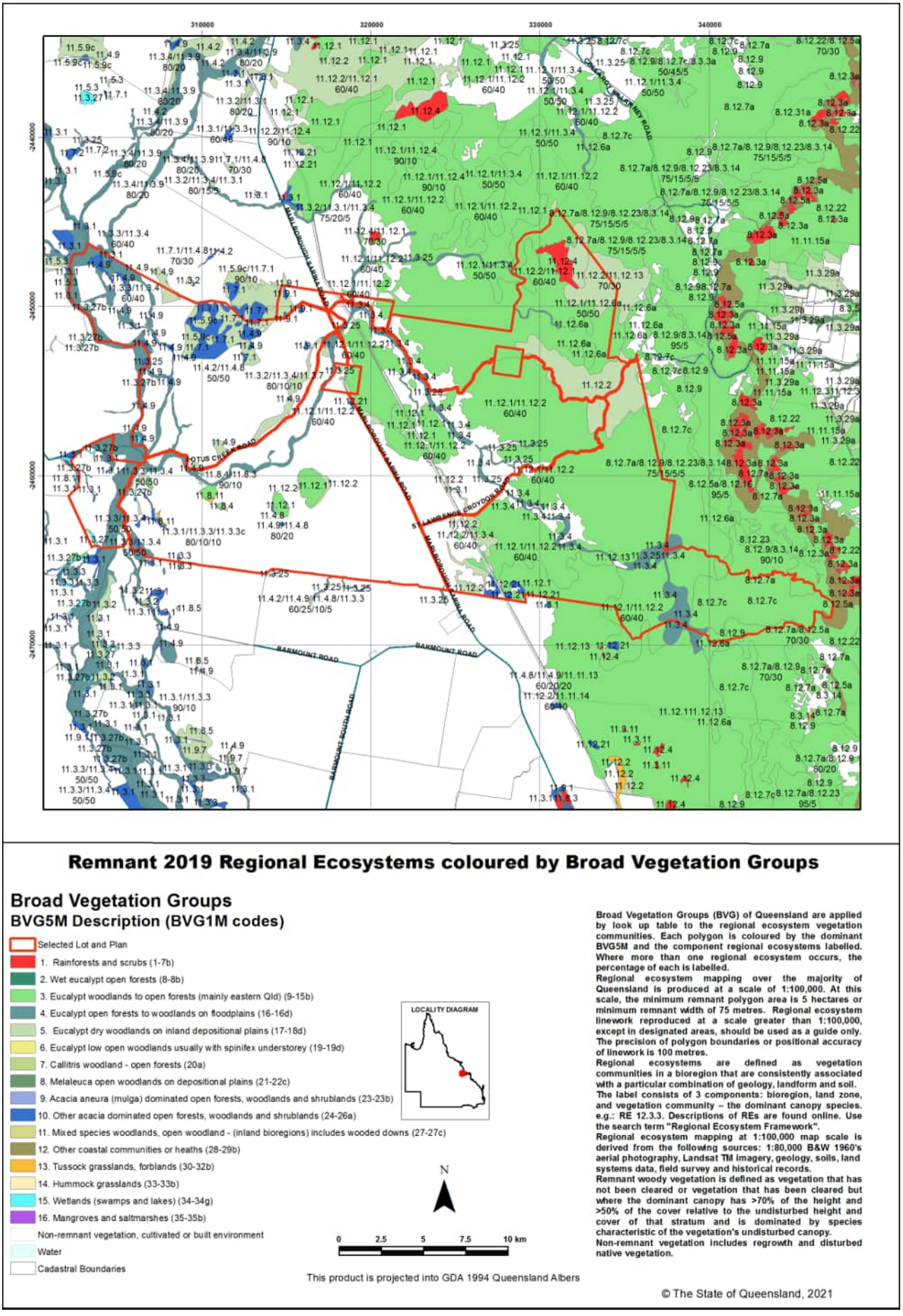
Map 2 - Remnant 2019 regional ecosystems



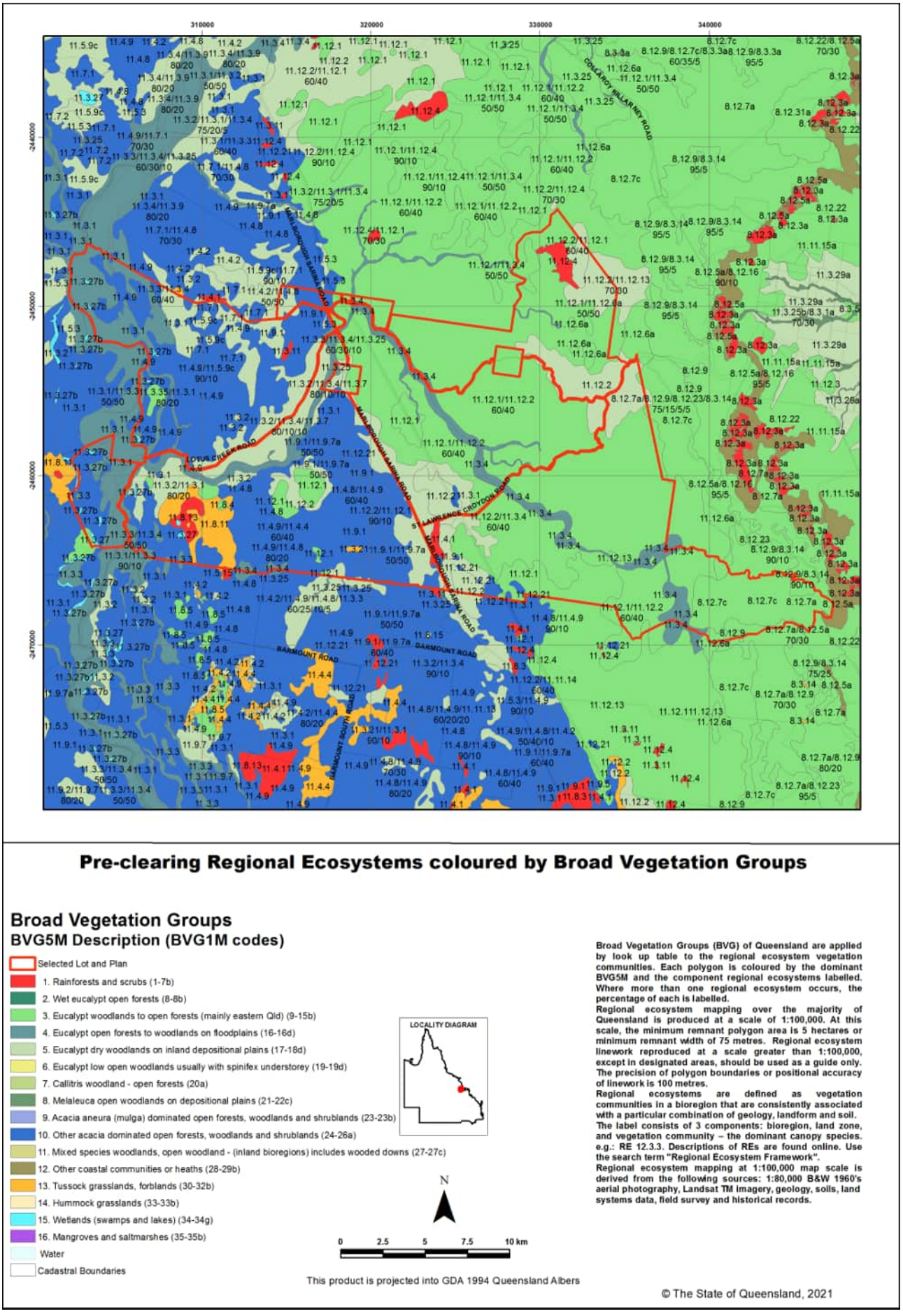
Map 3 - Pre-clearing regional ecosystems



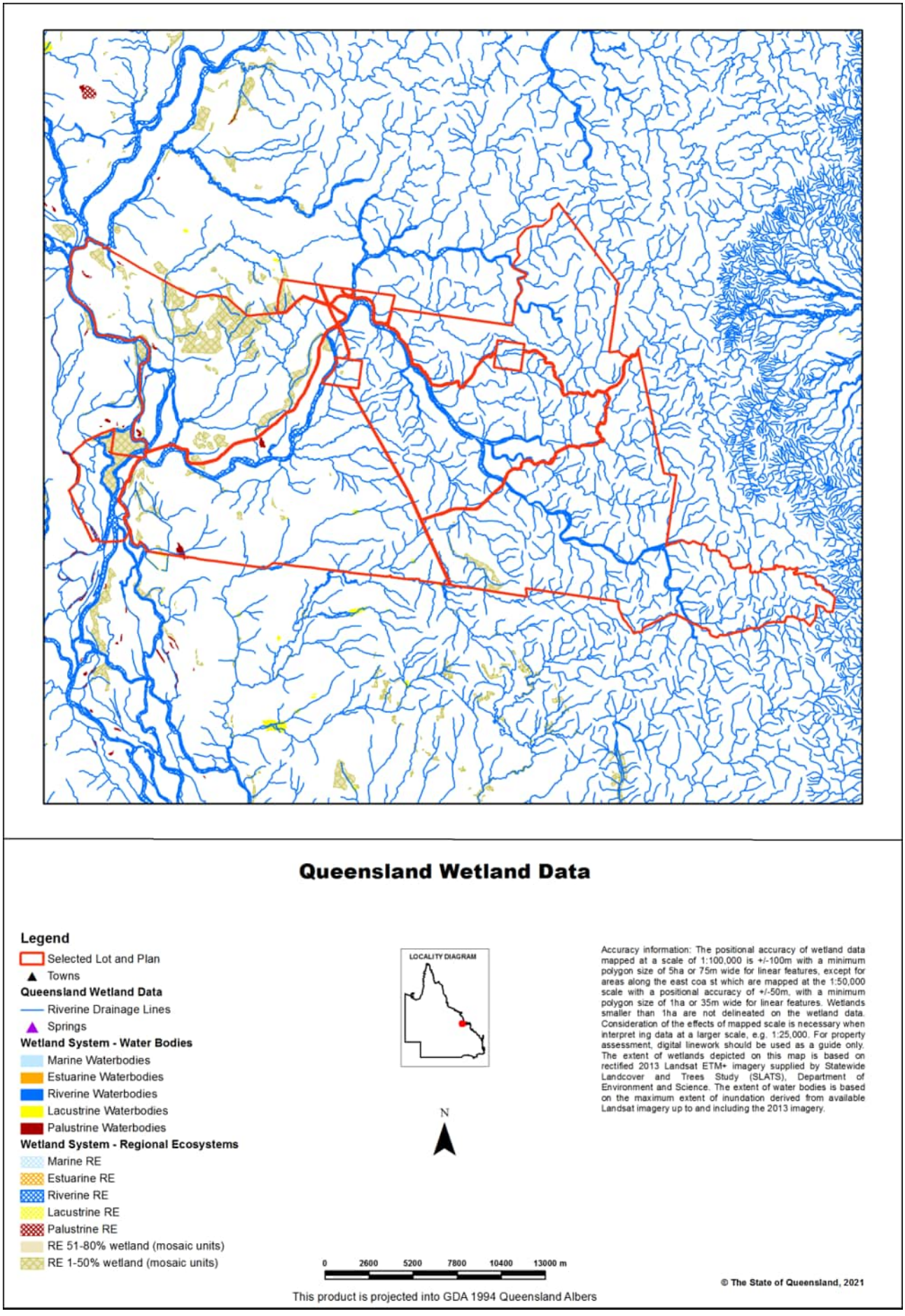
Map 4 - Remnant 2019 regional ecosystems by BVG (5M)



Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of Environment and Science's Website -

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

provides further information on the regional ecosystem framework, including access to links to the Regional Ecosystem Database, Broad Vegetation Group Definitions, Regional Ecosystem and Land zone descriptions.

Descriptions of the broad vegetation groups of Queensland can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

The methodology for mapping regional ecosystems can be downloaded from:

https://publications.qld.gov.au/dataset/redd/resource/

Technical descriptions for regional ecosystems can be obtained from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/technical-descriptions/

Benchmarks can be obtained from:

http://www.qld.gov.au/environment/plants-animals/biodiversity/benchmarks/

For further information associated with the remnant regional ecosystem dataset used by this report, refer to the metadata associated with the Biodiversity status of pre-clearing and Remnant Regional Ecosystems of Queensland dataset (version listed in **Appendix 1**) which is available through the Queensland Government Information System portal,

http://dds.information.qld.gov.au/dds/

The Queensland Globe is a mapping and data application. As an interactive online tool, Queensland Globe allows you to view and explore Queensland maps, imagery (including up-to-date satellite images) and other spatial data, including regional ecosystem mapping. To further view and explore regional ecosystems over an area of interest, access the Biota Globe (a component of the Queensland Globe). The Queensland Globe can be accessed via the following link:

http://www.dnrm.qld.gov.au/mapping-data/queensland-globe

References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2019). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 4.0. Queensland Herbarium, Department of Environment and Science.

(https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2020). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 5.1. Updated March 2020. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

(https://publications.qld.gov.au/dataset/redd/resource/6dee78ab-c12c-4692-9842-b7257c2511e4)

Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

http://www.qld.gov.au/environment/plants-animals/plants/ecosystems/download/

- Regional Ecosystem Description Database

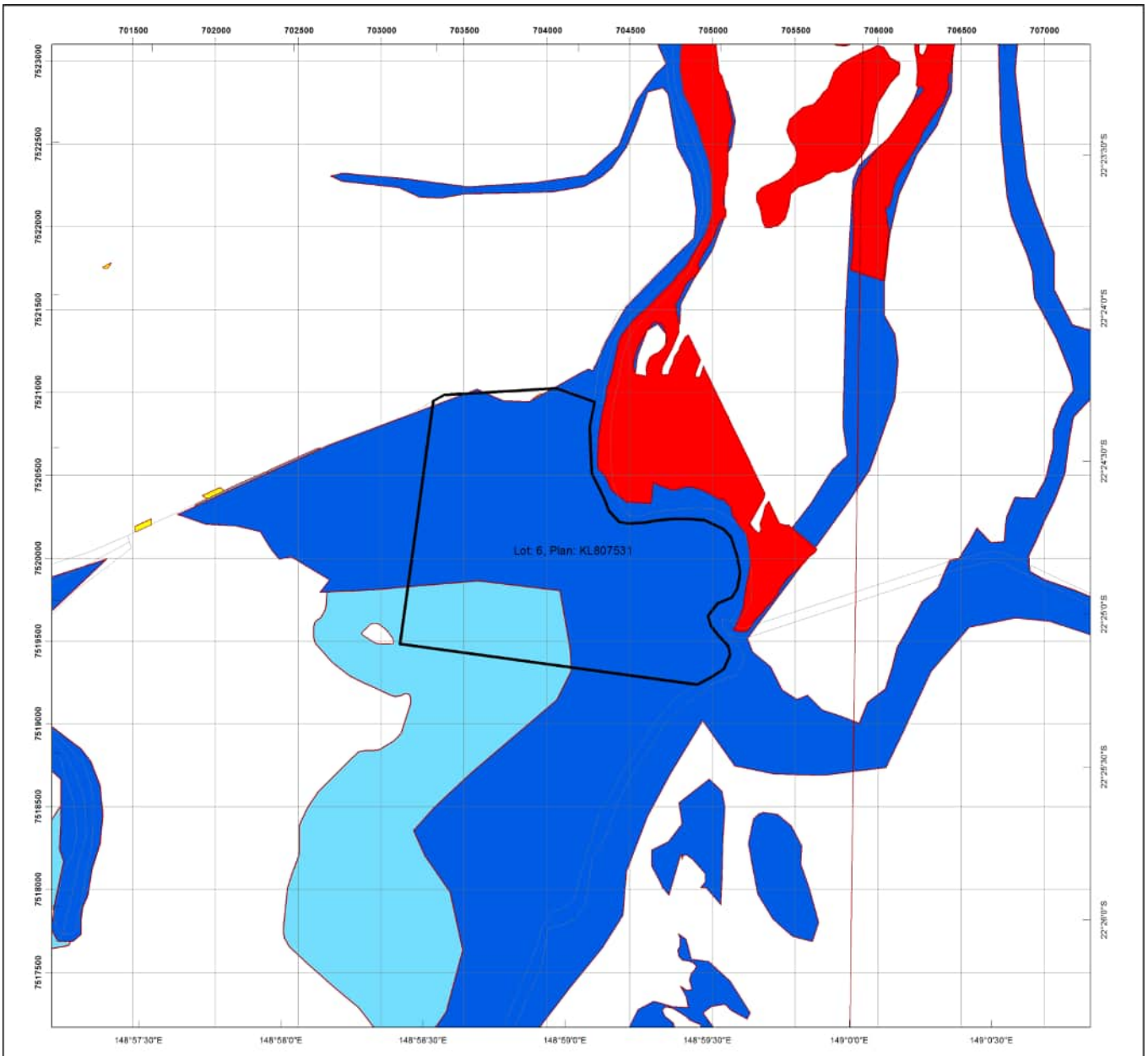
The datasets listed below are available for download from:

http://dds.information.qld.gov.au/dds/

- Biodiversity status of pre-clearing and 2019 remnant regional ecosystems of Queensland
- Pre-clearing Vegetation Communities and Regional Ecosystems of Queensland
- Queensland Wetland Data Version - Wetland lines
- Queensland Wetland Data Version - Wetland points
- Queensland Wetland Data Version - Wetland areas

Appendix 2 - Acronyms and Abbreviations

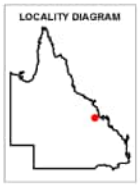
AOI	- Area of Interest
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
VMA	- *Vegetation Management Act 1999*



Regulated Vegetation Management Map

Legend

- Selected Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Other land parcel boundaries



N

0 340 680 1,020 1,360 1,700 m

This product is projected into:
GDA 1994 MGA Zone 55

Disclaimer:
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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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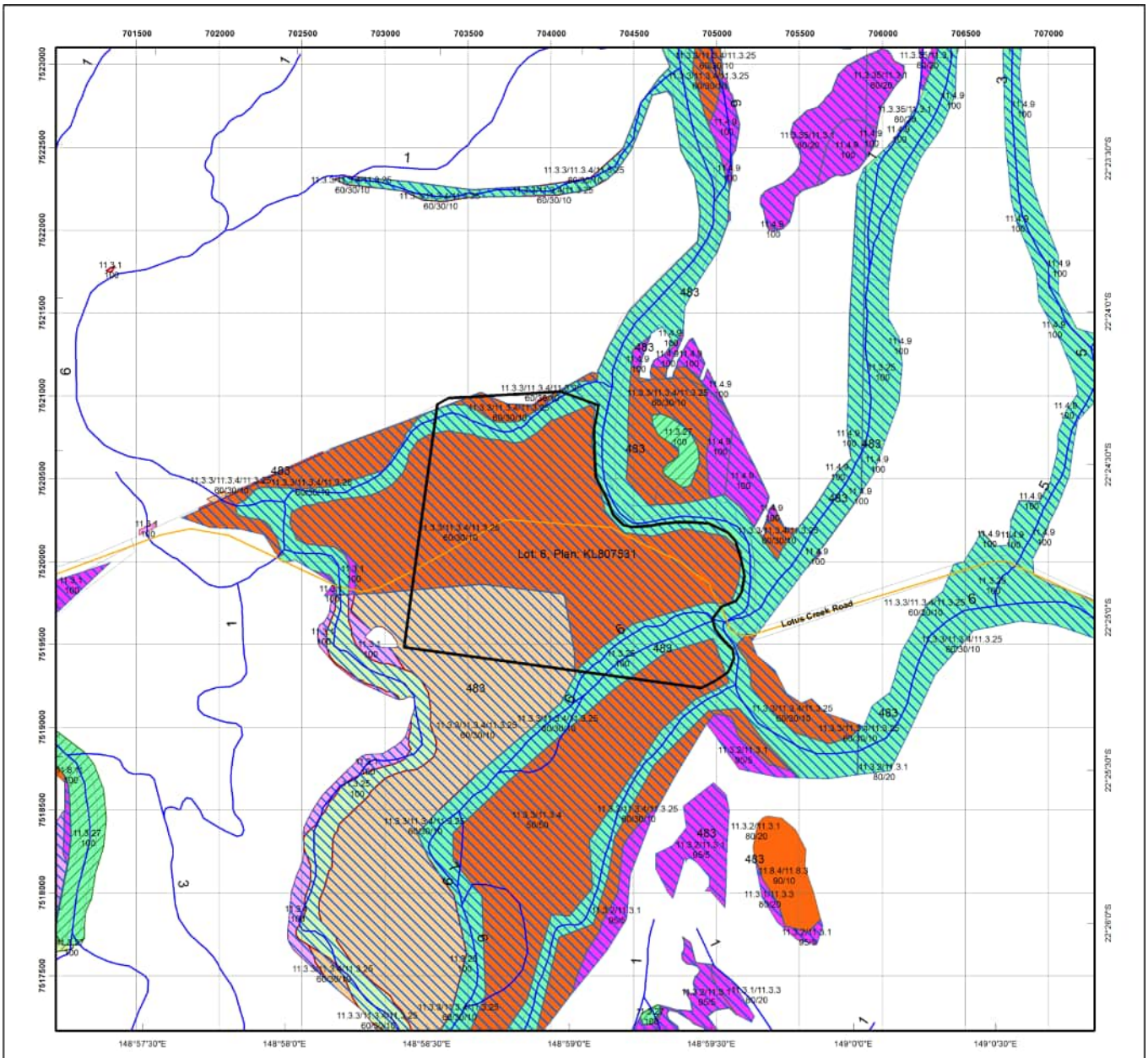
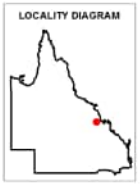


Vegetation Management Supporting Map

Legend

- Selected Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area under Section 20AH
  These areas are edged in yellow and filled with the remnant RE Status
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category C area under Section 20AI
  These areas are edged in purple and filled with the remnant RE Status
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map
  (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries

LOCALITY DIAGRAM



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This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Resources website (http://www.dnrme.qld.gov.au) has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or

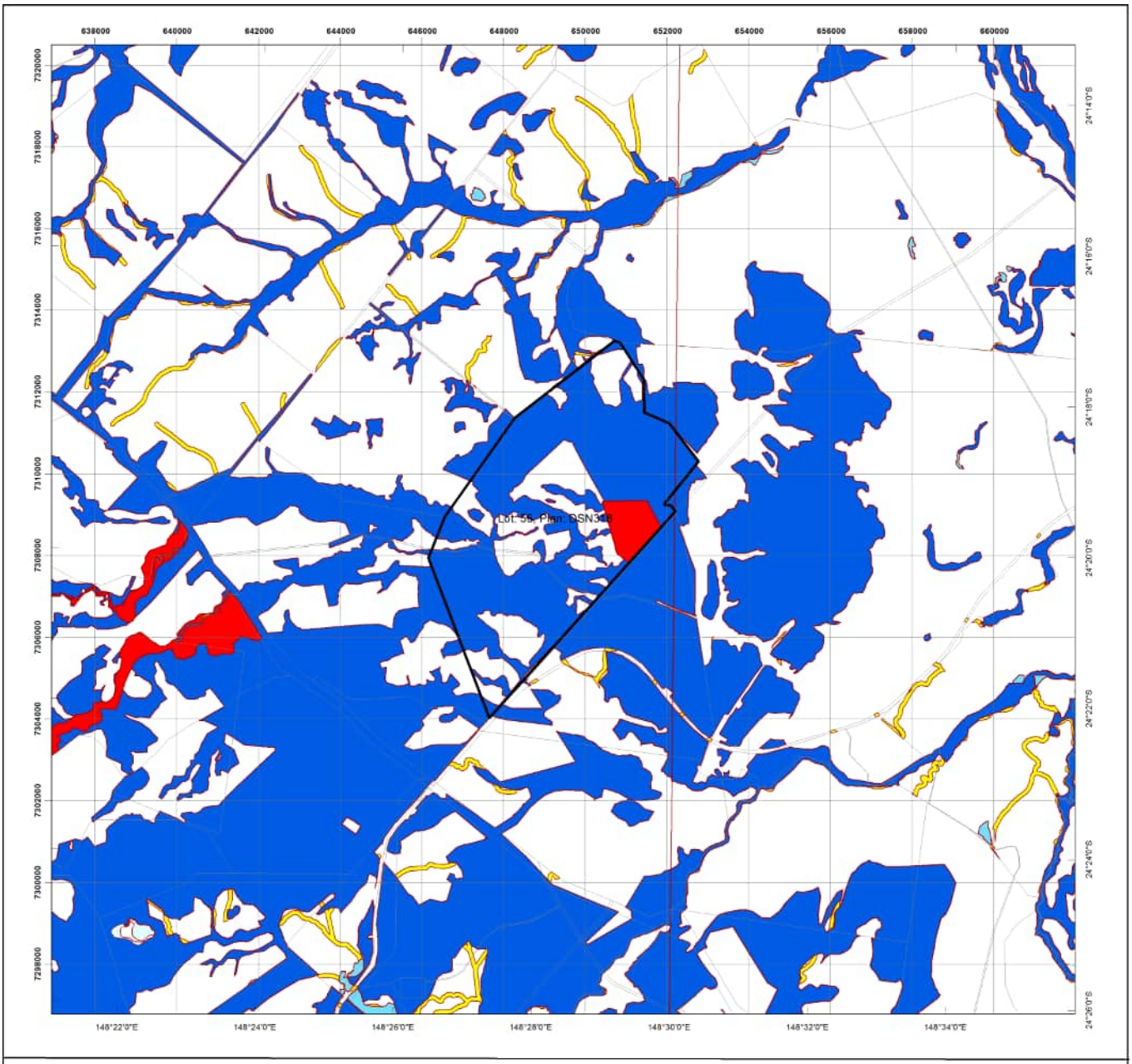
2) in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6



Regulated Vegetation Management Map

Legend

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- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Other land parcel boundaries

N

0 1,300 2,600 3,900 5,200 6,500 m

This product is projected into:
GDA 1994 MGA Zone 55

Disclaimer:
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This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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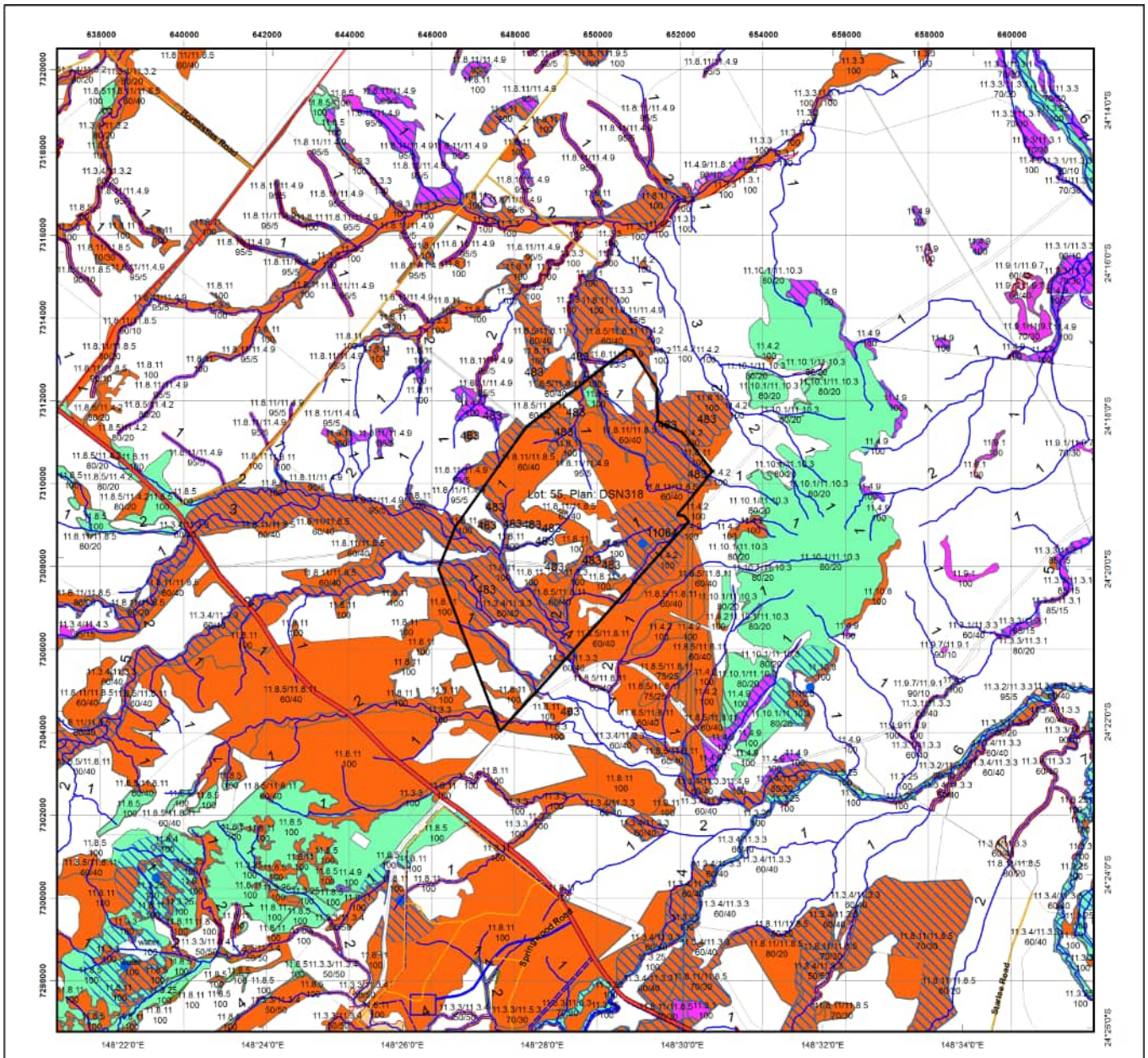

Vegetation Management Supporting Map

Legend

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- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
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- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
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- Street/Local Road
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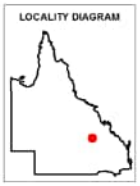

0 975 1,950 2,925 3,900 4,875 m

This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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Vegetation Management Act 1999 - Extract from the essential habitat database

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This report identifies essential habitat in Category A, B and Category C areas.

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Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
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11064	Dichanthium queenslandicum	None	V	tussock grassland occasional with scattered trees of Corymbia spp. or Eucalyptus spp. or Acacia spp.; woodland of Corymbia erythrophloia, or Eucalyptus orgadophila, or Eucalyptus melanophloia with grassy understorey.	100 to 900 m	black cracking clay	flat terrain, gentle undulatling plain

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6
11064	9.8.13, 11.3.4, 11.3.21, 11.4.4, 11.8.5, 11.8.11, 11.9.3

resources.QLD.GOV.AU

Vegetation management report

For Lot: 6 Plan: KL807531

01/06/2021

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 6 April 2020 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

Improvements to the format of the report were made in July 2020 to more clearly delineate the three regulatory frameworks of vegetation management, protected plants and koala habitat protection. The Vegetation Management Pre-clear Regional Ecosystem map was also removed from the Vegetation Management Report but can still be requested as a separate map.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

Table of Contents

1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 6 Plan: KL807531, are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
6	KL807531	Reserve	2,600,000
06	KL807531	Lands Lease	2,600,000

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 6 Plan: KL807531, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Isaac Regional

Bioregion(s)	Subregion(s)
Brigalow Belt	Isaac - Comet Downs

Catchment(s)
Fitzroy

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at
https://www.qld.gov.au/environment/land/vegetation/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at
https://www.qld.gov.au/environment/land/vegetation/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Resources before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://apps.dnrm.qld.gov.au/vegetation/

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.
https://www.qld.gov.au/environment/land/vegetation/area-plans/

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at
https://www.qld.gov.au/environment/land/management/vegetation/development

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:
Phone 135VEG (135 834)
Email vegetation@resources.qld.gov.au
Visit https://www.dnrme.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 6 Plan: KL807531

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 247.83ha

Vegetation category	Area (ha)
Category B	203.8
Category C	41.7
Category R	< 0.1
Category X	2.3

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Resources to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department of Resources to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property:

Reference number

2010/007874

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.25	Least concern	B	52.80	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.25	Least concern	C	4.17	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.3	Of concern	B	99.02	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.3	Of concern	C	25.03	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.3	Of concern	R	0.03	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.4	Of concern	B	52.00	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.3.4	Of concern	C	12.51	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.3.4	Of concern	R	0.01	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
non-rem	None	X	2.26	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or

2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 6 Plan: KL807531.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

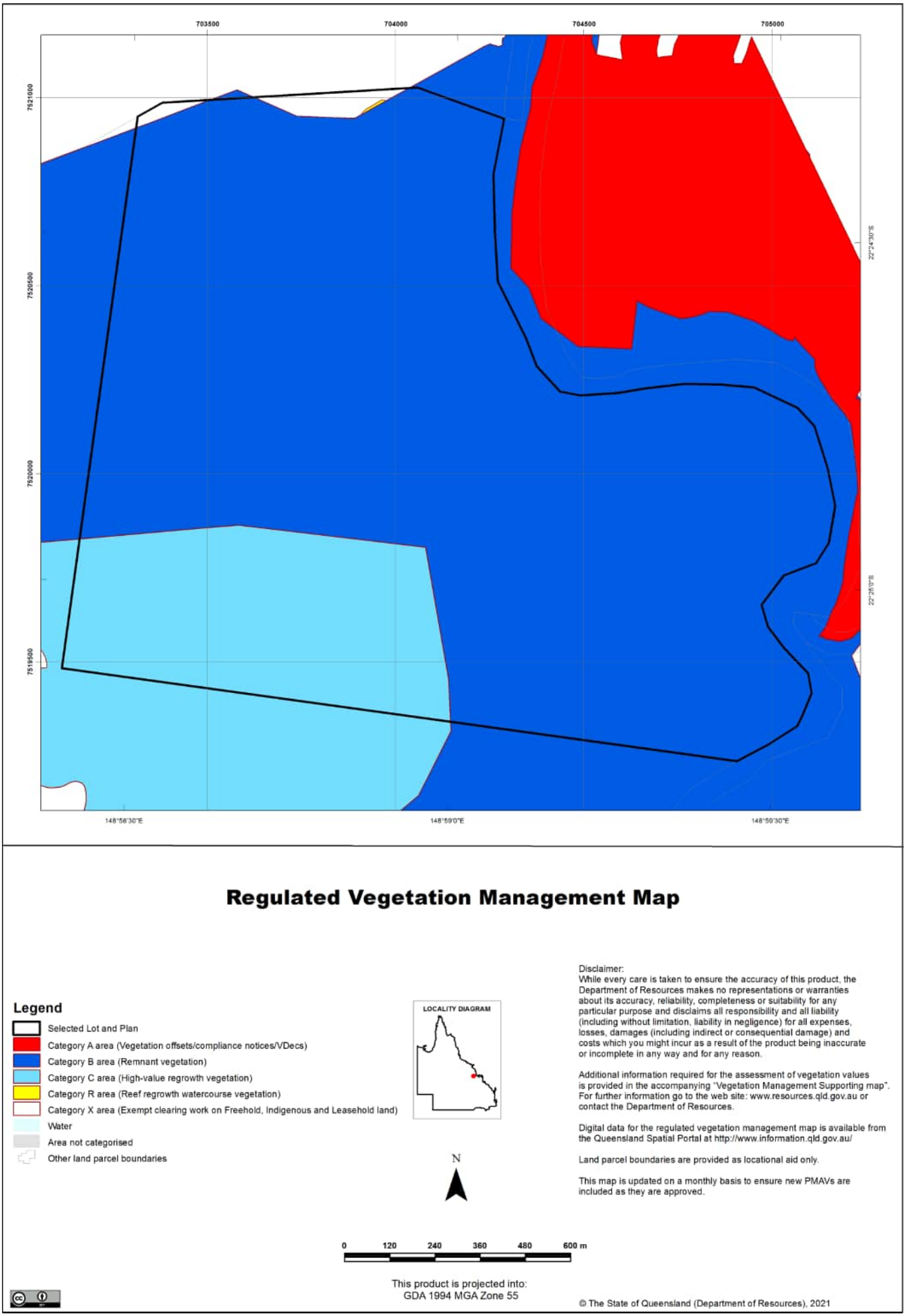
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

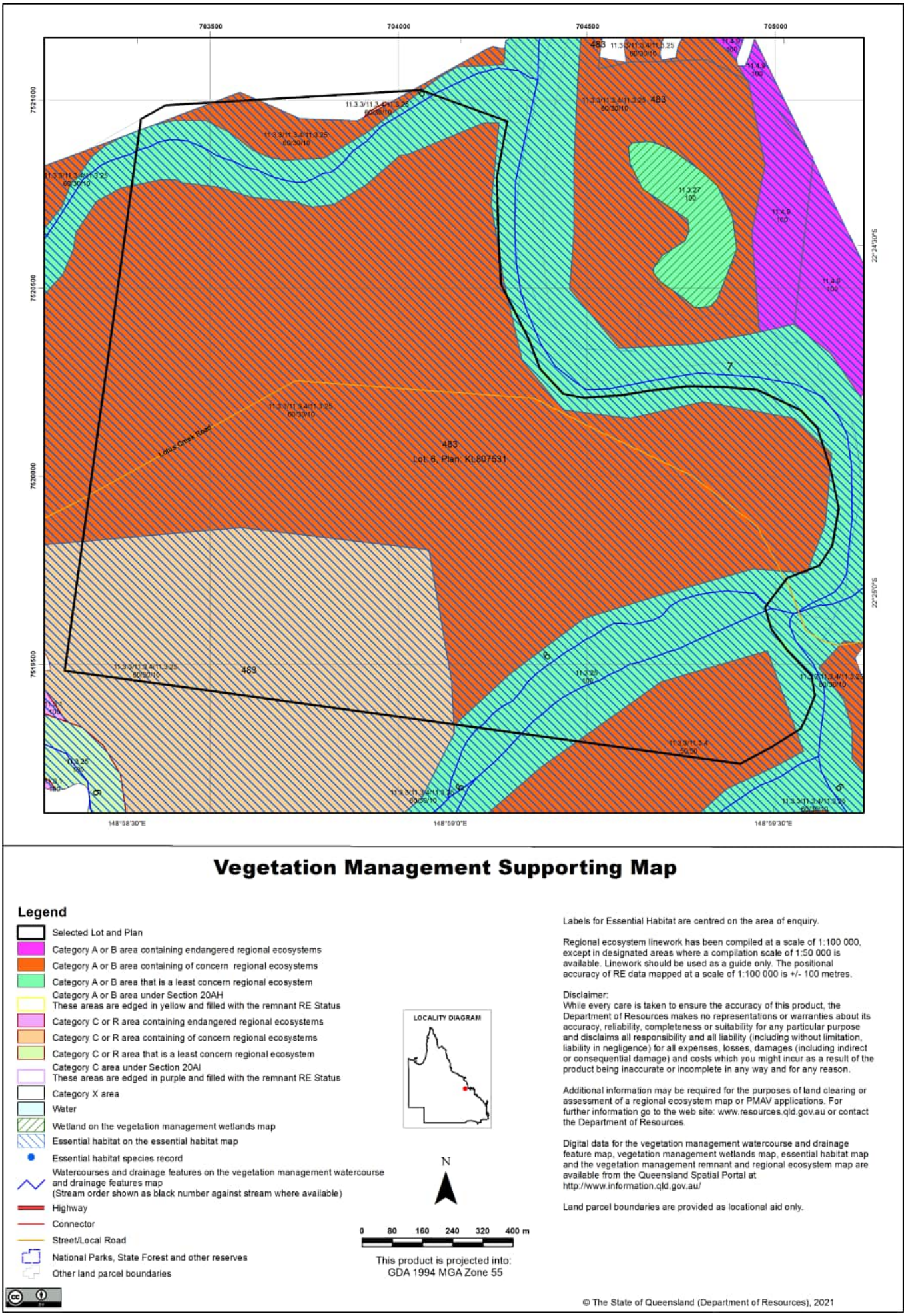
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

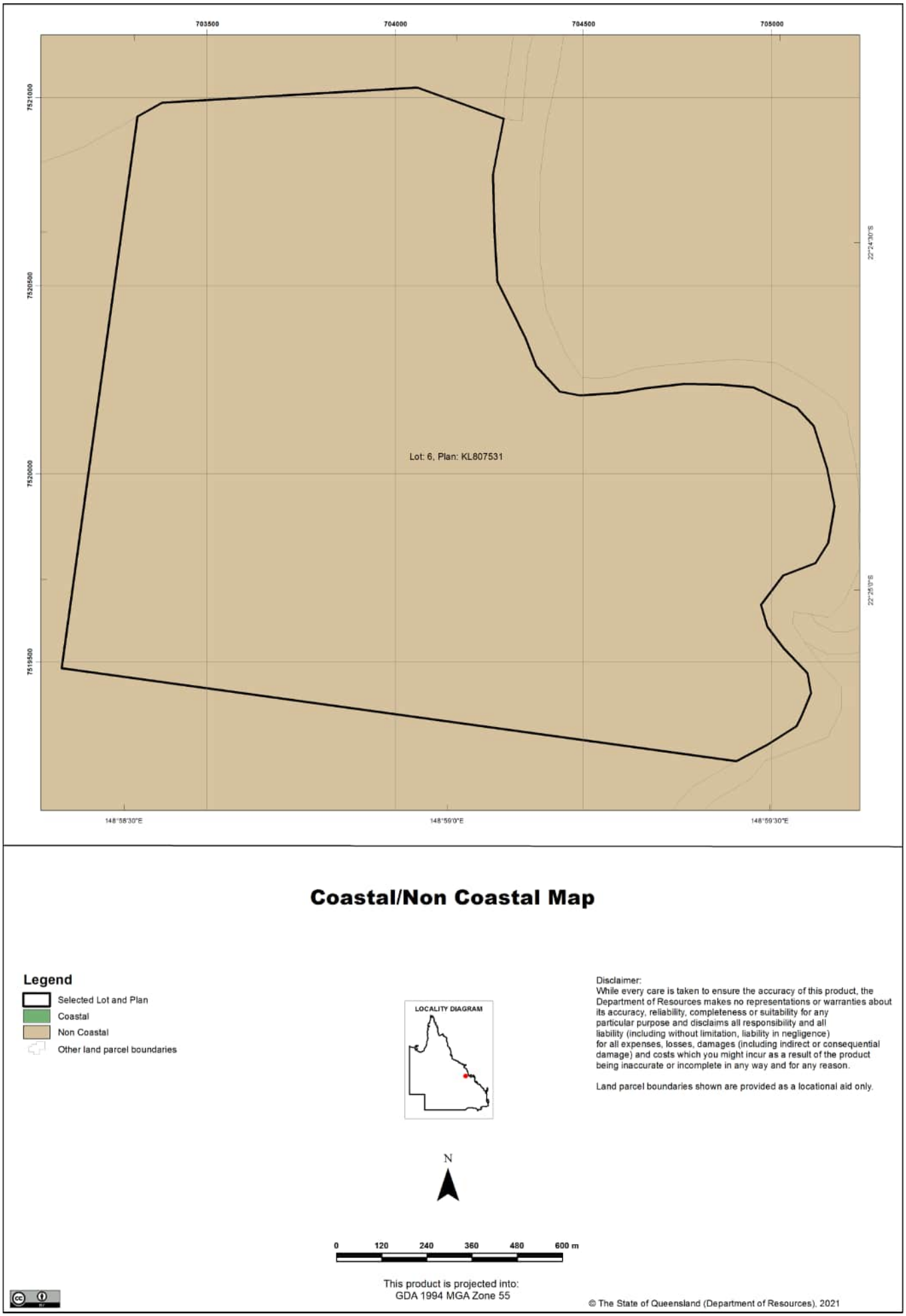
4.1 Regulated vegetation management map



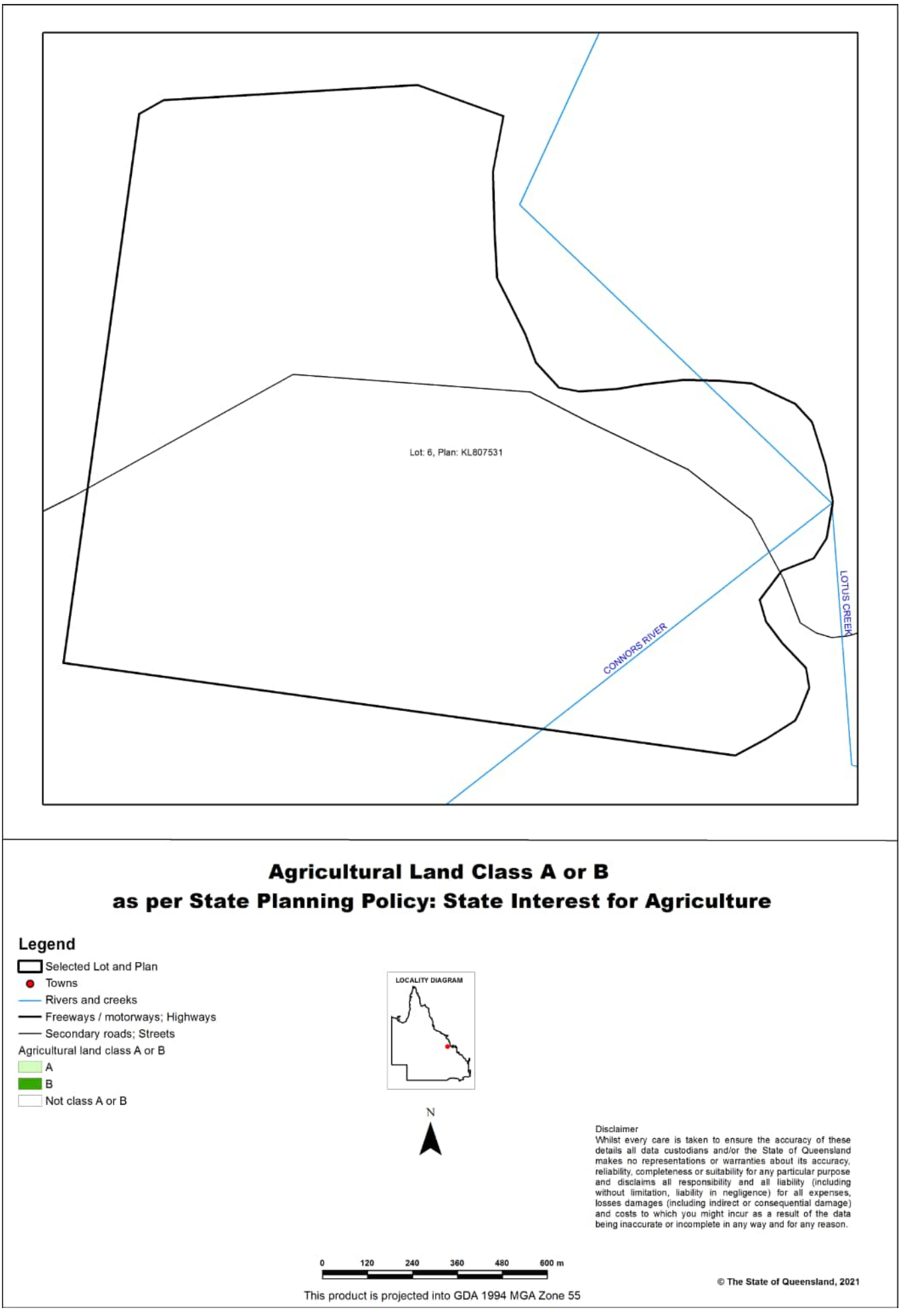
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

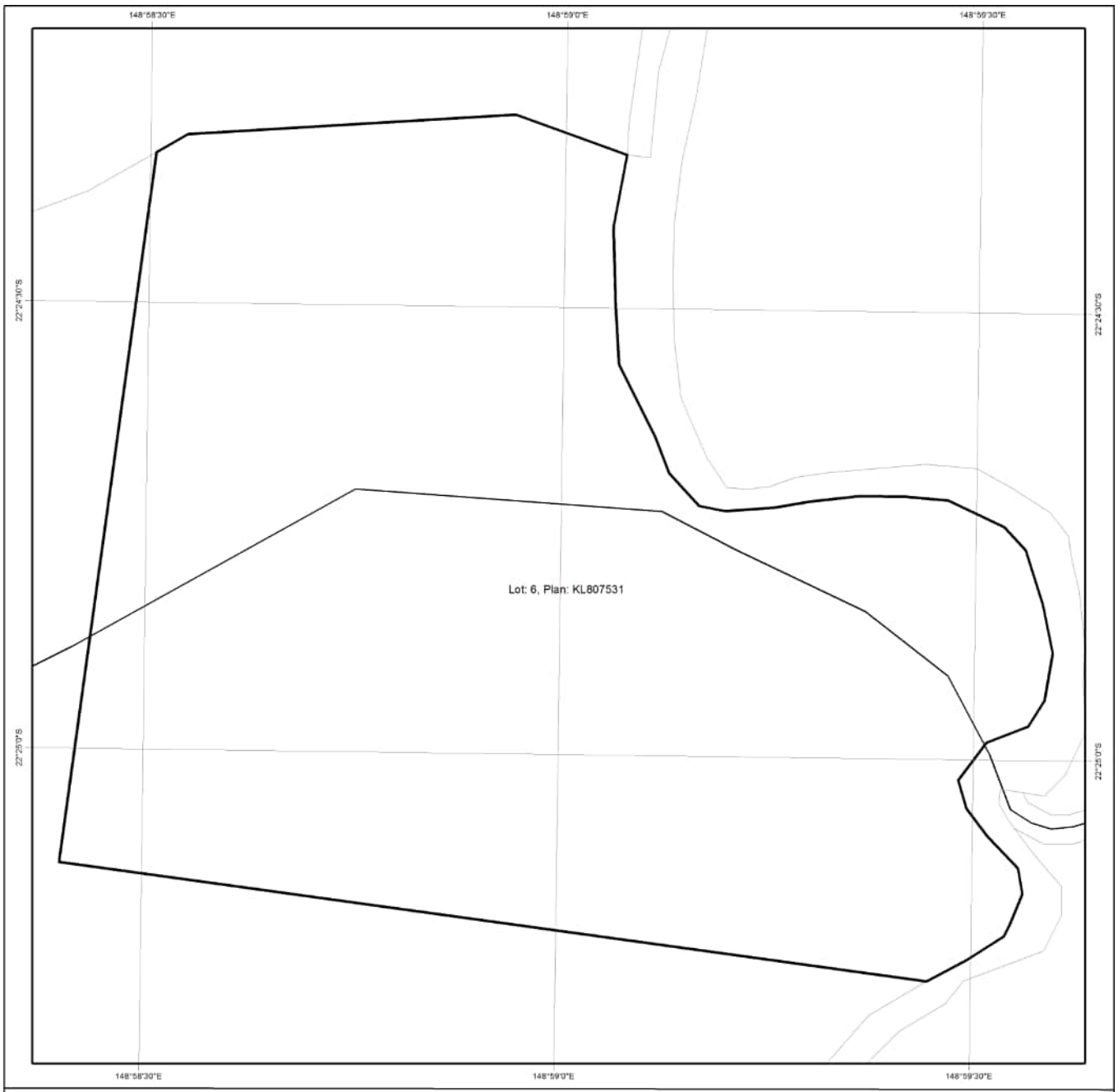
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

Legend

- Selected Lot and Plan
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets

LOCALITY DIAGRAM

N

0 80 160 240 320 400 m

This product is projected into:
GDA 1994 MGA Zone 55

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@des.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2) Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

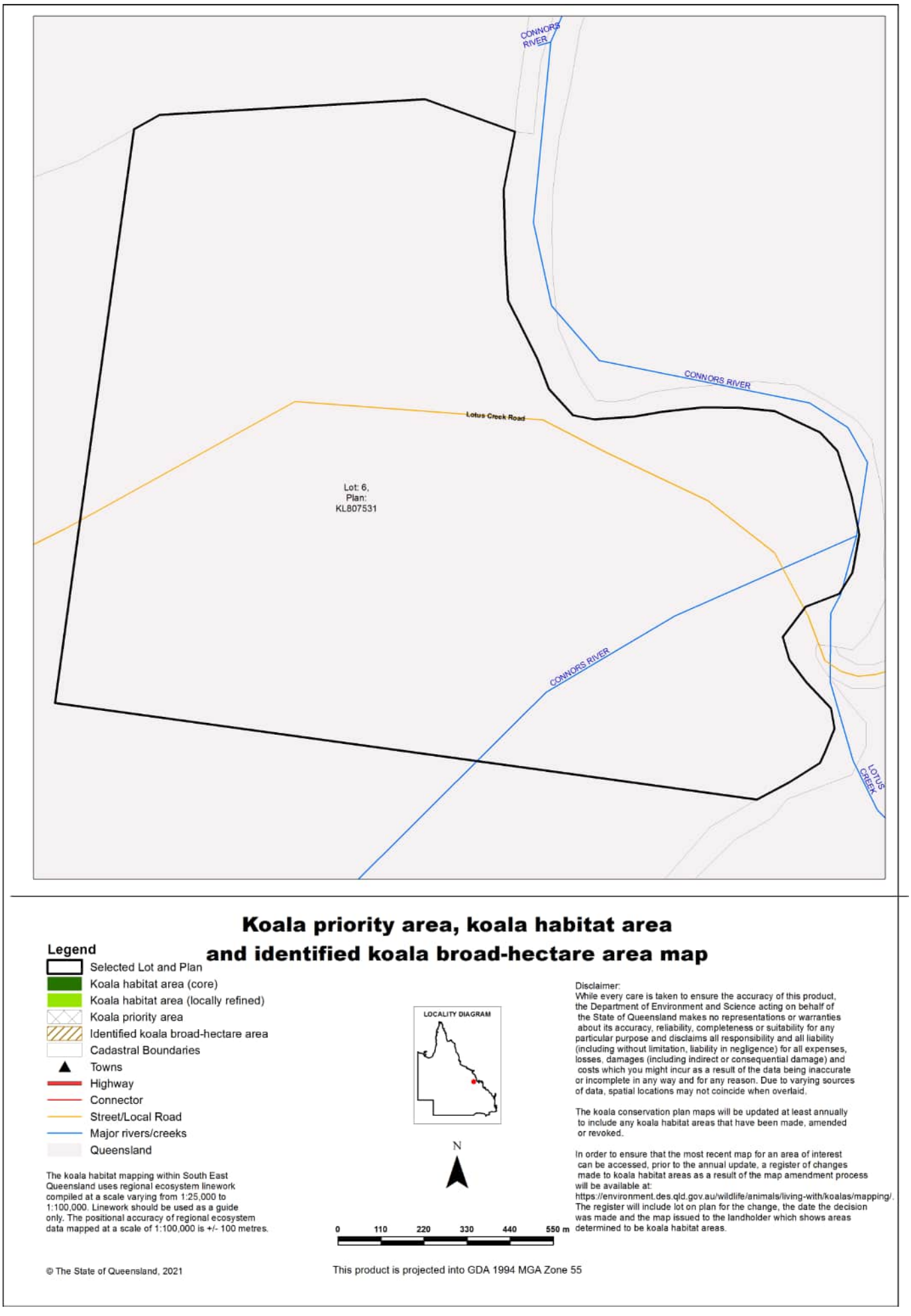
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@des.qld.gov.au
Visit https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 6 Plan: KL807531

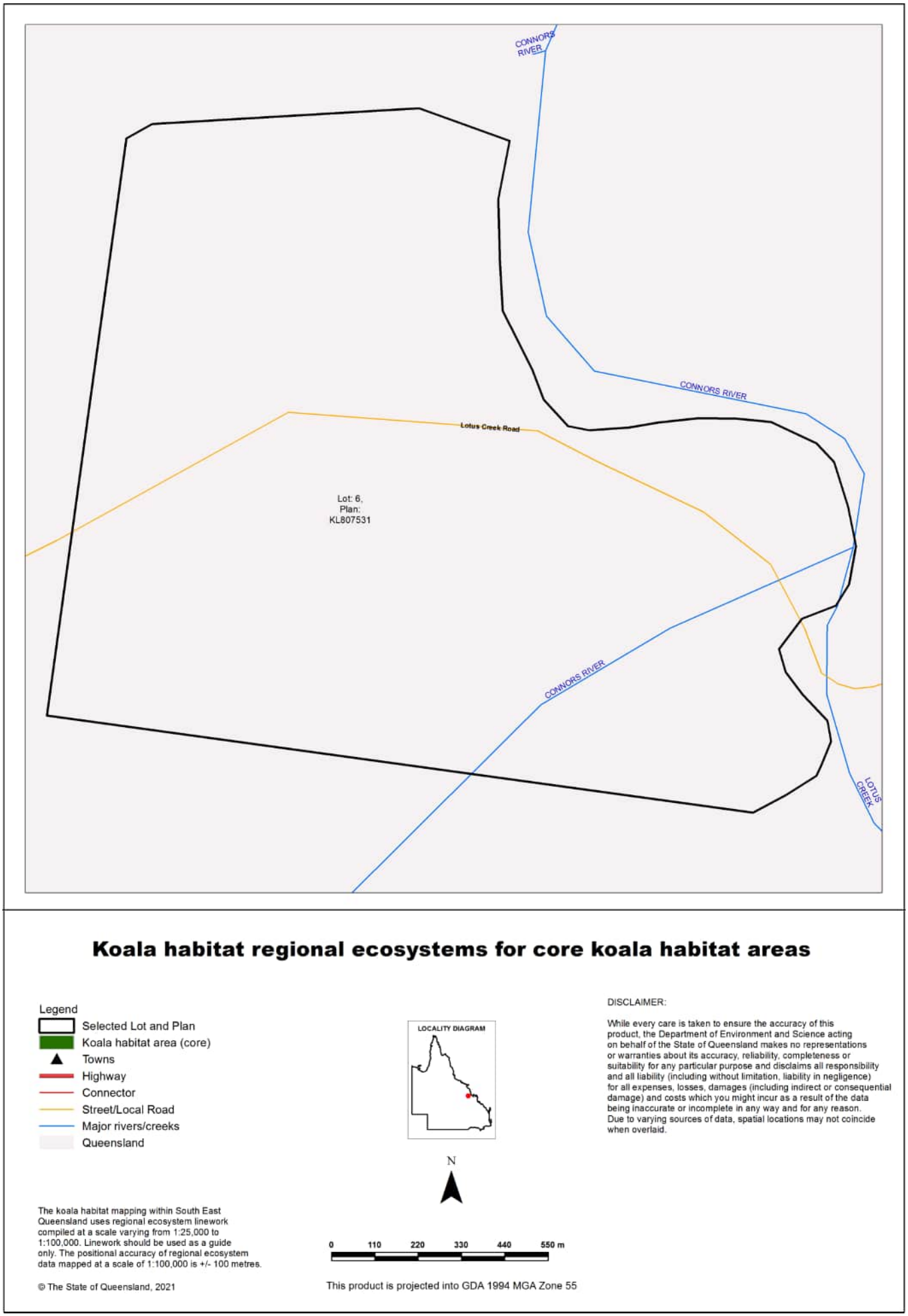
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	*Water Act 2000* *Soil Conservation Act 1986*	Department of Regional Development, Manufacturing and Water (Queensland Government) Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Protected plants and protected areas	*Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.des.qld.gov.au
• Koala mapping and regulations	*Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	*Fisheries Act 1994* *Forestry Act 1959*	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Agriculture, Water and the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office
• Harvesting timber in the Wet Tropics of Qld World Heritage area	*Wet Tropics World Heritage Protection and Management Act 1993*	Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au

resources.QLD.GOV.AU

Vegetation management report

For Lot: 55 Plan: DSN318

16/06/2021

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 6 April 2020 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

Improvements to the format of the report were made in July 2020 to more clearly delineate the three regulatory frameworks of vegetation management, protected plants and koala habitat protection. The Vegetation Management Pre-clear Regional Ecosystem map was also removed from the Vegetation Management Report but can still be requested as a separate map.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

Table of Contents

1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 55 Plan: DSN318, are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
55	DSN318	Freehold	30,335,240
B	SP107596	Easement	193,100
C	SP107596	Easement	220,700

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 55 Plan: DSN318, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Central Highlands Regional

Bioregion(s)	Subregion(s)
Brigalow Belt	Basalt Downs

Catchment(s)
Fitzroy

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at
https://www.qld.gov.au/environment/land/vegetation/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at
https://www.qld.gov.au/environment/land/vegetation/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Resources before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://apps.dnrm.qld.gov.au/vegetation/

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.
https://www.qld.gov.au/environment/land/vegetation/area-plans/

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at
https://www.qld.gov.au/environment/land/management/vegetation/development

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:
Phone 135VEG (135 834)
Email vegetation@resources.qld.gov.au
Visit https://www.dnrme.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 55 Plan: DSN318

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 3045.99ha

Vegetation category	Area (ha)
Category A	137.3
Category B	2018.0
Category X	890.8

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Resources to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department of Resources to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property:

Reference number

2017/003924

2015/002362

2011/007674

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.3	Of concern	A	0.51	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.3	Of concern	B	281.80	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.4	Of concern	B	287.23	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.4.2	Of concern	A	28.38	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Sparse
11.4.2	Of concern	B	81.96	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Sparse
11.8.11	Of concern	A	65.05	Dichanthium sericeum grassland on Cainozoic igneous rocks	Grassland Sch 4
11.8.11	Of concern	B	988.16	Dichanthium sericeum grassland on Cainozoic igneous rocks	Grassland Sch 4
11.8.5	Least concern	A	43.33	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	Very sparse
11.8.5	Least concern	B	378.80	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	Very sparse
non-rem	None	X	890.76	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

Vegetation management wetlands are present on this property and are shown on the vegetation management supporting map in section 4.2 of this report.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or

2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.
11064	Dichanthium queenslandicum	king bluegrass	V	tussock grassland occasional with scattered trees of Corymbia spp. or Eucalyptus spp. or Acacia spp.; woodland of Corymbia erythrophloia, or Eucalyptus orgadophila, or Eucalyptus melanophloia with grassy understorey.	100 to 900 m	black cracking clay	flat terrain or gentle undulatling plain

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6
11064	9.8.13, 11.3.21, 11.8.11

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

Class A (with urban areas masked as per SPP): 2112.82ha

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 55 Plan: DSN318.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

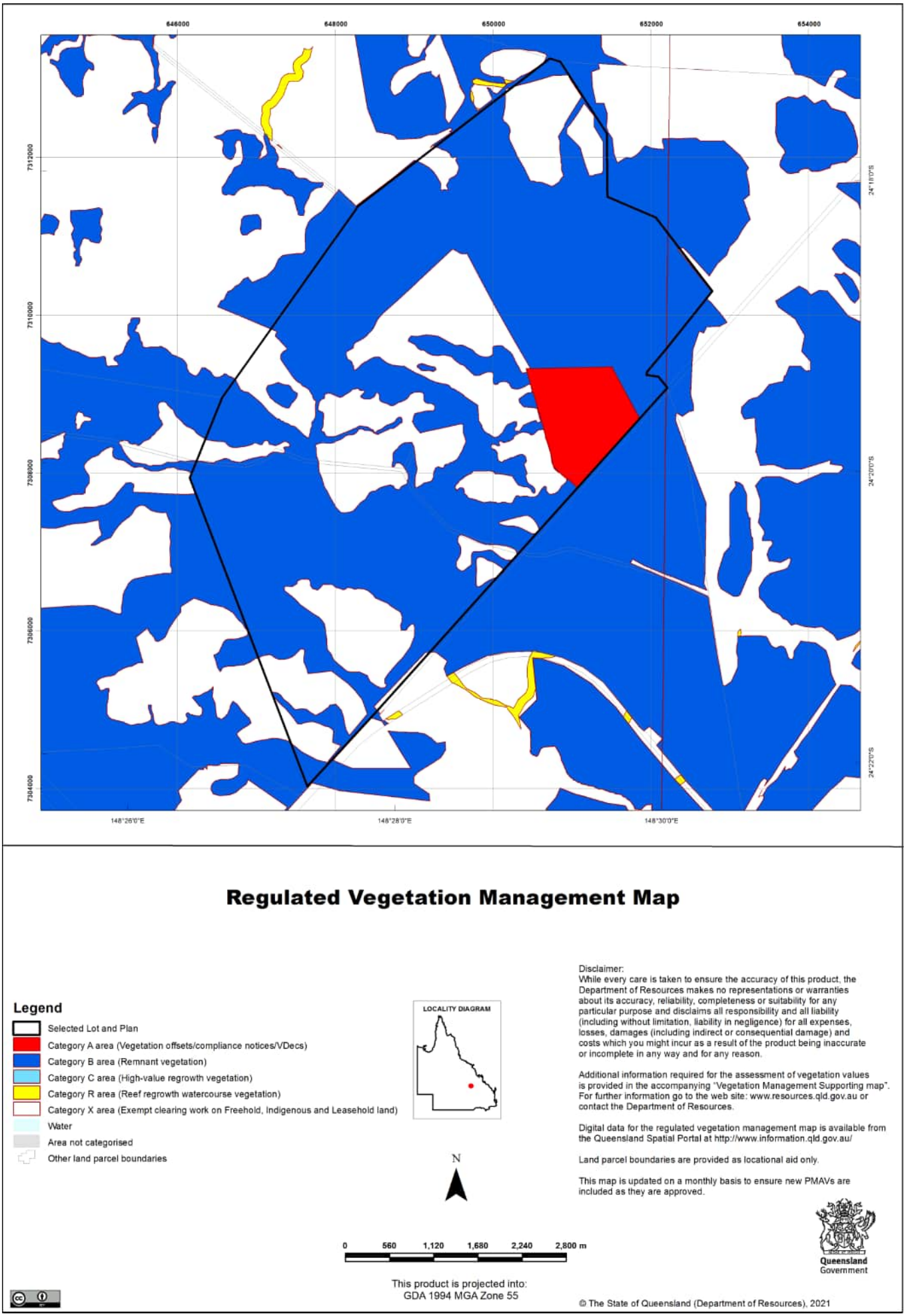
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

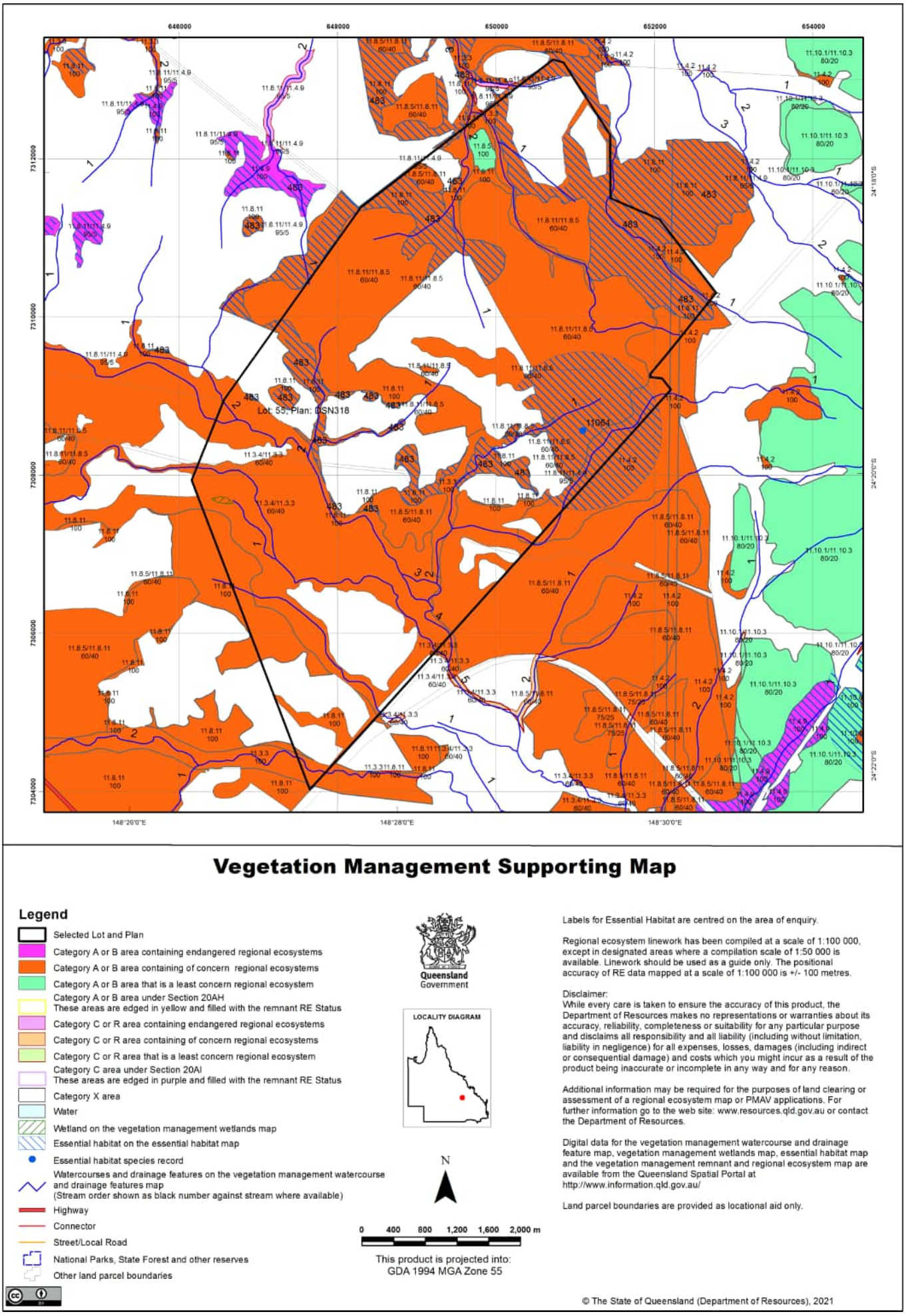
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

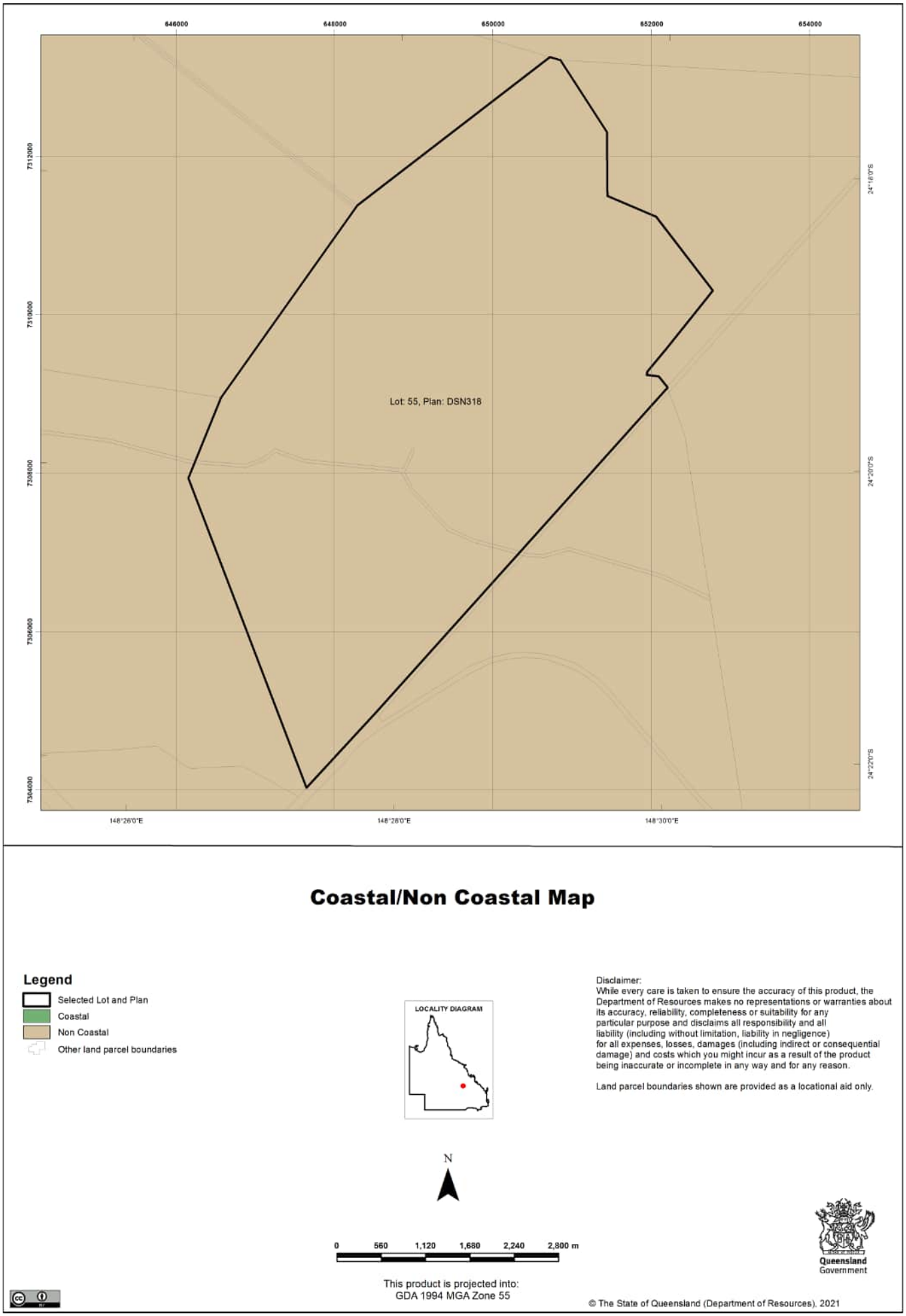
4.1 Regulated vegetation management map



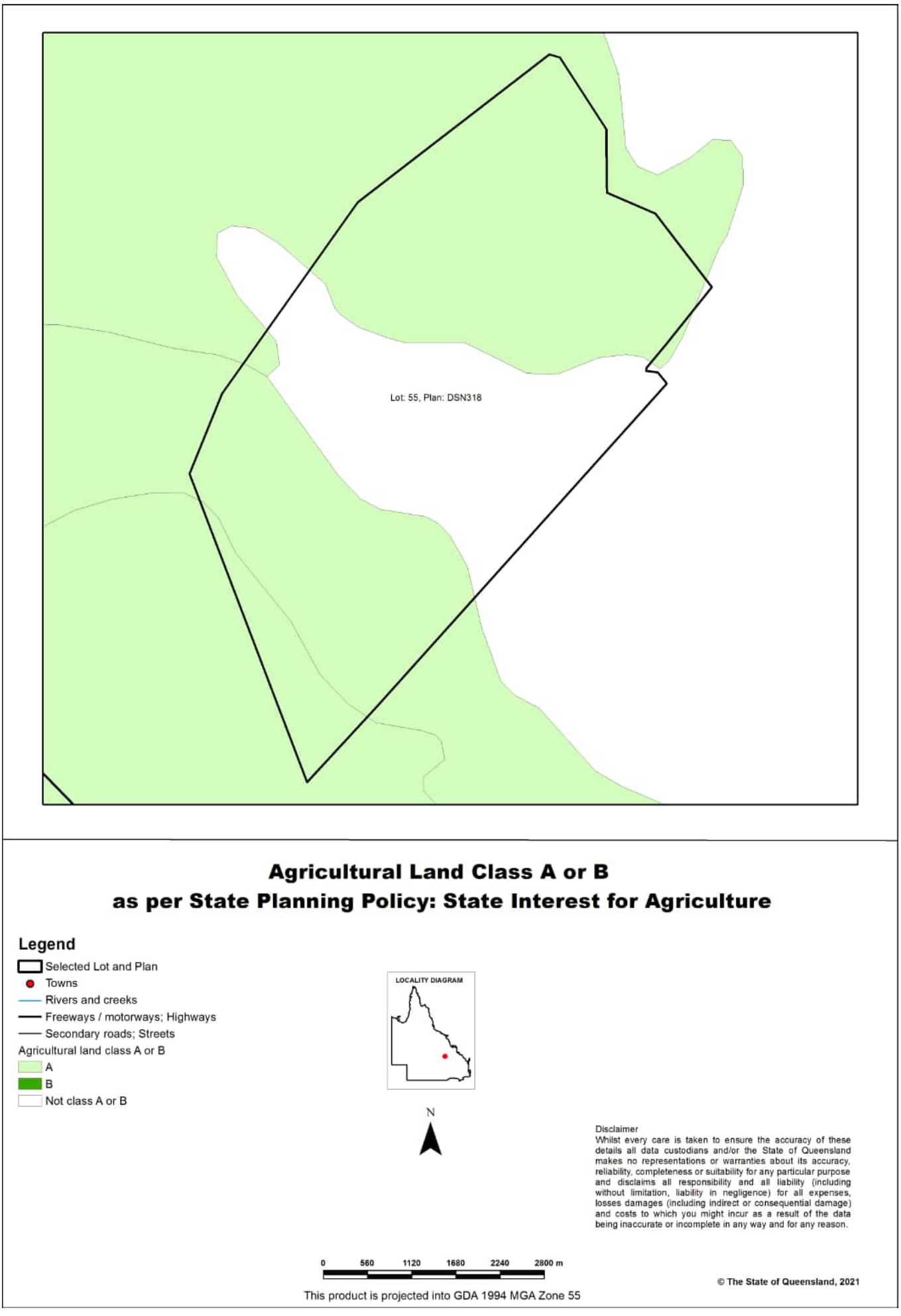
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the clearing of protected plants for more information.

Protected Plants Flora Survey Trigger Map

Legend

- Selected Lot and Plan
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets

N

0 370 740 1,110 1,480 1,850 m

This product is projected into:
GDA 1994 MGA Zone 55

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Science at palm@des.qld.gov.au

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2) Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

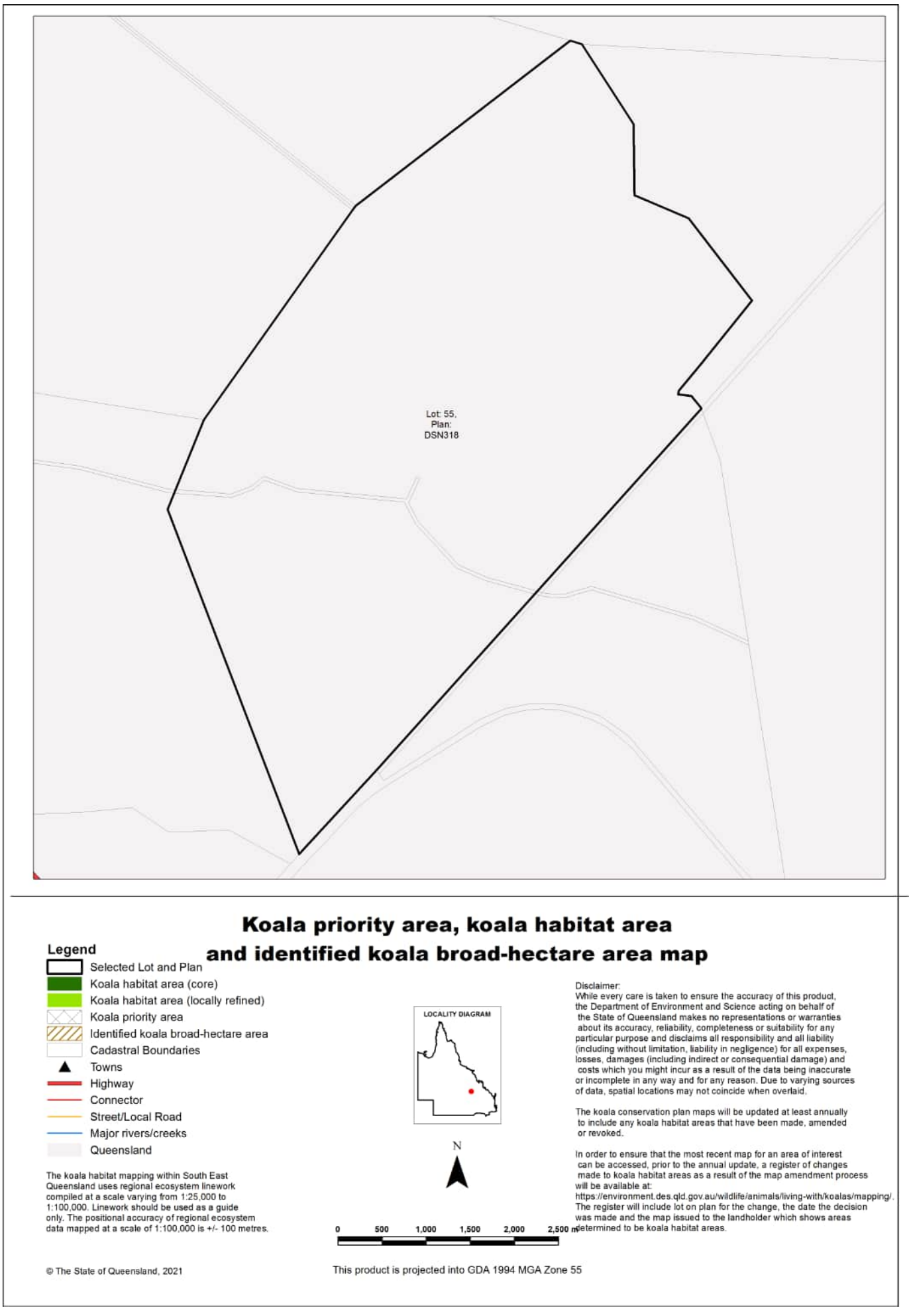
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@des.qld.gov.au
Visit https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 55 Plan: DSN318

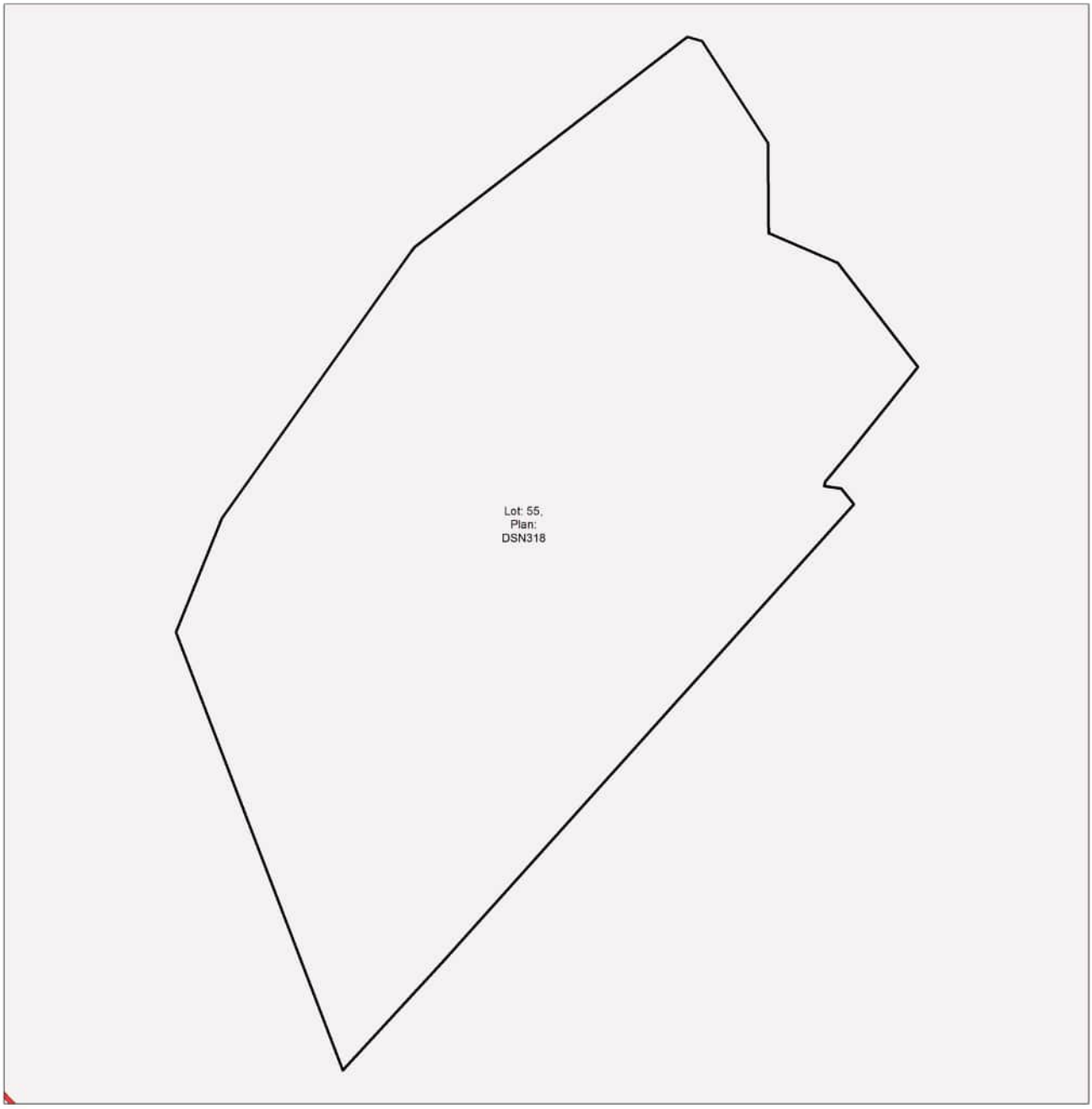
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



Koala habitat regional ecosystems for core koala habitat areas

Legend

- Selected Lot and Plan
- Koala habitat area (core)
- Towns
- Highway
- Connector
- Street/Local Road
- Major rivers/creeks
- Queensland

LOCALITY DIAGRAM

N

0 500 1,000 1,500 2,000 2,500 m

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The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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This product is projected into GDA 1994 MGA Zone 55

8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	*Water Act 2000* *Soil Conservation Act 1986*	Department of Regional Development, Manufacturing and Water (Queensland Government) Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Protected plants and protected areas	*Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.des.qld.gov.au
• Koala mapping and regulations	*Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	*Fisheries Act 1994* *Forestry Act 1959*	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Agriculture, Water and the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office
• Harvesting timber in the Wet Tropics of Qld World Heritage area	*Wet Tropics World Heritage Protection and Management Act 1993*	Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Status: Rare and threatened species
Records: All
Date: All
Latitude: -24.3238
Longitude: 148.4711
Distance: 20
Email: emily.drummond@e2mconsulting.com.au
Date submitted: Friday 07 May 2021 10:24:59
Date extracted: Friday 07 May 2021 10:30:02

The number of records retrieved = 15

Disclaimer

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

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	1
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Psittacidae	*Psephotus pulcherrimus*	paradise parrot		PE	EX	1
animals	mammals	Megadermatidae	*Macroderma gigas*	ghost bat		E	V	1
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	8
animals	mammals	Pseudocheiridae	*Petauroides armillatus*	central greater glider		V	V	8
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		1
animals	reptiles	Elapidae	*Denisonia maculata*	ornamental snake		V	V	1
animals	reptiles	Scincidae	*Egernia rugosa*	yakka skink		V	V	1
plants	land plants	Asteraceae	*Trioncinia retroflexa*			E		2/2
plants	land plants	Cyperaceae	*Cyperus clarus*			V		3/3
plants	land plants	Maundiaceae	*Maundia triglochinoides*			V		2
plants	land plants	Poaceae	*Dichanthium queenslandicum*			V	E	13/12
plants	land plants	Poaceae	*Digitaria porrecta*			NT		10/10
plants	land plants	Surianaceae	*Cadellia pentastylis*	ooline		V	V	1/1

CODES

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

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

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Status: Rare and threatened species
Records: All
Date: All
Latitude: -22.3888
Longitude: 148.9440
Distance: 20
Email: emily.drummond@e2mconsulting.com.au
Date submitted: Friday 07 May 2021 10:37:51
Date extracted: Friday 07 May 2021 10:40:02

The number of records retrieved = 4

Disclaimer

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	5
animals	reptiles	Chelidae	*Rheodytes leukops*	Fitzroy River turtle		V	V	2
animals	reptiles	Chelidae	*Elseya albagula*	southern snapping turtle		CR	CE	1
plants	land plants	Poaceae	*Dichanthium queenslandicum*			V	E	1/1

CODES

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

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

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix B Habitat Quality Site Data

HPE Project - Croydon Offset - Target Protected Matters

ornamental snake habitat

Assessment Unit	**1**			**1**			
Site	BC1			BC2			
Regional ecosystem	11.4.9			11.4.9			
Broad condition state	regrowth			regrowth			
Biocondition attribute	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark
Recruitment of woody perennial species (%)	100	100	5	100	100	5	100
Native plant species richness - trees (No.)	5	4	2.5	5	2	2.5	5
Native plant species richness - shrubs (No.)	10	5	2.5	10	10	5	10
Native plant species richness - grasses (No.)	5	3	2.5	5	5	5	5
Native plant species richness - forbs (No.)	10	3	2.5	10	7	2.5	10
Tree emergent height (m)	na			na			na
Tree canopy height (m)	13	0	0	13	4	3	13
Tree sub-canopy height (m)	8	0	0	8	1.5	0	8
Tree height - average			0			1.5	
Tree emergent cover (%)	na			na			na
Tree canopy cover (%)	25	0	0	25	0	0	25
Tree sub-canopy cover (%)	10	0	0	10	0	0	10
Tree cover - average			0			0	
Native shrub canopy cover (%)	5	20	3	5	25.1	3	5
Native perennial grass cover (%)	20	1.4	0	20	0	0	20
Organic litter (%)	45	18.8	3	45	11	3	45
Large trees/ha - total	45	0	0	45	0	0	45
Coarse woody debris (m/ha)	1200	20	0	1200	0	0	1200
Non-native plant cover (%)	0	15	5	0	20	5	0
Maximum site-based score	80			80			80
Site-based BioCondition score (out of 10)			**3.25**			**4.06**	

Assessment Unit (AU)	**1**
Current AU BioCondition Score	3.41
AU Area	265.88
Current AU Weighted BioCondition Score	3.41

Current BioCondition Score (out of 10)	**3.41**

1		1			1			1			
BC3		BC4			BC5			BC7			
11.4.9		11.4.9			11.4.9			11.4.9			
regrowth		regrowth			regrowth			regrowth			
Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark
100	5	100	100	5	100	100	5	100	100	5	100
4	2.5	5	3	2.5	5	2	2.5	5	3	2.5	5
7	2.5	10	5	2.5	10	10	5	10	6	2.5	10
3	2.5	5	3	2.5	5	5	5	5	4	2.5	5
5	2.5	10	5	2.5	10	6	2.5	10	6	2.5	10
		na			na			na			na
2.5	0	13	4	3	13	3	0	13	3	0	13
1.5	0	8	2	3	8	1	0	8	1	0	8
	0			3			0			0	
		na			na			na			na
0	0	25	0	0	25	0	0	25	0	0	25
0	0	10	0	0	10	0	0	10	0	0	10
	0			0			0			0	
13	3	5	30.4	3	5	27	3	5	11.3	3	5
0.4	0	20	0.6	0	20	0.6	0	20	0.6	0	20
32	5	45	15.8	3	45	14	3	45	18	3	45
0	0	45	0	0	45	0	0	45	0	0	45
20	0	1200	35	0	1200	25	0	1200	50	0	1200
15	5	0	15	5	0	15	5	0	40	3	0
		80			80			80			80
	3.50			**3.63**			**3.88**			**3.00**	

1		1			1			
BC8		BC9			BC11			
11.4.9		11.4.9			11.4.9			
regrowth		regrowth			regrowth			
Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	
100	5	100	100	5	100	100	5	
2	2.5	5	2	2.5	5	3	2.5	
6	2.5	10	7	2.5	10	6	2.5	
1	0	5	1	0	5	3	2.5	
4	2.5	10	3	2.5	10	3	2.5	
		na			na			
5	3	13	7	3	13	4.5	3	
1	0	8	2	3	8	1.5	0	
	1.5			3			1.5	
		na			na			
0	0	25	0	0	25	5.1	2	
0	0	10	0	0	10	0	0	
	0			0			1	
29.2	3	5	27	3	5	19.4	3	
0	0	20	0	0	20	0.2	0	
3	0	45	6.75	3	45	6.4	3	
0	0	45	0	0	45	0	0	
75	0	1200	20	0	1200	20	0	
10	5	0	5	5	0	40	3	
		80			80			
	2.75			**3.31**			**3.31**	

HPE Project - Croydon Offset - Target Protected Matters

squatter pigeon habitat

Assessment Unit	3			4			5		
Site	BC12			BC03			BC25		
Regional ecosystem	11.3.25			11.8.4			11.8.4		
Broad condition state	Remnant			HVR			Non-remnant		
Biocondition attribute	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
Recruitment of woody perennial species (%)	100	100	5	100	50	3	100	33	3
Native plant species richness - trees (No.)	4	6	5	4	6	5	4	5	5
Native plant species richness - shrubs (No.)	4	4	5	6	2	2.5	6	3	2.5
Native plant species richness - grasses (No.)	8	3	2.5	5	2	2.5	5	2	2.5
Native plant species richness - forbs (No.)	13	6	2.5	6	1	0	6	0	0
Tree emergent height (m)	na			na			na		
Tree canopy height (m)	23	21	5	14	15	5	14	8	3
Tree sub-canopy height (m)	11			8	8	5	8	4	3
Tree height - average			5			5			3
Tree emergent cover (%)	na			na			na		
Tree canopy cover (%)	34	36.6	5	27	13	2	27	0	0
Tree sub-canopy cover (%)	12			7	2	2	7	0	0
Tree cover - average			5			2			0
Native shrub canopy cover (%)	7	4	5	2	0	0	2	0	0
Native perennial grass cover (%)	35	11.4	1	53	5	0	53	7	1
Organic litter (%)	21	61	3	24	19	5	24	14	5
Large trees/ha - total	32	14	5	14	12	10	14	0	0
Coarse woody debris (m/ha)	473	285	5	128	110	5	128	130	5
Non-native plant cover (%)	0	15	5	0	90	0	0	50	3
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)			**6.75**			**5.00**			**3.75**

Assessment Unit (AU)	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Current AU BioCondition Score	6.20	5.13	4.09375	5.79166667	6.08333333	5.90625	3.8	7.58333333
AU Area	150.15	10.99	9.93	4.32	14.92	1.95	37.18	9.36
Current AU Weighted BioCondition Score	3.90	0.24	0.17	0.10	0.38	0.05	0.59	0.30

Current BioCondition Score (out of 10)	**5.66**

6			7			8			9		
BC02			BC04			BC01			BC08		
11.3.3			11.3.4			11.3.1			11.3.1		
Remnant			Remnant			Remnant			Non-remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	100	5	100	66	3	100	100	5	100	100	5
3	2	2.5	4	3	2.5	3	6	5	3	3	5
5	1	0	2	1	2.5	5	6	5	5	1	0
12	3	2.5	7	4	2.5	4	3	2.5	4	3	2.5
15	7	2.5	10	5	2.5	8	2	2.5	8	4	2.5
na			na			na			na		
18	22	5	22	24	5	14	11	5	14	5	3
10	10	5	12	8	3	4	6	5	4	2.75	3
		5			4			5			3
na			na			na			na		
28	43	5	17	25	5	29	38	5	29	0	0
5	0	0	5	0	0	9	22	3	9	35	3
		2.5			2.5			4			1.5
4	0	0	1	0	0	8	5	5	8	0	0
45	14	1	43	25.4	3	8	4.8	3	8	0.6	0
30	51	5	20	62	3	34	37	5	34	52.4	5
10	34	15	35	16	5	70	6	5	70	0	0
285	910	2	384	320	5	1752	1400	5	1752	20	0
0	10	5	0	10	5	0	20	5	0	10	5
80			80			80			80		
		6.00			**5.06**			**7.13**			**3.69**

10			3			4			5		
BC18			BC13			BC26			BC28		
11.3.27b			11.3.25			11.8.4			11.8.4		
Remnant			Remnant			HVR			Non-remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	100	5	100	80	5	100	100	5	100	100	5
1	3	5	4	5	5	4	3	2.5	4	3	2.5
1	3	5	4	3	2.5	6	3	2.5	6	3	2.5
3	1	2.5	8	4	2.5	5	2	2.5	5	2	2.5
6	2	2.5	13	4	2.5	6	3	2.5	6	1	0
na			na			na			na		
16	22	5	23	20	5	14	15	5	14	15	5
na	12		11			8	3	3	8	7	5
		5			5			4			5
na			na			na			na		
40	65	5	34	38.5	5	27	32	5	27	0	0
na	20		12			7	6	5	7	0	0
		5			5			5			0
na	0		7	1.5	3	2	0	0	2	1	5
3	27	5	35	4.4	1	53	33	3	53	15	1
15	44	3	21	17	5	24	12	5	24	16	5
28	16	10	32	18	10	14	4	5	14	2	5
530	600	5	473	210	2	128	40	2	128	60	2
0	1	10	0	15	5	0	50	3	0	60	0
80			80			80			80		
		7.88			**6.69**			**5.25**			**4.44**

6			7			8			9		
BC07			BC06			BC05			BC09		
11.3.3			11.3.4			11.3.1			11.3.1		
Remnant			Remnant			Remnant			Non-remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	50	3	100	75	5	100	100	5	100	100	5
3	2	2.5	4	5	5	3	3	5	3	3	5
5	2	2.5	2	2	5	5	1	0	5	3	2.5
12	3	2.5	7	6	2.5	4	4	5	4	4	5
15	8	2.5	10	2	0	8	2	2.5	8	4	2.5
na			na			na			na		
18	22	5	22	20	5	14	7	3	14	1.5	0
10	12	5	12	10	5	4	2.75	3	4		
		5			5			3			0
na			na			na			na		
28	30	5	17	39	3	29			29	0	0
5	25	3	5	10	5	9	30	3	9	19	3
		4			4			3			1.5
4	0	0	1	0	0	8	8	5	8	0	0
45	1	0	43	8	1	8	2.2	1	8	4	3
30	64	3	20	79	3	34	15.4	3	34	33.4	5
10	40	15	35	8	5	70	0	0	70	0	0
285	1660	2	384	390	5	1752	40	0	1752	50	0
0	20	5	0	5	5	0	20	5	0	40	3
80			80			80			80		
		5.88			**5.69**			**4.69**			**4.06**

10			3			6			1		
BC17			BC14			BC19			BC11		
11.3.27b			11.3.25			11.3.3			11.4.9		
Remnant			Remnant			Remnant			regrowth		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	66	3	100	100	5	100	100	5	100	100	5
1	3	5	4	3	2.5	3	2	2.5	5	3	2.5
1	2	5	4	7	5	5	0	0	10	6	2.5
3	3	5	8	3	2.5	12	2	0	5	3	2.5
6	3	2.5	13	6	2.5	15	2	0	10	3	2.5
na			na			na			na		
16	24	5	23	24	5	18	20	5	13	4.5	3
na	8		11			10	14	5	8	1.5	0
		5			5			5			1.5
na			na			na			na		
40	32	5	34	41.4	5	28	62	3	25	5.1	2
na	26		12			5	0	0	10	0	0
		5			5			1.5			1
na	0		7	12.6	5	4	0	0	5	19.4	3
3	14	5	35	3.4	0	45	0	0	20	0.2	0
15	80	3	21	89	3	30	73	3	45	6.4	3
28	26	10	32	8	5	10	14	15	45	0	0
530	390	5	473	335	5	285	650	2	1200	20	0
0	15	5	0	30	3	0	1	10	0	40	3
80			80			80			80		
		7.31			**6.06**			**5.50**			**3.31**

3			2			10			3		
BC12			BC10			BC27			BC15		
11.3.25			11.4.9			11.3.27b			11.3.25		
Remnant			Non-remnant			Remnant			Remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	100	5	100	100	5	100	100	5	100	67	3
4	6	5	5	3	2.5	1	2	5	4	6	5
4	4	5	10	6	2.5	1	3	5	4	3	2.5
8	3	2.5	5	2	2.5	3	3	5	8	5	2.5
13	6	2.5	10	3	2.5	6	5	2.5	13	5	2.5
na			na			na			na		
23	21	5	13	1	0	16	24	5	23	20	5
11			8	0	0	na	12		11		
		5			0			5			5
na			na			na			na		
34	36.6	5	25	0	0	40	42	5	34	38.7	5
12			10	0	0	na	0		12		
		5			0			5			5
7	4	5	5	6.7	5	na	2		7	3.9	5
35	11.4	1	20	0	0	3	22	5	35	5.6	1
21	61	3	45	18	3	15	31	3	21	87	3
32	14	5	45	0	0	28	16	10	32	6	5
473	285	5	1200	0	0	530	450	5	473	230	2
0	15	5	0	70	0	0	5	5	0	15	5
80			80			80			80		
		6.75			**2.88**			**7.56**			**5.81**

3			3			3			7		
BC14			BC15			BC16			BC20		
11.3.25			11.3.25			11.3.25			11.3.4		
Remnant			Remnant			Remnant			Remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	100	5	100	67	3	100	83	5	100	100	5
4	3	2.5	4	6	5	4	6	5	4	3	2.5
4	7	5	4	3	2.5	4	4	5	2	1	2.5
8	3	2.5	8	5	2.5	8	3	2.5	7	2	2.5
13	6	2.5	13	5	2.5	13	3	0	10	3	2.5
na			na			na			na		
23	24	5	23	20	5	23	21	5	22	24	5
11			11			11			12	10	5
		5			5			5			5
na			na			na			na		
34	41.4	5	34	38.7	5	34	30.5	5	17	41	3
12			12			12			5	10	5
		5			5			5			4
7	12.6	5	7	3.9	5	7	2.1	3	1	1	5
35	3.4	0	35	5.6	1	35	3	0	43	34	3
21	89	3	21	87	3	21	74	3	20	62	3
32	8	5	32	6	5	32	12	5	35	18	10
473	335	5	473	230	2	473	100	2	384	520	5
0	30	3	0	15	5	0	5	5	0	3	10
80			80			80			80		
		6.06			**5.81**			**5.69**			**7.50**

9			9			9			9		
BC21			BC22			BC23			BC24		
11.3.1			11.3.1			11.3.1			11.3.1		
Non-remnant			Non-remnant			Non-remnant			Non-remnant		
Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score	Benchmark	Current value	Current score
100	100	5	100	100	5	100	100	5	100	100	5
3	4	5	3	2	2.5	3	2	2.5	3	3	5
5	5	5	5	4	2.5	5	4	2.5	5	5	5
4	1	2.5	4	2	2.5	4	3	2.5	4	2	2.5
8	2	2.5	8	4	2.5	8	3	2.5	8	4	2.5
na			na			na			na		
14	3	0	14			14	3	0	14	4	3
4	1	3	4			4	0	0	4	2.5	3
		1.5						0			3
na			na			na			na		
29	0	0	29	0	0	29	42	5	29	0	0
9	0	0	9	0	0	9	0	0	9	22	3
		0			0			2.5			1.5
8	20	3	8	26	3	8	10	5	8	12	5
8	0	0	8	3.4	1	8	3	1	8	0	0
34	11.4	3	34	20	5	34	17	5	34	19.2	5
70	0	0	70	0	0	70	0	0	70	0	0
1752	130	0	1752	0	0	1752	40	0	1752	170	0
0	90	0	0	80	0	0	3	10	0	2	10
80			80			80			80		
		3.44			**3.00**			**4.81**			**5.56**

Inderi Habitat Quality Scores

Dichanthium queenslandcium habitat

AU
1
2
3
(blank)

Assessment Unit	**3**			**2**		
Site	B1			B2		
Regional ecosystem	11.8.5			11.8.11		
Broad condition state	Remnant			Non-Remnant		
Biocondition attribute	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
Recruitment of woody perennial species (%)		66	3		0	0
Native plant species richness - trees (No.)	2	3	5	na	0	
Native plant species richness - shrubs (No.)	3	3	5	na	0	
Native plant species richness - grasses (No.)	6	7	5	11	5	2.5
Native plant species richness - forbs (No.)	16	8	2.5	17	6	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	15	14	5	na	0	
Tree sub-canopy height (m)	5	5	5	na	0	
Tree height - average			5			
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	13	8.5	5	na	0	
Tree sub-canopy cover (%)	3	1	2	na	0	
Tree cover - average			3.5			
Native shrub canopy cover (%)	2	2	5	na	0	
Native perennial grass cover (%)	60	14	1	43	14	1
Organic litter (%)	25	14	5	13	6	3
Large trees/ha - total	6	8	15	na		
Coarse woody debris (m/ha)	250	75	2	na		
Non-native plant cover (%)	0	15	5	0	40	3
Maximum site-based score			80			30
Site-based BioCondition score (out of 10)			**7.75**			**4**

Assessment Unit (AU)	**3**	**2**
AU BioCondition Score	6.08035714	3.95833333
AU Area	26.78	39.83
AU Weighted BioCondition Score	2.44455734	2.36691813

BioCondition Score (out of 10)	**4.81**

2			2			2			2		
B3			B4			B6			B7		
11.8.11			11.8.11			11.8.11			11.8.11		
Non-Remnant			Non-Remnant			Non-Remnant			Non-Remnant		
Benchmark	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
	0	0		0	0		0	0		0	0
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
11	5	2.5	11	7	2.5	11	6	2.5	11	5	2.5
17	5	2.5	17	4	0	17	7	2.5	17	6	2.5
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
43	14	1	43	10	1	43	19	1	43	12	1
13	6	3	13	8	5	13	14	5	13	7	5
na			na			na			na		
na			na			na			na		
0	40	3	0	25	3	0	25	3	0	15	5
		30			30			30			30
		4			**3.83333333**			**4.66666667**			**5.33333333**

2			3			3			3		
B8			B9			BC10			BC2		
11.8.11			11.8.5			11.8.5			11.8.5		
Non-Remnant			Remnant			Non-remnant			Remnant		
Benchmark	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
	0	0		100	5		100	5		100	5
na	0		2	2	5	2	2	5	2	2	5
na	0		3	2	2.5	3	2	2.5	3	5	5
11	5	2.5	6	8	5	6	9	5	6	8	5
17	5	2.5	16	7	2.5	16	5	2.5	16	5	2.5
na	0		na	0		na	0		na	0	
na	0		15	14	5	15	13	5	15	10	3
na	0		5	6	5	5	0	0	5	6	5
					5			2.5			4
na	0		na	0		na	0		na	0	
na	0		13	26	5	13	2	2	13	8	5
na	0		3	21	3	3	2.6	5	3	0	0
					4			3.5			2.5
na	0		2	0	0	2	0	0	2	6	3
43	16	1	60	27	1	60	0.4	0	60	21.6	1
13	10	5	25	14	5	25	2.2	0	25	14.8	5
na			6	12	15	6	2	5	6	8	15
na			250	280	5	250	50	2	250	65	2
0	15	5	0	20	5	0	60	0	0	30	3
		30			80			80			80
		5.33333333			**7.5**			**4.125**			**7.25**

2			2			3			3		
BC5			BC6			BC7			BC8		
11.8.11			11.8.11			11.8.5			11.8.5		
Non-remnant			Non-remnant			Remnant			Remnant		
Benchmark	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
	0	0		0	0		66	3		100	5
na	0		na	0		2	3	5	2	2	5
na	0		na	1		3	3	5	3	4	5
11	8	2.5	11	6	2.5	6	6	5	6	4	2.5
17	3	0	17	6	2.5	16	5	2.5	16	4	2.5
na	0		na	0		na	0		na	0	
na	0		na	0		15	15	5	15	15	5
na	0		na	0		5	6	5	5	7	5
								5			5
na	0		na	0		na	0		na	0	
na	0		na	0		13	13.3	5	13	0	0
na	0		na	0		3	2.7	5	3	0.4	2
								5			1
na	0		na	0		2	1.4	5	2	0.2	3
43	0.4	0	43	0	0	60	0.8	0	60	0	0
13	6.4	3	13	6.2	3	25	5	3	25	6.8	3
na			na			6	2	5	6	0	0
na			na			250	30	2	250	10	0
0	65	0	0	65	0	0	55	0	0	45	3
		30			30			80			80
		1.83333333			**2.66666667**			**5.6875**			**4.375**

	3		
	BC9		
	11.8.5		
	Remnant		
Benchmark	**Value**	**Score**	
	66	3	
2	3	5	
3	4	5	
6	7	5	
16	5	2.5	
na	0		
15	13	5	
5	7	5	
		5	
na	0		
13	13.7	5	
3	1	2	
		3.5	
2	0	0	
60	1.8	0	
25	22	5	
6	2	5	
250	220	5	
0	30	3	
		80	
		5.875	

Inderi Habitat Quality Scores

Regulated vegetation (of concern RE 11.8.11)

AU
1
2
3
(blank)

Assessment Unit	**2**			**2**		
Site	B2			B3		
Regional ecosystem	11.8.11			11.8.11		
Broad condition state	Non-Remnant			Non-Remnant		
Biocondition attribute	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
Recruitment of woody perennial species (%)		0	0		0	0
Native plant species richness - trees (No.)	na	0		na	0	
Native plant species richness - shrubs (No.)	na	0		na	0	
Native plant species richness - grasses (No.)	11	5	2.5	11	5	2.5
Native plant species richness - forbs (No.)	17	6	2.5	17	5	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	na	0		na	0	
Tree sub-canopy height (m)	na	0		na	0	
Tree height - average						
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	na	0		na	0	
Tree sub-canopy cover (%)	na	0		na	0	
Tree cover - average						
Native shrub canopy cover (%)	na	0		na	0	
Native perennial grass cover (%)	43	14	1	43	14	1
Organic litter (%)	13	6	3	13	6	3
Large trees/ha - total	na			na		
Coarse woody debris (m/ha)	na			na		
Non-native plant cover (%)	0	40	3	0	40	3
Maximum site-based score			30			30
Site-based BioCondition score (out of 10)			**4**			**4**

Assessment Unit (AU)	**2**
AU BioCondition Score	3.95833333
AU Area	39.83
AU Weighted BioCondition Score	3.95833333

2			2			2			2		
B4			B6			B7			B8		
11.8.11			11.8.11			11.8.11			11.8.11		
Non-Remnant			Non-Remnant			Non-Remnant			Non-Remnant		
Benchmark	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
	0	0		0	0		0	0		0	0
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
11	7	2.5	11	6	2.5	11	5	2.5	11	5	2.5
17	4	0	17	7	2.5	17	6	2.5	17	5	2.5
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
na	0		na	0		na	0		na	0	
43	10	1	43	19	1	43	12	1	43	16	1
13	8	5	13	14	5	13	7	5	13	10	5
na			na			na			na		
na			na			na			na		
0	25	3	0	25	3	0	15	5	0	15	5
		30			30			30			30
		3.83333333			**4.66666667**			**5.33333333**			**5.33333333**

2			2			
BC5			BC6			
11.8.11			11.8.11			
Non-remnant			Non-remnant			
Benchmark	**Value**	**Score**	**Benchmark**	**Value**	**Score**	
	0	0		0	0	
na	0		na	0		
na	0		na	1		
11	8	2.5	11	6	2.5	
17	3	0	17	6	2.5	
na	0		na	0		
na	0		na	0		
na	0		na	0		
na	0		na	0		
na	0		na	0		
na	0		na	0		
na	0		na	0		
43	0.4	0	43	0	0	
13	6.4	3	13	6.2	3	
na			na			
na			na			
0	65	0	0	65	0	
		30			30	
		1.83333333			**2.66666667**	

Appendix C BioCondition Survey Sites

Croydon Station - BioCondition survey site attribute scores

Assessment Unit	**1**			**2**			**1**			**3**	
Site	BC1			BC10			BC11			BC12	
Regional ecosystem	11.4.9			11.4.9			11.4.9			11.3.25	
Broad condition state	regrowth			lon-remnar			regrowth			Remnant	
Biocondition attribute	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**
Recruitment of woody perennial species (%)		100	5		100	5		100	5		100
Native plant species richness - trees (No.)	5	4	2.5	5	3	2.5	5	3	2.5	4	6
Native plant species richness - shrubs (No.)	10	5	2.5	10	6	2.5	10	6	2.5	2	4
Native plant species richness - grasses (No.)	5	3	2.5	5	2	2.5	5	3	2.5	8	3
Native plant species richness - forbs (No.)	10	3	2.5	10	3	2.5	10	3	2.5	12	6
Tree emergent height (m)	na	0		na	0		na	0		na	0
Tree canopy height (m)	13	0	0	13	1	0	13	4.5	3	23	21
Tree sub-canopy height (m)	8	0	0	8	0	0	8	1.5	0	na	0
Tree height - average			0			0			1.5		
Tree emergent cover (%)	na	0		na	0		na	0		na	0
Tree canopy cover (%)	25	0	0	25	0	0	25	5.1	2	22	36.6
Tree sub-canopy cover (%)	10	0	0	10	0	0	10	0	0	na	0
Tree cover - average			0			0			1		
Native shrub canopy cover (%)	5	20	3	5	6.7	5	5	19.4	3	1	4
Native perennial grass cover (%)	20	1.4	0	20	0	0	20	0.2	0	12	11.4
Organic litter (%)	45	18.8	3	45	18	3	45	6.4	3	15	61
Large trees/ha - total	45	0	0	45	0	0	45	0	0	21	14
Coarse woody debris (m/ha)	1200	20	0	1200	0	0	1200	20	0	375	285
Non-native plant cover (%)	0	15	5	0	70	0	0	40	3	0	15
Maximum site-based score			80			80			80		
Site-based BioCondition score (out of 10)			**3.25**			**2.875**			**3.3125**		

	3			3			3			3			1	
	BC13			BC14			BC15			BC16			BC2	
	11.3.25			11.3.25			11.3.25			11.3.25			11.4.9	
	Remnant			Remnant			Remnant			Remnant			regrowth	
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**
5		80	5		100	5		67	3		83	5		100
5	4	5	5	4	3	2.5	4	6	5	4	6	5	5	2
5	2	3	5	2	7	5	2	3	5	2	4	5	10	10
2.5	8	4	2.5	8	3	2.5	8	5	2.5	8	3	2.5	5	5
2.5	12	4	2.5	12	6	2.5	12	5	2.5	12	3	2.5	10	7
	na	0		na	0		na	0		na	0		na	0
5	23	20	5	23	24	5	23	20	5	23	21	5	13	4
	na	0		na	0		na	0		na	0		8	1.5
5			5			5			5			5		
	na	0		na	0		na	0		na	0		na	0
5	22	38.5	5	22	41.4	5	22	38.7	5	22	30.5	5	25	0
	na	0		na	0		na	0		na	0		10	0
5			5			5			5			5		
3	1	1.5	5	1	12.6	3	1	3.9	3	1	2.1	3	5	25.1
5	12	4.4	1	12	3.4	1	12	5.6	1	12	3	1	20	0
3	15	17	5	15	89	3	15	87	3	15	74	3	45	11
10	21	18	10	21	8	5	21	6	5	21	12	10	45	0
5	375	210	5	375	335	5	375	230	5	375	100	2	1200	0
5	0	15	5	0	30	3	0	15	5	0	5	5	0	20
80			80			80			80			80		
7.625			**7.625**			**5.9375**			**6.25**			**6.75**		

	1			1			1			2			1	
	BC3			BC4			BC5			BC6			BC7	
	11.4.9			11.4.9			11.4.9			11.4.9			11.4.9	
	regrowth			regrowth			regrowth			Non-remnar			regrowth	
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**
5		100	5		100	5		100	5		100	5		100
2.5	5	4	2.5	5	3	2.5	5	2	2.5	5	1	0	5	3
5	10	7	2.5	10	5	2.5	10	10	5	10	7	2.5	10	6
5	5	3	2.5	5	3	2.5	5	5	5	5	5	5	5	4
2.5	10	5	2.5	10	5	2.5	10	6	2.5	10	4	2.5	10	6
	na	0		na	0		na	0		na	0		na	0
3	13	2.5	0	13	4	3	13	3	0	13	0.5	0	13	3
0	8	1.5	0	8	2	3	8	1	0	8	0	0	8	1
1.5			0			3			0			0		
	na	0		na	0		na	0		na	0		na	0
0	25	0	0	25	0	0	25	0	0	25	0	0	25	0
0	10	0	0	10	0	0	10	0	0	10	0	0	10	0
0			0			0			0			0		
3	5	13	3	5	30.4	3	5	27	3	5	1	3	5	11.3
0	20	0.4	0	20	0.6	0	20	0.6	0	20	0.8	0	20	0.6
3	45	32	5	45	15.8	3	45	14	3	45	8.6	3	45	18
0	45	0	0	45	0	0	45	0	0	45	0	0	45	0
0	1200	20	0	1200	35	0	1200	25	0	1200	0	0	1200	50
5	0	15	5	0	15	5	0	15	5	0	65	0	0	40
80			80			80			80			80		
4.0625			**3.5**			**3.625**			**3.875**			**2.625**		

	1			1		
	BC8			BC9		
	11.4.9			11.4.9		
	regrowth			regrowth		
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
5		100	5		100	5
2.5	5	2	2.5	5	2	2.5
2.5	10	6	2.5	10	7	2.5
2.5	5	1	0	5	1	0
2.5	10	4	2.5	10	3	2.5
	na	0		na	0	
0	13	5	3	13	7	3
0	8	1	0	8	2	3
0			1.5			3
	na	0		na	0	
0	25	0	0	25	0	0
0	10	0	0	10	0	0
0			0			0
3	5	29.2	3	5	27	3
0	20	0	0	20	0	0
3	45	3	0	45	6.75	3
0	45	0	0	45	0	0
0	1200	75	0	1200	20	0
3	0	10	5	0	5	5
80			80			80
3			**2.75**			**3.3125**

Inderi BioCondition Survey Site data

Assessmer	3			2			2			2			2	
Site	B1			B2			B3			B4			B6	
Regional ec	11.8.5			11.8.11			11.8.11			11.8.11			11.8.11	
Broad cond	Remnant			lon-Remnar			lon-Remnar			lon-Remnar			lon-Remnar	
Bioconditio	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value
Recruitmer		66	3		0	0		0	0		0	0		0
Native plar	2	3	5	na	0		na	0		na	0		na	0
Native plar	3	3	5	na	0		na	0		na	0		na	0
Native plar	6	7	5	11	5	2.5	11	5	2.5	11	7	2.5	11	6
Native plar	16	8	2.5	17	6	2.5	17	5	2.5	17	4	0	17	7
Tree emerg	na	0		na	0		na	0		na	0		na	0
Tree canop	15	14	5	na	0		na	0		na	0		na	0
Tree sub-ca	5	5	5	na	0		na	0		na	0		na	0
Tree height			5											
Tree emerg	na	0		na	0		na	0		na	0		na	0
Tree canop	13	8.5	5	na	0		na	0		na	0		na	0
Tree sub-ca	3	1	2	na	0		na	0		na	0		na	0
Tree cover			3.5											
Native shru	2	2	5	na	0		na	0		na	0		na	0
Native pere	60	14	1	43	14	1	43	14	1	43	10	1	43	19
Organic litt	25	14	5	13	6	3	13	6	3	13	8	5	13	14
Large trees	6	8	15	na			na			na			na	
Coarse woo	250	75	2	na			na			na			na	
Non-native	0	15	5	0	40	3	0	40	3	0	25	3	0	25
Maximum site-based score			80			30			30			30		
Site-based BioCondition score (ou			**7.75**			**4**			**4**			**3.833333**		

t Unit (AU)	3	2	1
ition Score	6.080357	3.958333	3.888889

	2			2			3			1			3	
	B7			B8			B9			BC1			BC10	
	11.8.11			11.8.11			11.8.5			11.8.11			11.8.5	
	Non-Remnar			Non-Remnar			Remnant			Remnant			Non-remnar	
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**
0		0	0		0	0		100	5		0	0		100
	na	0		na	0		2	2	5	na	0		2	2
	na	0		na	0		3	2	2.5	na	0		3	2
2.5	11	5	2.5	11	5	2.5	6	8	5	11	8	2.5	6	9
2.5	17	6	2.5	17	5	2.5	16	7	2.5	17	3	0	16	5
	na	0		na	0		na	0		na	0		na	0
	na	0		na	0		15	14	5	na	0		15	13
	na	0		na	0		5	6	5	na	0		5	0
									5					
	na	0		na	0		na	0		na	0		na	0
	na	0		na	0		13	26	5	na	0		13	2
	na	0		na	0		3	21	3	na	0		3	2.6
									4					
	na	0		na	0		2	0	0	na	0		2	0
1	43	12	1	43	16	1	60	27	1	43	9.6	1	60	0.4
5	13	7	5	13	10	5	25	14	5	13	10	5	25	2.2
	na			na			6	12	15	na			6	2
	na			na			250	280	5	na			250	50
3	0	15	5	0	15	5	0	20	5	0	25	3	0	60
30			30			30			80			30		
4.666667			**5.333333**			**5.333333**			**7.5**			**3.833333**		

	3			1			1			2			2	
	BC2			BC3			BC4			BC5			BC6	
	11.8.5			11.8.11			11.8.11			11.8.11			11.8.11	
	Remnant			Remnant			Remnant			Non-remnar			Non-remnar	
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**
5		100	5		0	0		0	0		0	0		0
5	2	2	5	na	0		na	0		na	0		na	0
2.5	3	5	5	na	0		na	0		na	0		na	1
5	6	8	5	11	7	2.5	11	6	2.5	11	8	2.5	11	6
2.5	16	5	2.5	17	6	2.5	17	2	0	17	3	0	17	6
	na	0		na	0		na	0		na	0		na	0
5	15	10	3	na	0		na	0		na	0		na	0
0	5	6	5	na	0		na	0		na	0		na	0
2.5			4											
	na	0		na	0		na	0		na	0		na	0
2	13	8	5	na	0		na	0		na	0		na	0
5	3	0	0	na	0		na	0		na	0		na	0
3.5			2.5											
0	2	6	3	na	0		na	0		na	0		na	0
0	60	21.6	1	43	15.4	1	43	2.6	0	43	0.4	0	43	0
0	25	14.8	5	13	7.4	5	13	7.4	5	13	6.4	3	13	6.2
5	6	8	15	na			na			na			na	
2	250	65	2	na			na			na			na	
0	0	30	3	0	15	5	0	70	0	0	65	0	0	65
80			80			30			30			30		
4.125			**7.25**			**5.333333**			**2.5**			**1.833333**		

	3			3			3		
	BC7			BC8			BC9		
	11.8.5			11.8.5			11.8.5		
	Remnant			Remnant			Remnant		
Score	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**	**Benchmark**	**Value**	**Score**
0		66	3		100	5		66	3
	2	3	5	2	2	5	2	3	5
	3	3	5	3	4	5	3	4	5
2.5	6	6	5	6	4	2.5	6	7	5
2.5	16	5	2.5	16	4	2.5	16	5	2.5
	na	0		na	0		na	0	
	15	15	5	15	15	5	15	13	5
	5	6	5	5	7	5	5	7	5
			5			5			5
	na	0		na	0		na	0	
	13	13.3	5	13	0	0	13	13.7	5
	3	2.7	5	3	0.4	2	3	1	2
			5			1			3.5
	2	1.4	5	2	0.2	3	2	0	0
0	60	0.8	0	60	0	0	60	1.8	0
3	25	5	3	25	6.8	3	25	22	5
	6	2	5	6	0	0	6	2	5
	250	30	2	250	10	0	250	220	5
0	0	55	0	0	45	3	0	30	3
30			80			80			80
2.666667			**5.6875**			**4.375**			**5.875**

Appendix D EPBC Offset Calculator

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	ornamental snake
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	ornamental snake	**Area**	167.8	Hectares	
			Quality	**4**	Scale 0-10	
			Total quantum of impact	67.14	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	67.14	Adjusted hectares	Croydon OIA	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	259	**Risk of loss (%) without offset**	9%	**Risk of loss (%) with offset**	0%	23.31	85%	19.81	19.04	67.27	100.19%	Yes	
									Future area without offset (adjusted hectares)	235.7	**Future area with offset (adjusted hectares)**	259.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**2**	**Future quality with offset (scale of 0-10)**	**5**	3.00	85%	2.55	2.45				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	67.136	67.27	100.19%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	squatter pigeon
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes	squatter pigeon	**Area**	83.53	Hectares	
			Quality	**5**	Scale 0-10	
			Total quantum of impact	41.77	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	41.77	Adjusted hectares	Croydon OIA	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	246.5	**Risk of loss (%) without offset**	5%	**Risk of loss (%) with offset**	0%	12.33	85%	10.48	10.07	45.30	108.46%	Yes	
									Future area without offset (adjusted hectares)	234.2	**Future area with offset (adjusted hectares)**	246.5								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	6	**Future quality without offset (scale of 0-10)**	**5**	**Future quality with offset (scale of 0-10)**	**7**	2.00	85%	1.70	1.63				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	41.765	45.30	108.46%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

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

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

Impact calculator

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	23.4	Hectares	
			Quality	**3**	Scale 0-10	
			Total quantum of impact	7.02	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	7.02	Adjusted hectares	Inderi OIA	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	33	**Risk of loss (%) without offset**	5%	**Risk of loss (%) with offset**	0%	1.65	85%	1.40	1.10	7.07	100.72%	Yes	
									Future area without offset (adjusted hectares)	31.4	**Future area with offset (adjusted hectares)**	33.0								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**5**	**Future quality without offset (scale of 0-10)**	**4**	**Future quality with offset (scale of 0-10)**	**7**	3.00	85%	2.55	2.01				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	7.02	7.07	100.72%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Appendix E MSES Land-based Multiplier and Combined Offset Calculators

COMBINED OFFSET DELIVERY CALCULATOR

For instructions on using this calculator please scroll down

PLEASE ENTER DATA ASDIRECTED IN THE FIELDS BELOW						RESULTS (THESE FIELDS ARE AUTOPOPULATED)			
Matter Number	Select Matter Type	Enter Matter Description	Enter Significant Residual Impact Area per Matter (ha)	Enter Matter Multiplier	Enter the Total Extent of Area on Proposed Offset Site That Meets Requirements For Impacted Matter	Total Offset Obligation per Impacted Matter (ha)	Total % of Offset Obligation met on Proposed Offset Site	Total proportion of Significant Residual Impact Area per Matter Acquitted via Offset Site (ha)	Total Remaining Significant Residual Impact Area to be Offset through the Financial Calculator per Impacted Matter (ha)
1	Of Concern Regional ecosystems	RE 11.8.11 non remnant	23.4	1.45	34	33.93	100.00%	23.40	0.00
2									
3									
4									
5									
6									
7									
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9									
10									
11									
12									
13									
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49									
50									

TOTAL	23.40	0.00
	Total Hectares of Impact Area Offset via Offset Site	Total Hectares of Impact Area Still Required to be Offset via a Financial Payment

INSTRUCTIONS

1. Select the matter type for each matter you are impacting (Column E).

2. Enter the description for each matter type selected (Column F/G).

3. Enter the significant residual impact area for each matter type selected (Column H).

4. Enter the multiplier for the matter type selected. (Column I)

5. Enter the total extent of area on proposed offset site that meets requirements for impacted matter (Column J).

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Land-based Offsets Multiplier Calculator (for standard proponent driven offset assessments involving a comparison of an impact site and a proposed offset site)

1 - Remnant Offsets

ERROR: PREDICTED GAIN DOES NOT ACHIEVE CONSERVATION OUTCOME - REFER TO HABITAT QUALITY GUIDELINE

SELECT BIOREGION	SELECT BVG	Description	Enter Impact Habitat Quality	Enter Offset Habitat Quality	Maximum Possible Gain	Enter Predicted Gain over 20yrs	Required Multiplier
Brigalow Belt	BRB_13	TUSSOCK GRASSLANDS, FORBLANDS			10		

2 - Regrowth Offsets

SELECT BIOREGION	SELECT BVG	Description	Enter Impact Habitat Quality	Enter Offset Habitat Quality	Maximum Possible Gain	Enter Predicted Gain over 20yrs	Required Multiplier
Brigalow Belt	BRB_13	TUSSOCK GRASSLANDS, FORBLANDS	3	4	6	2	1.45

Note: For further information on Habitat quality please consult the Guide to determining terrestrial habitat quality located on the Queensland Government website that can be accessed via the link below.

Queensland Environmental Offsets Website

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Instructions for Use

1 - Choose the type of community you are offseting in.

2 - For remnant communities use the remnant calculator and for regrowth communities use the regrowth calculator

3 - Select the applicable bioregion from the drop-down list provided

4 - Select the applicable Broad Vegetation Group (BVG) from the drop-down list provided (refer to the <tblu_RE> sheet, column - BVG_521M)

5 - Select your impact area habitat quality score from the drop-down list provided

6 - Select your offset area habitat quality score from the drop-down list provided

7 - Enter predicted gain over 20yrs from the drop-down list provided. Note predicted gain cannot exceed maximum possible gain.
(Please Note: Any predicted gain greater than 2 points will need to be justified in your application and demonstrated via additional management actions)

8 - Click the button provided to update the required multiplier field.