Wackett South Ecology Assessment Report

Santos Limited

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DOCUMENT TRACKING

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Project Manager	Jessie McCudden
Prepared by	Matt Dale and Ella Horton
Reviewed by	Jessie McCudden
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Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DESI	Department of Environment, Science and Innovation
DotE	Department of the Environment
EA	Environmental Authority
ELA	Eco Logical Australia
EVNT	Endangered, Vulnerable or Near Threatened
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Areas
NC Act	*Nature Conservation Act 1992*
PMST	Protected Matters Search Tool
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SLC	Special Least Concern
VM Act	*Vegetation Management Act 1999*

1. Introduction

1.1. Project background

Santos Limited (Santos) are proposing to construct and install approximately 4 km of pipeline, identified as the Wackett-2 and Wackett-14 flowlines (the Project), located approximately 20 km south-east of Ballera in south-west Queensland. Santos require an understanding of the environmental constraints present within the Project area.

1.2. Objectives and scope of work

The objective of this assessment is to validate the ecological values within the study area using both desktop and field verified data.

Specifically, the scope of works included:

- Ground-truth Regional Ecosystem (RE) type and condition as per the Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 6.0. (Neldner, 2022)
- Undertake BioCondition assessments in accordance with the Queensland Government's BioCondition, a condition assessment framework for terrestrial biodiversity in Queensland assessment manual (Eyre et. Al., 2015) (BioCondition Manual).
- Validate threatened species habitat values, particularly species protected under the Queensland *Nature Conservation Act 1992* (NC Act).
- Identify and map Matters and State Environmental Significance (MSES) within the study area
- Significant impact assessment.
- Providing avoidance, mitigation, and management strategies to reduce the severity, and magnitude of potential impacts.

1.3. Description of study area and impact area

The study area is defined as the Wackett-2 and Wackett-14 flowlines (approximately 4 km combined length) which comprise a 100 m wide right of way (herein referred to as 'the study area') (Figure 1). The study area occupies an area of 33.27 ha.

The proposed impact area is a 19 m wide right of way and several additional work areas (AWAs) that comprise a total area of 7.19 ha (Figure 1). The impact area has been deliberately located within the existing historical disturbance associated with the Wackett South 1 Gas Flowline to the greatest extent possible. The exact location of the impact area may be refined, however, the proposed estimate of clearing is considered an upper limit.

The study area is located in the Channel Country bioregion, within the Cooper – Diamantina Plains subregion. This area is arid and has unpredictable rainfall which can flood the plains, inundating vegetation. Within the study area, vegetation is dominated by open shrubland and open herbland comprising of *Chenopodium auricomum* (Queensland bluebush) and *Eragrostis setifolia* (Bristly love grass). The study area contains some disturbance such as access tracks, cleared paths, and existing Santos' infrastructure.

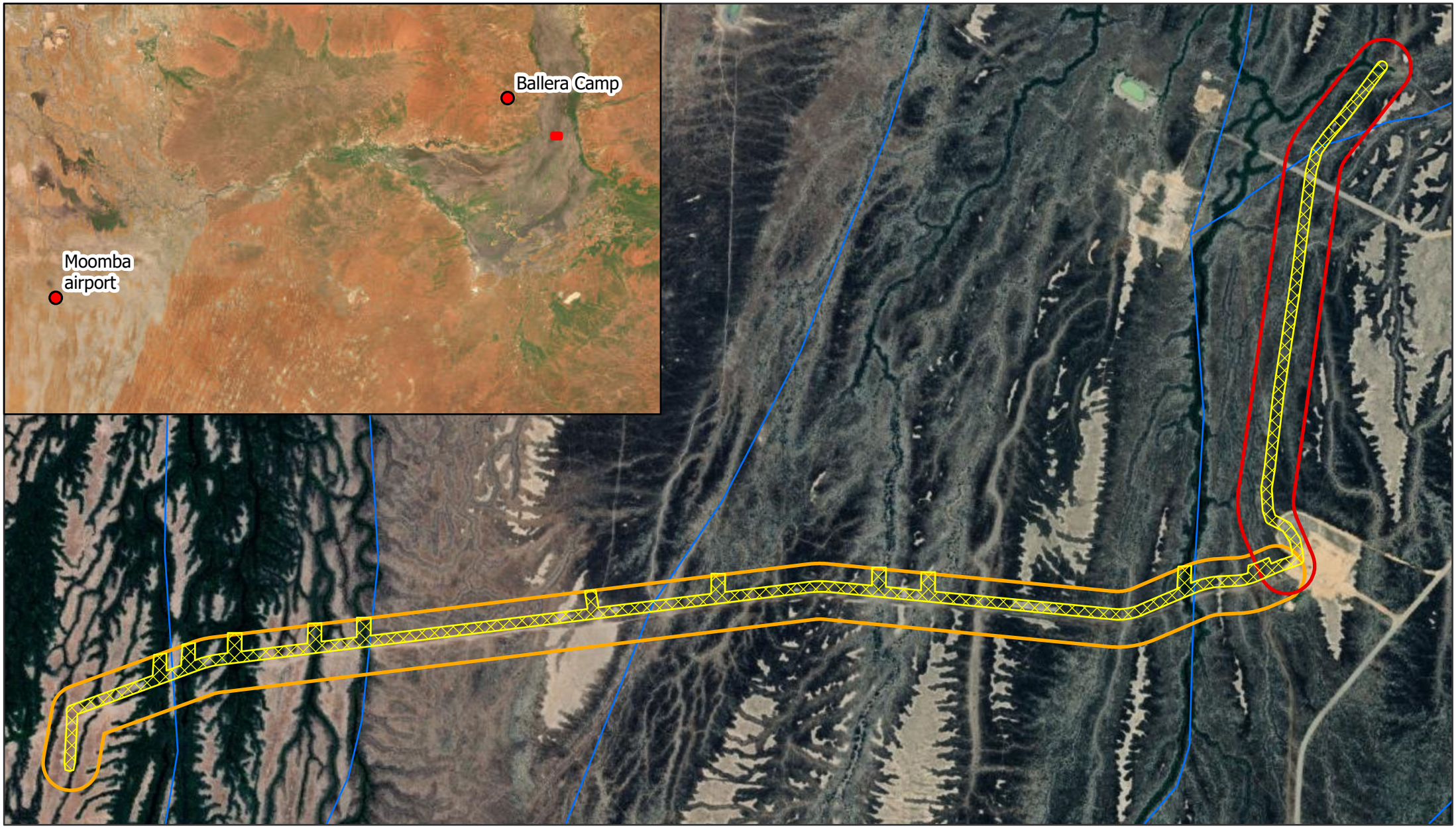

Figure 1: Study area

Wackett 14 re-direction Flowline Study area

Wackett South 2 Flowline Study area

Impact area

VM Act watercourses (v7.00)

0 85 170 340

Metres

Datum/Projection:
GDA2020 MGA Zone 54
Project: 5153-MD Date: 9/18/2024

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2. Method

2.1. Desktop assessment

A desktop assessment was undertaken to review existing data and to identify the presence of Commonwealth and State listed ecological values occurring within the study area. The desktop assessment involved a review of environmental databases, maps, literature, and digital datasets. Results were used to compile a likelihood of occurrence assessment of potentially occurring threatened and/or migratory flora and fauna species within the study area.

2.1.1. Database searches

The following databases were reviewed to assess the potential for ecological values to occur within the study area:

- Protected Matters Search Tool (PMST) Report (central coordinate -27.5229664, 141.9915788; 100 km buffer).
- WildNet database (central coordinate -27.5229664, 141.9915788; 100 km buffer).
- RE mapping (version 13).
- Queensland geological digital data (Queensland Globe).
- Land systems mapping.
- Department of Environment and Science (DES) Environmentally Sensitive Areas (ESA) map.
- Protected Plant Flora Survey Trigger mapping (version 10).
- Map of Queensland wetland environmental values.
- *Vegetation Management Act 1999* (VM Act) watercourse data.
- VM Act wetland data.
- MSES mapping.
- Atlas of Living Australia (ALA) species records.
- Approved Conservation Advice, National Recovery Plans and Survey Guidelines for significant species occurring within the study area.
- Santos aerial imagery (Santos, 2020).

A copy of the PMST report, Wildlife Online report, DESI RE report, DESI ESA map and Flora trigger map are provided in Appendix A.

2.1.2. Likelihood of occurrence assessment

Database searches identified species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and / or the NC Act that have the potential to occur within the study area and surrounding region. The likelihood of occurrence assessment for these values were reviewed and updated at the conclusion of the field survey to reflect the survey results.

These updates were associated with:

- changing the assessment of likelihood to 'known' if a species was found to be present during the field surveys; or
- reducing the likelihood of occurrence, based on an absence of habitat within the study area.

The likelihood score was not downgraded in response to a failure to detect a species during field surveys when habitat suitable for the species was identified within the study area. This approach accommodates natural changes in the distribution and abundance of species over time and was applied in acknowledgement of the limitations of field sampling methods (e.g. lack of targeted searches) and survey conditions, which may not capture all target species present at the time of sampling.

Likelihood assessments were based on the known distribution and preferred habitat of the species and the identification of these habitat values during field surveys. The criteria used to assess the likelihood of species occurring within the study area is presented in Table 1. The results of the assessment are presented in Appendix B.

Table 1: Likelihood assessment criteria of occurrence within study area

Likelihood	Description
Known	The species was positively identified and recorded in the study area during the field assessment; previous records of occurrence within the study area.
Likely	The species was not recorded during the field survey or previously, however there are known records within the nearby surrounding area and suitable habitat exists on site.
Potential	The species was not recorded during the field survey or previously, however known records occur within the surrounding area and habitat in the study area is marginal or may provide some suitability at some point during the species lifecycle.
Unlikely	Habitat in the study area might be suitable or marginal; however, the species was not recorded during the field survey, and no known records of the species exist within the surrounding area (100 km), or the study area occurs outside the species current known range.

2.2. Field survey

A field survey was undertaken by two suitably qualified ecologists on 12 – 14 December 2023. Detailed field survey methods are provided in the sections below.

2.2.1. Quaternary surveys

Quaternary surveys were undertaken to validate the extent, classification, and condition of vegetation communities within the study area (Figure 2). Quaternary surveys were undertaken in accordance with Neldner et al. (2020). At each survey point, the following information was recorded:

- RE classification.
- Vegetation condition (remnant, high-value regrowth, regrowth, non-remnant).
- Dominant species at each structure level (emergent, T1, T2, T3, S1, S2, ground).
- Ecologically dominant layer height (m) and cover (%).

2.2.2. Tertiary surveys

Tertiary surveys were used to identify vegetation communities and REs across the project area by capturing data on the condition and species composition (Figure 2). Tertiary surveys were undertaken in accordance with the 'Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland' (Neldner et al., 2022). At each survey point, the following information was recorded:

- RE classification.
- Vegetation condition (remnant, high-value regrowth, regrowth, non-remnant).

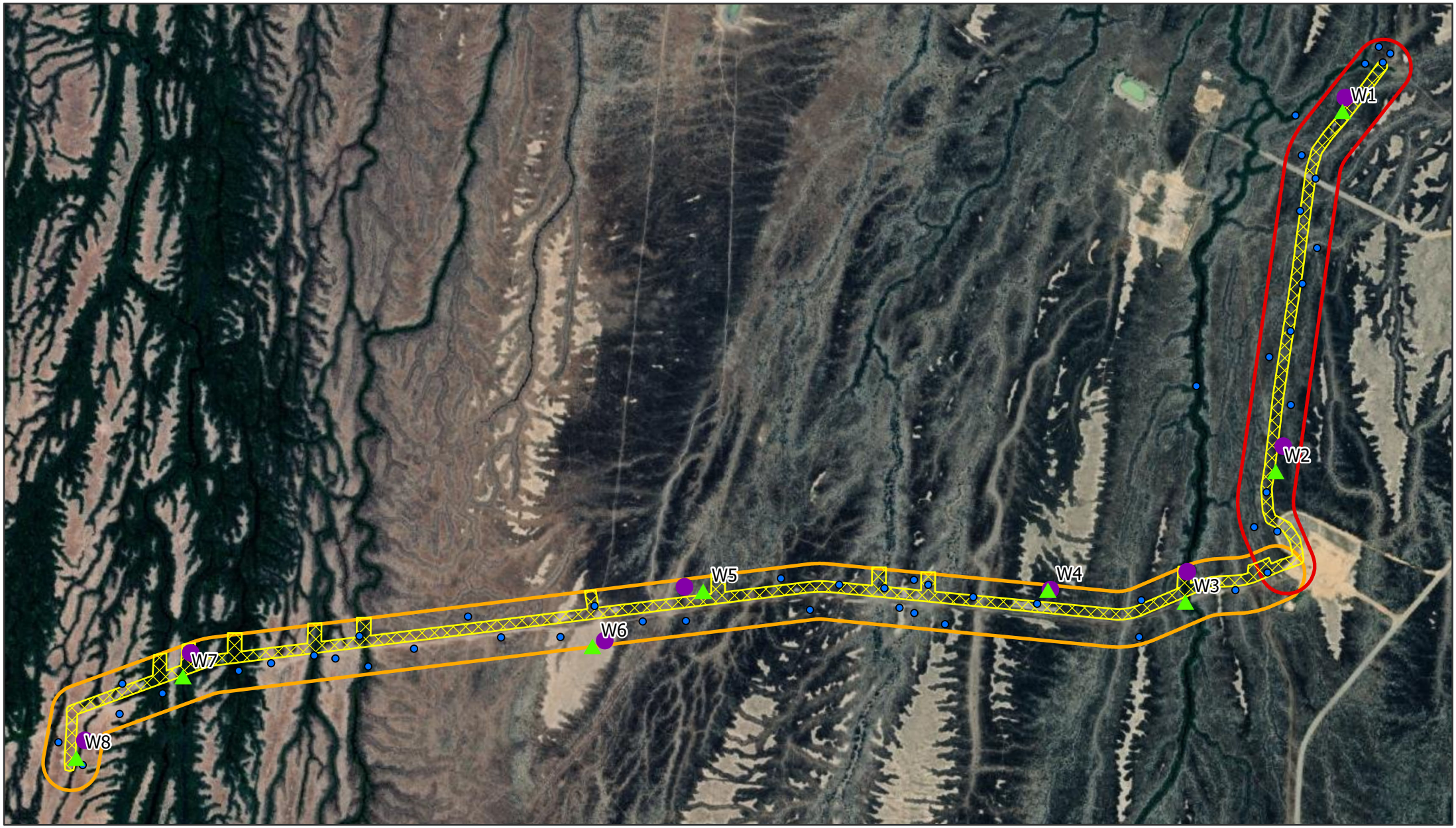

Figure 2: Flora survey sites

- Wackett 14 re-direction Flowline Study area
- Wackett South 2 Flowline Study area
- Impact area
- BioCondition assessment
- Tertiary assessment
- Quaternary assessment

0 85 170 340
Metres

Datum/Projection:
GDA2020 MGA Zone 54
Project: 5153-MD Date: 9/18/2024

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- dominant, co-dominant, sub-dominant and associated species, as well as average height and cover at each structure level (emergent, T1, T2, T3, S1, S2, ground).
- ecologically dominant layer (emergent, T1, T2, T3, S1, S2, ground).
- structure (dense, mid-dense, sparse, very sparse).
- Landform.
- slope class and degree.
- soil texture and colour.
- evidence of disturbance (for example weeds, clearing, grazing or fire) and erosion.

RE classification was determined based on the vegetation, soil and landform characteristics identified in the field, geological mapping for the region and the Regional Ecosystem Description Database (REDD). Condition status for woody vegetation was evaluated using the definitions of remnant vegetation under the VM Act.

2.2.3. Threatened species habitat assessment

Habitat suitability assessments were undertaken to quantify the presence or absence and extent of threatened species habitat within the study area for species identified as potentially occurring in the desktop assessment (Table 7).

Habitat assessments conducted for threatened species were derived from available literature (including the SPRAT Database), relevant government documents and published research papers) and vegetation assessments conducted in the field.

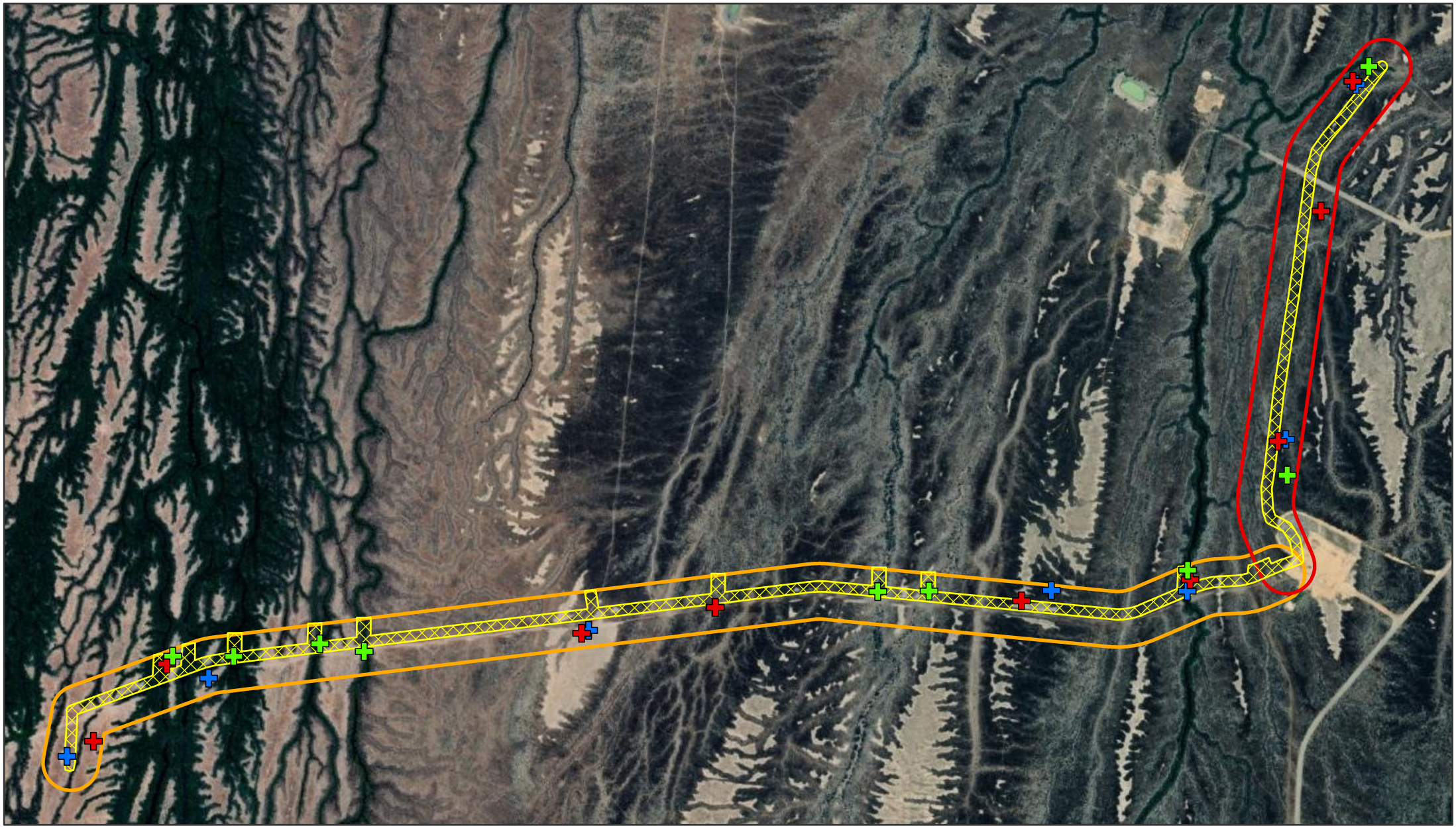

Figure 3: Fauna survey sites

- Wackett 14 re-direction Flowline Study area
- Wackett South 2 Flowline Study area
- Impact area
- Plains wanderer habitat assessment
- Grey falcon habitat assessment
- Grey grasswren habitat assessment

0 85 170 340
Metres

Datum/Projection:
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2.2.4. BioCondition assessment

BioCondition assessments were undertaken in accordance with the BioCondition manual in representative locations within each identified vegetation community. Vegetation within the study area was allocated into three assessment units, associated with the three REs. The number and location of BioCondition assessment sites undertaken within the assessment unit was determined based on the methods described in the BioCondition manual (Eyre et al., 2015).

BioCondition assessment includes collection of the following ten site-based attributes within a 100 m x 50 m (0.5 ha) nested sampling plot:

- Recruitment of woody perennial species.
- Native species richness (tree, shrub, forb, grass).
- Tree canopy height.
- Tree canopy cover.
- Shrub canopy cover.
- Native perennial grass cover.
- Organic litter cover.
- Number of large trees.
- Coarse woody debris abundance.
- Non-native plant cover.

Four photographs were taken from the centre of each BioCondition plot in the cardinal directions (north, east, south, and west).

The second component of the BioCondition assessment method is a post-field desktop analysis to assess landscape-scale attributes. In intact landscapes, which include the arid and semi-arid rangelands across the western parts of QLD (location of the study area), distance from permanent water is measured to derive a landscape-scale attribute score.

The BioCondition score for each assessment site was calculated by adding the scores for each site-based and landscape-scale attribute and dividing by the maximum possible score for the RE (e.g., 65 for shrubland REs and 50 for grassland REs), in accordance with the BioCondition manual.

BioCondition benchmarks were requested from the Queensland Herbarium. When available benchmarks were used for each respect RE, except for 5.3.18b as no benchmark was available. RE 5.3.19 was used as an appropriate benchmark following advice from the Queensland Herbarium.

2.3. Data analysis

2.3.1. Data collection

ArcCollector and Form Connect were used to collect field data, using iPads.

2.3.2. GIS analysis

Spatial data collected during the field survey were imported into ArcGIS Pro. Vegetation and habitat boundaries were validated and re-defined where necessary, and final ground-truthed mapping was produced.

Field survey sites were used to verify vegetation to aid aerial photographic interpretation (API). The final mapped product is considered accurate at a 1:10,000 scale. The fine scale nature of the available imagery and supporting site survey data allowed for the identification of REs across the landscape based on landscape position, visual signature (texture, pattern, and colour) and structure.

As per Neldner et. al. (2022), spatial and attribute accuracy was assigned based on the following the details provided in Table 2.

Table 2: Confidence rates for RE spatial and attribute

Attribute	Confidence rating
Spatial accuracy of boundaries	A = high confidence in accuracy of polygon boundary B = moderate confidence in accuracy of polygon boundary C = low confidence in accuracy of polygon boundary
Attribute accuracy	A = high confidence in accuracy of polygon attribute B = moderate confidence in accuracy of polygon attribute C = low confidence in accuracy of polygon attribute

2.3.3. BioCondition scoring

Eco Logical Australia (ELA) has developed BioCondition calculation sheets, which follow the methods in the BioCondition Manual (Eyre, et al., 2015), for efficient workflow. Data captured in the field is used to automatically populate these sheets and calculate the BioCondition scores and classes.

2.4. Limitations

The local conditions at the site were found to be dry. This is expected to have resulted in lower scores for some BioCondition attributes (i.e. grass and forb species richness).

Due to the natural boom/bust cycle of the arid environment the drought conditions observed during field investigations have impacted the ability to identify some forb and grass species.

3. Results

3.1. Survey conditions

Weather conditions in the week leading up to the survey was characterised by hot dry days and warm dry nights (BoM, 2023) (Table 3). The study area received 0.02 mm of rain in the week preceding the field survey. Climate data was obtained from recordings a Ballera, Queensland, located approximately 20 km northwest of the study area.

Table 3: Weather conditions preceding and during the field survey (12 - 14 December 2023)

Date	Temperature		Total rainfall (mm)	Max wind speed (km/h)
	Minimum (˚C)	Maximum (˚C)		
Nov 2023	22.8°C	37.5°C	9.0 mm	65 km/h
12 Dec 2023	22.3°C	37.2°C	0 mm	37 km/h
13 Dec 2023	26.0°C	38.0°C	0 mm	59 km/h
14 Dec 2023	28.1°C	41.2°C	0 mm	46 mm

3.2. Regional ecosystems

The study area is mapped by the Department of Environment, Science and Innovation (DESI) as remnant REs with a Biodiversity Status of no concern at present. The study area comprises mixed polygons of RE 5.3.13a, 5.3.18a and 5.3.18b.

Following the field survey, the RE mapping was refined to delineate REs into homogenous polygons (Figure 4). Three distinct REs (5.3.13a, 5.3.18a, and 5.3.18b) were identified, all in remnant condition. Two small non-remnant areas were identified.

Table 4 describes the REs observed, including the field description, condition, biodiversity status and extent within the study area.

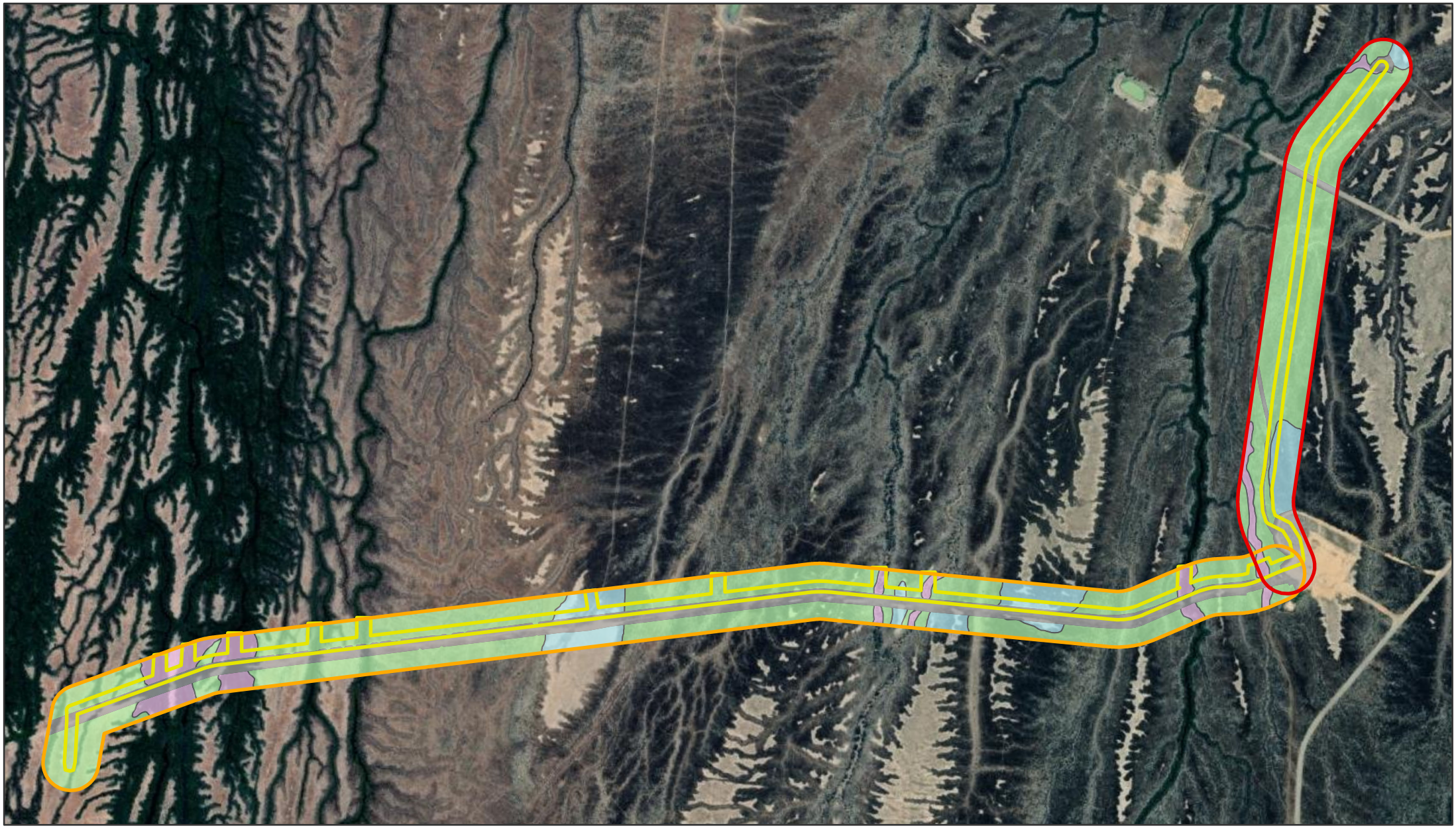

Figure 4: Ground-truthed Regional Ecosystems

- Wackett 14 re-direction Flowline Study area
- Wackett South 2 Flowline Study area
- Impact area

Regional Ecosystem (condition)

- 5.3.13a (remnant)
- 5.3.18a (remnant)
- 5.3.18b (remnant)
- Non-remnant

0 85 170 340

Metres

Datum/Projection:
GDA2020 MGA Zone 54
Project: 5153-MD Date: 9/18/2024

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Table 4: Ground truthed REs

RE	Short Description	VM Act Class	BD Status	Study Area (ha)	Impact area (ha)	Field description and representative photo
5.3.13a	*Duma florulenta* open shrubland in depressions on flood plains, interdune flats, clay pans and clay plains	LC	NC	2.48	0.83	Open shrubland dominated by *Acacia stenophylla, Chenopodium auricomum* and *Duma florulenta.* Ground cover dominated by *Eragrostis setifolia, Marsilea drummondii* and *Alternanthera nodiflora.* 
5.3.18a	Braided channel complex of major alluvial plains. *Chenopodium auricomum* open shrubland with scattered *Eucalyptus coolabah* low trees and *Eremophila bignoniiflora* tall shrubs.	LC	NC	22.04	4.40	Open shrubland dominated by *Chenopodium auricomum.* Ground cover dominanted by *Erogrostis setifolia, Atriplex velutinella, Portulaca oleracea,* and *Senecio depressicola.* 

RE	Short Description	VM Act Class	BD Status	Study Area (ha)	Impact area (ha)	Field description and representative photo	
5.3.18b	Braided channel complex of major alluvial plains, includes *Chenopodium auricomum* open shrubland and variable sparse to open-herbland	LC	NC	3.02	0.59	Open herbland dominated by *Atriplex velutinella*. Other species present include *Alternanthera nodiflora, Chenopodium auricomum, Marsilea drummondii,* and *Portulaca oleracea.*	
-	Non-remnant	-	-	5.73	1.38	Existing disturbance such as cleared areas, access tracks and existing Santos infrastructure.	

3.3. BioCondition assessment results

Eight BioCondition assessments were undertaken in representative locations within the study area. The location of each BioCondition site within the study area is provided in Figure 2 and site photos, BioCondition scores and a full species list are presented in Appendix C, Appendix D and Appendix E.

The mean BioCondition score for the REs generally reflects the moderate condition of vegetation within the study area. A BioCondition score of 0.8 – 1 represents vegetation communities in 'functional biodiversity condition' which is equivalent to remnant or undisturbed examples of these communities. BioCondition scores of 0.6 – 0.79 are representative of communities that are in good condition but are less 'functional' due to disturbance altering some characteristics of the community. A score of 0.4 – 0.59 represents vegetation that are in poor condition. For the REs present within the study area, seasonal conditions can account for a wide variation of BioCondition scoring. BioCondition benchmarks for the channel country bioregion are currently being reviewed by the Queensland Herbarium as more data for the region becomes available. In the interim, draft benchmarks have either been provided by the Queensland Herbarium or determined from ELA data on file and Queensland Herbarium technical descriptions, as advised by the Herbarium.

Average BioCondition scores for all assessment units indicate the study area is in an overall good condition and 'functional' with small areas of disturbance altering some characteristics of the community (Table 5).

The open shrubland vegetation communities (5.3.13a and 5.3.18a) are characteristically sparse with overall low species richness. RE 5.3.13a (average BioCondition score of 0.85) and RE 5.3.18a (average BioCondition score of 0.83) were in functional condition. The open herbland vegetation community (5.3.18b) has lower species richness than the benchmark. This community was considered in moderate condition (average BioCondition score of 0.77).

Table 5: Summary of BioCondition assessment results

Assessment unit	BioCondition Site	RE	Condition	Benchmark used	Study Area (ha)	Mean score for assessment unit
AU1	W3, W7	5.3.13a	Remnant	5.3.13a	2.48	0.85
AU2	W1, W5, W8	5.3.18a	Remnant	5.3.18a	22.04	0.83
AU3	W2, W4, W6	5.3.18b	Remnant	5.3.19	3.02	0.77

A full species list for BioCondition sites is provided in Appendix E.

3.4. Habitat types

Three distinct habitat types were identified that provide habitat for least concern species and species that are listed as endangered, vulnerable or near threatened (EVNT) or special least concern (SLC) under the NC Act or threatened under the EPBC Act. The broad habitat types and associated description details are provided in Table 6.

Table 6: Broad habitat types

Habitat type	Associated REs	Study Area (ha)	Impact area (ha)	Field Description and associated values	Representative photos
Open shrubland in depressions on flood plains	5.3.13a	2.48	0.83	This habitat type occurs in depressions on flood plains and is dominated by *Duma florulenta* with *Chenopodium auricomum* and occasional low trees and tall shrubs including *Acacia stenophylla*. Ground layer is sparse and dominant species vary by season. The Grey grasswren was observed within this habitat during field surveys. This habitat type is suitable foraging and breeding habitat. Threatened species considered to potentially occur within the study are and within this habitat type include foraging habitat for Grey falcon and Plains wanderer.	
Braided channel complex of major alluvial plains.	5.3.18a	22.04	4.40	This habitat type occurs on frequently flooded alluvial plains with shallow braided stream channels. Vegetation is dominated by *Chenopodium auricomum.* The ground layer was sparse however, is seasonally dominated by grasses, sedges, and forbs. Ground layer species found at the site included *Eragrostis setifolia, Atriplex velutinella, Portulaca oleracea* and *Senecio depressicola.* Soils are often very deep, crusted, and grey cracking clays that are subject to scalding. Threatened species considered to potentially occur within the study are and within this habitat type include foraging habitat for Grey falcon and Plains wanderer.	

Habitat type	Associated REs	Study Area (ha)	Impact area (ha)	Field Description and associated values	Representative photos
Variable herbland on alluvial plains	5.3.18b	3.02	0.59	This habitat type occurs on braided channel systems on alluvial plains of major rivers and consists of open herbland dominated by *Atriplex velutinella.* Other common species include *Alternanthera nodiflora, Chenopodium auricomum, Marsilea drummondii,* and *Portulaca oleracea.* Soils are often very deep, crusted, and grey cracking clays that are subject to scalding. Threatened species considered to potentially occur within the study are and within this habitat type include foraging habitat for Grey falcon and Plains wanderer.	

3.5. Threatened species records and habitat

Several threatened species are known or potential occurrences within the study area (Table 7, Figure 5 and Figure 6).

Table 7: Threatened species known, likely or potentially occuring within study area

Scientific name	Common name	EPBC Act	NC Act	RE	Impact area (ha)	Likelihood of occurrence	Description of habitat within study area
Amytornis barbatus	Grey grass wren	E	E	5.3.13a & 5.3.18a	5.23	Known	This species was observed on site by the survey team. Numerous individuals were seen inhabiting lignum within a dried water channel.
Aphelocephala leucopsis	Southern whiteface	V	V	5.3.13a & 5.3.18a	5.23	Potential	Potential occurrence within study area. Suitable habitat present included grass plains with drought-resistant species. However, no individuals were observed on site.
Pedionomus torquatus	Plains wanderer	CR	CE	5.3.18a & 5.3.18b	4.99	Potential	Rare occurrence within study area. Sparse suitable foraging and breeding habitat. No observations made.
Falco hypoleucos	Grey falcon	V	V	5.3.13a, 5.3.18a & 5.3.18b	5.82	Potential	Rare occurrence within study area. Sparse suitable foraging and breeding habitat. No observations made.
Neophema chrysostoma	Blue-winged parrot	V	V	5.3.13a & 5.3.18a	5.23	Potential	Potential occurrence within study area. Suitable habitat present included grass plains with drought-resistant species. However, no individuals were observed on site.

3.5.1. Grey grasswren

Amytornis barbatus (Grey grasswren) is listed as endangered under both the EPBC Act and NC Act. Grey grasswren is a small bird (18-20cm) and weighs between 15.5-21.5 g (Hardy, 2002). It is elusive, often quiet and thought to be relatively sedentary (Department of Climate Change, Energy, Environment and Water [DCCEEW], 2023). The species has been observed to exhibit extreme fluctuations in areas of occupancy in response to drought, with the bird congregating to the refuge of the denser lignum stands (Hardy, 2002).

Core habitat for the species is limited to communities dominated by either lignum and/or swamp canegrass, where the species will nest and seek refuge during times of drought. Areas fringing these communities, when dominated by either Queensland bluebush and/or *Atriplex nummularia* old man saltbush), provide supporting habitat for the species. The bird is known to forage within old man saltbush and may move into adjacent shrublands during times when core habitat is inundated. These areas include Queensland bluebush-dominated community RE 5.3.18a, and *Eucalyptus coolabah* (coolibah) with *Acacia stenophylla* (river coobah) where lignum is present in the shrub layer, analogous to RE 5.3.8. The species is not associated with treed communities, where coolibah is extensive (ELA, 2021).

Breeding is thought to occur in July and August, with some instances observed to October, and territory size for breeding pairs or groups is thought to be around 200m^2 (DotE, 2014; Farrel et al., 2018). The species typically nests in lignum but often forages in surrounding swamp canegrass, constructing a semi domed nest made of grass, lined with soft grass, downy plant seeds or feathers (DCCEEW, 2023; DotE, 2014). The nest, which has a large opening in one side, is placed close to the ground in a clump of lignum or swamp canegrass, often raised 0.3 m or more above the ground and generally orientated towards the outside of the thicket (DCCEEW, 2023). The nesting period, although unknown, is likely to be about 12 to 14 days in length. The young accompany their parents for several weeks (and sometimes possibly for several months) after departing the nest (DCCEEW, 2023).

Four Grey grasswren individuals were recorded at two locations within the study area in thick lignum along dry watercourses, identified as remnant RE 5.3.13a (Figure 5). This habitat is characterised by lignum dominated swamp, comprising a network of channels densely lined by lignum, bands of lignum along channels or extensive areas of reticulated swamps. This RE is considered core habitat for Grey Grasswren (ELA, 2021). Additional suitable habitat for the species within the study area was identified as RE 5.3.18a. RE 5.3.18a includes patches of lower set Queensland bluebush (Chenopodium auricomum) shrubland. This RE is categorised as supporting habitat for Grey grasswren and is often found adjacent to core habitat (ELA, 2021). Lignum is usually found scattered throughout this RE but is not dominant. Grey grasswren may utilise these areas during wet periods, however, would likely congregate back into core habitat during periods of climatic extremes.

RE 5.3.18b is also mapped within the study area, however, this RE is categorised as unsuitable habitat for Grey grasswren due to being vast areas of open variable forblands that do not contain a shrub layer. These areas are absent of lignum, swamp canegrasss or Queensland bluebush which are all core habitat for Grey grasswren (ELA, 2021).

The Grey Grasswren records are located both north and south of the existing pipeline disturbance within the study area, indicating that the existing disturbance has not limited connectivity of Grey grasswren habitat in the local region.

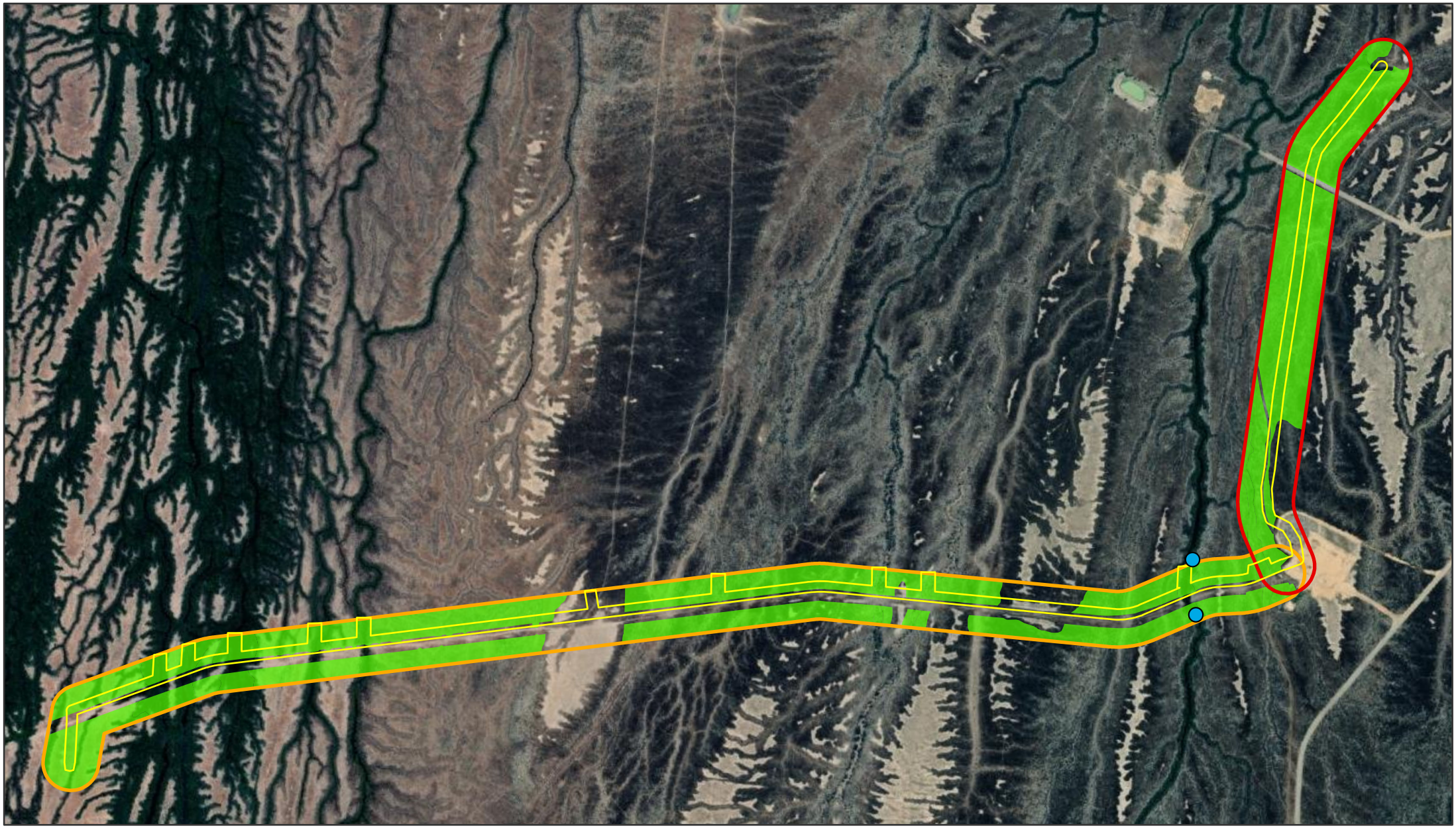

Figure 5: Grey grasswren, Southern whiteface & Blue-winged parrot habitat

Wackett 14 re-direction Flowline Study area
Wackett South 2 Flowline Study area
Impact area
Grey grasswren, Southern whiteface & Blue-winged parrot habitat
Grey grasswren records (two individuals recorded at each location)

0 85 170 340
Metres

Datum/Projection:
GDA2020 MGA Zone 54
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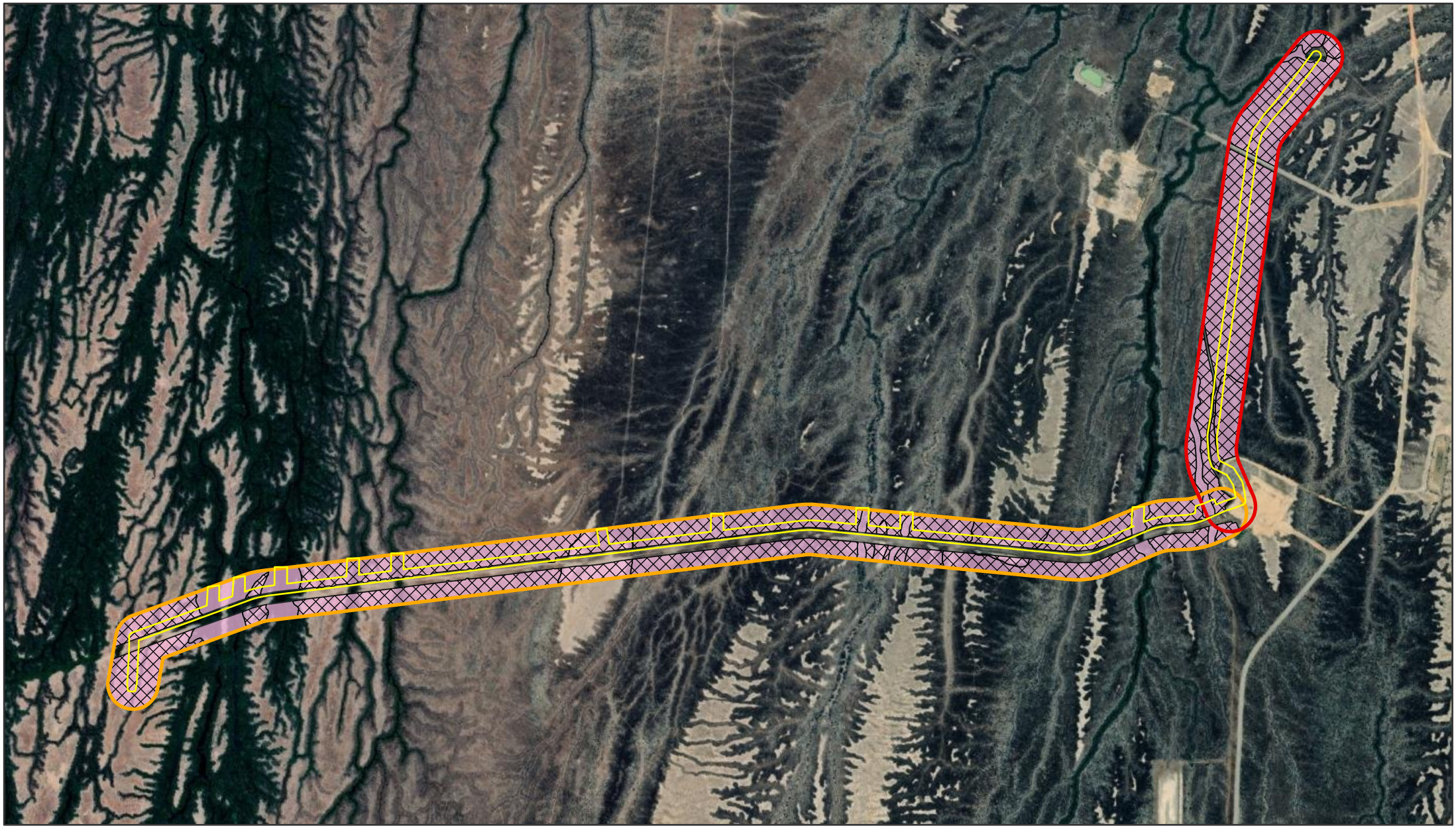

Figure 6: Grey falcon and Plains wanderer habitat

3.6. MSES

MSES, as defined in Schedule 2 of the EO Regulation, were assessed within the impact area (Table 8).

Table 8: MSES presence within impact area

MSES	Presence within study area
Regulated vegetation[1] Prescribed regional ecosystems that are endangered regional ecosystems. Prescribed regional ecosystems that are of concern regional ecosystems. Prescribed regional ecosystems that: • intersect with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection); or • an area of essential habitat on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife. A prescribed regional ecosystem to the extent that the ecosystem is located within a defined distance from the defining banks of a relevant watercourse.	Present as 2.73 ha of prescribed REs that are located within a defined distance from the defining banks of a relevant watercourse (stream order 8).
Connectivity areas	Present as 5.82 ha of remnant vegetation.
Wetlands and watercourses A wetland: • in a wetland protection area (WPA); or • of high ecological significance (HES) shown on the map of Queensland wetland environmental values; • a wetland or watercourse in high ecological value waters.	Not present
Designated precinct in a strategic environmental area	Not present
Protected wildlife habitat	Present as suitable habitat (5 and Figure 6) for: • Grey grasswren • Southern whiteface • Plains wanderer • Grey falcon • Blue-winged parrot.
Protected areas	Not present
Highly protected zones of State marine parks	Not present
Fish habitat areas	Not present
Waterway providing for fish passage	Not present
Marine plants	Not present
Legally secured offset areas	Not present
Designated precinct in a strategic environmental area	Not present

[1]Definition of prescribed RE is in the EO Regulation and does not include regrowth vegetation

4. Potential impacts, avoidance and mitigation measures

4.1. Potential project impacts

Activities associated with the Project have the potential to impact MSES, both directly and indirectly, during the construction and operation phases. Direct and indirect impacts associated with the construction and operational phases of the Project include:

- Loss of habitat through vegetation clearing
- Injury or fatality through vehicle or machinery interaction (including during vegetation clearing)
- Habitat fragmentation and connectivity loss
- Degradation of habitat through increased noise, light, dust, vibration, weed and pest incursion, erosion and sedimentation or water quality changes
- Increased risk of bushfire / change to fire regimes.

Direct impacts associated with the Project include vegetation clearing and topsoil removal for installation of the Wackett-2 and Wackett-14 flowlines, within a total area of 7.19 ha.

Disturbance to this area is expected to be temporary, with impacts only occurring during pipeline construction and operation. The area will be rehabilitated immediately following the operational phase of the pipeline. Evidence of successful rehabilitation is present in parts of the study area where recruitment of shrubby vegetation within previously cleared areas is evident.

4.2. Avoidance and mitigation measures

The environmental mitigation hierarchy of avoid, minimise, and mitigate impacts will be implemented during construction phase of the Project and will continue to be implemented throughout the life of the Project.

The Project has been designed in accordance with the principle of avoiding environmental harm. The direct impact area for the Project has been deliberately located within the existing historical disturbance associated with the Wackett South 1 Gas Flowline to the greatest extent possible.

Avoidance and mitigation measures to be implemented include:

- Locate flowline within existing disturbance wherever possible
- Pre-clearance surveys / use of fauna spotter catchers during clearing
- Implementing speed limits to reduce the likelihood of vehicle strike fauna injuries and fatalities
- Relocation of habitat features, such as logs, into retained habitat
- Relocation of any disturbed lignum to the side of the RoW
- Avoid removal of any mature trees
- Topsoil will be stored appropriately to help with rehabilitation
- Culverts to be constructed where pipeline crosses mapped watercourses to limit impacts to water movement across the landscape.

Additional mitigation measures to be implemented may include:

- Sequential clearing

- Clearing to occur outside of breeding season
- Implementation of buffer zones
- Where possible, AWAs will be micro-sited to avoid clearing of tall (greater than 1.7 m) and dense lignum on channels
- Management of habitat degrading processes such as dust and erosion through speed limits, implementation of erosion and sedimentation controls
- Introduce fencing to areas where grey grasswren habitat occurs to mitigate grazing pressure.

4.3. Significant residual impact assessment

A significant residual impact assessment has been undertaken in accordance with the *Significant Residual Impact Guideline* (DEHP, 2014) for all MSES identified within the impact area (Table 9). This guideline relates only to MSES and does not apply to Matters of Local Environmental Significance or Matters of National Environmental Significance. MSES were defined as per the definitions provided in Schedule 2 of the EO Regulation.

The MSES regulated vegetation, connectivity areas and protected wildlife habitat were identified within the proposed impact area and a significant residual impact assessment was undertaken for each of these values (Table 10).

The implementation of avoidance, mitigation and management measures will minimise impacts to MSES. No significant impact to MSES is likely to occur as a result of the proposed development.

Table 9: Summary of impacts to MSES

MSES	MSES description	Area of impact (ha)	Significant impact?
Regulated vegetation	REs intersecting a watercourse	2.73	No
Connectivity areas	Area of remnant vegetation	5.82	No
Protected wildlife habitat	Grey grasswren	5.23	No
	Southern whiteface	5.23	No
	Plains wanderer	4.99	No
	Grey falcon	5.82	No
	Blue-winged parrot	5.23	No

Table 10: Significant residual impact assessment for MSES in the impact area

Significant residual impact criteria	Response to criteria	Significant residual impact
Regulated vegetation – REs intersecting a watercourse		
1. For clearing for linear infrastructure: • greater than 25 m wide in a grassland (structural category) RE; or • greater than 20 m wide in a sparse (structural category) RE; or • greater than 10 m wide in a dense to mid-dense (structural category) RE. AND 2. Clearing will occur within 5 m of the defining bank.	Total area of regulated vegetation to be cleared within a defined distance of a watercourse is 2.73 ha. Defined distances of a watercourse include the following: • within 100 m of a ≥ 5 stream order watercourse.	No significant residual impact will occur if clearing does not exceed 20 m in width.
Connectivity		
A significant residual impact occurs if either of the following are true: • the change in the core remnant ecosystem extent at the local scale (post impact) is greater than a threshold determined by the level of fragmentation at the regional scale; or • any core area that is greater than or equal to 1 ha is lost or reduced to patch fragments (core to non-core).	The level of fragmentation at the regional scale (within 20 km of study area) is very low (nearly 100% remnant REs). Therefore, the local impact threshold for change in the extent of remnant REs is >50%. The proposed impact will not result in disturbance to > 50% of remnant REs at the local scale (within 5 km of the study area).	No significant residual impact predicted to occur.
Protected wildlife habitat (including essential habitat)		
An action is likely to have a significant impact on endangered and vulnerable wildlife habitat (including essential habitat) if the impact on the habitat is likely to: • lead to a long-term decrease in the size of a local population; or • reduce the extent of occurrence of the species; or • fragment an existing population; or • result in genetically distinct populations forming as a result of habitat isolation; or • result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species habitat; or • introduce disease that may cause the population to decline; or • interfere with the recovery of the species; or • cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species.	Refer to impact assessments in Appendix F. The total area of habitat within the study area for each species is: • Grey grasswren (5.23ha). • Southern whiteface (5.23 ha). • Plains wanderer (4.99 ha). • Grey falcon (5.82 ha). • Blue-winged parrot (5.23 ha).	No significant residual impact on protected wildlife habitat for Grey grasswren, Southern whiteface, Plains wanderer, Grey falcon, and Blue-winged parrot is likely to occur.

5. Conclusion and recommendations

A desktop and field assessment were undertaken to identify ecological values potentially present within the Wackett-2 and Wackett-14 flowline study area. The assessment identified the presence of the EPBC Act endangered Grey grasswren within the study area along with potential suitable habitat for the Southern whiteface, Plains wanderer, Grey falcon and Blue-winged parrot.

A significant impact assessment was completed based on the assumption that activity within the study area will be micro-sited to avoid impacts within areas of higher environmental value. To avoid significant residual impact on MSES values, clearing limits within areas of regulated vegetation must be adhered to.

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Appendix A Desktop assessment results

Queensland Government

Department of Environment and Science

Environmental Reports

Biodiversity and Conservation Values

Biodiversity Planning Assessments and Aquatic Conservation Assessments

For the selected area of interest
Longitude: 141.9915788 Latitude: -27.5229664 with 2 kilometre radius

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 co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

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 values 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.

Please direct queries about these reports to: biodiversity.planning@des.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

Tables 1 to 8 provide an overview of the AOI with respect to selected topographic and environmental values.

Table 1: Area of interest details: Longitude: 141.9915788 Latitude: -27.5229664

Size (ha)	1,256.55
Local Government(s)	Bulloo Shire
Bioregion(s)	Channel Country
Subregion(s)	Cooper - Diamantina Plains
Catchment(s)	Cooper Creek

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Assessment Type	Assessment Area and Version
Biodiversity Planning Assessment(s)	Channel Country v1.1
Aquatic Conservation Assessment(s) (riverine)	Lake Eyre and Bulloo Basins v1.1
Aquatic Conservation Assessment(s) (non-riverine)	Lake Eyre and Bulloo Basins v1.1

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	0.0	0.0
Of concern	0.0	0.0
No concern at present	1,256.55	100.0

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of Environment and Science's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	0.0	0.0
State	1,256.55	100.0
Regional	0.0	0.0
Local or Other Values	0.0	0.0

Table 5: Non-riverine wetlands intersecting the AOI

Non-riverine wetland types intersecting the area of interest	#
Number of Palustrine wetlands	1
Number of Lacustrine wetlands	0

Non-riverine wetland types intersecting the area of interest	#
Total number of non-riverine wetlands	1

NB. The figures presented in the table above are derived from the relevant non-riverine Aquatic Conservation Assessment(s). Later releases of wetland mapping produced via the Queensland Wetland Mapping Program may provide more recent information in regards to wetland extent.

Table 6: Named waterways intersecting the AOI

Name	Permanency
COOPER CREEK	Non-perennial
LIGNUM CREEK	Non-perennial

Refer to **Map 1** for general locality information.

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of Environment and Science's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	1,256.55	100.0
High	0.0	0.0
Medium	0.0	0.0
Low	0.0	0.0
Very Low	0.0	0.0

Table 8: Summary table, aquatic conservation significance (non-riverine)

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	220.72	17.57
High	0.0	0.0
Medium	0.0	0.0
Low	0.0	0.0
Very Low	0.0	0.0

Biodiversity Planning Assessments

Introduction

The Department of Environment and Science (DES) attributes biodiversity significance on a bioregional scale through a Biodiversity Planning Assessment (BPA). A BPA involves the integration of ecological criteria using the *Biodiversity assessment and Mapping Methodology* (BAMM) and is developed in two stages: 1) **diagnostic criteria**, and 2) **expert panel criteria**. The diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion, while the expert panel criteria allows for the refinement of the mapped information from the diagnostic output by incorporating local knowledge and expert opinion.

The BAMM methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition, ecosystem diversity, landscape context and connection, and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes. While natural resource values such as dryland salinity, soil erosion potential or land capability are not dealt with explicitly, they are included to some extent within the biodiversity status of regional ecosystems recognised by the DES.

Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

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

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	0.0	0.0
State	1,256.55	100.0
Regional	0.0	0.0
Local or Other Values	0.0	0.0

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

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the

Environment Protection and Biodiversity Conservation Act 1999. It excludes highly mobile fauna taxa which are instead considered in Criterion H and brings together information on EVNT taxa using buffering of recorded sites or habitat suitability models (HSM) where available.

Criteria B. Ecosystem value: Classifies on the basis of biodiversity status of regional ecosystems, their extent in protected areas (presence of poorly conserved regional ecosystems), the presence of significant wetlands; and areas of national importance such as the presence of Threatened Ecological Communities, World Heritage areas and Ramsar sites. Ecosystem value is applied at a bioregional (**B1**) and regional (**B2**) scale.

Criteria C. Tract size: Measures the relative size of tracts of vegetation in the landscape. The size of any tract is a major indicator of ecological significance, and is also strongly correlated with the long-term viability of biodiversity values. Larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller tracts.

Criteria D. Relative size of regional ecosystems: Classifies the relative size of each regional ecosystem unit within its bioregion (**D1**) and its subregion (**D2**). Remnant units are compared with all other occurrences with the same regional ecosystem. Large examples of a regional ecosystem are more significant than smaller examples of the same regional ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

Table 10: Summary of biodiversity significance based upon diagnostic criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains an RE that is one of the largest of its type in the bioregion (D1) & Remnant has high connectivity or buffers an endangered RE or Sig. Wetland (G)	1,035.84	82.44
Local or Other Values	Refer to diagnostic data for additional information	220.72	17.57

Assessment of diagnostic criteria with respect to the AOI

The following table reflects an assessment of the individual diagnostic criteria noted above in regards to the AOI.

Table 11: Assessment of individual diagnostic criteria with respect to the AOI

Diagnostic Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
A: Habitat for EVNT Taxa					1,256.56	100.0		
B1: Ecosystem Value (Bioregion)					1,256.56	100.0		
B2: Ecosystem Value (Subregion)					1,256.56	100.0		
C: Tract Size			1,256.56	100.0				
D1: Relative RE Size (Bioregion)	1,035.84	82.4					220.72	17.6
D2: Relative RE Size (Subregion)	1,035.84	82.4					220.72	17.6
F: Ecosystem Diversity			1,256.56	100.0				
G: Context and Connection	1,256.56	100.0						

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I)	638.9	50.85

Biodiversity significance	Description	Area (Ha)	% of AOI
State	Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) & Remnant forms part of a bioregional corridor (J)	617.65	49.15

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well correlated with any particular regional ecosystem, taxa important for maintaining genetic diversity (such as complex spatial patterns of genetic variation, geographic range limits, highly disjunct populations), taxa critical for management or monitoring of biodiversity (functionally important or ecological indicators), or economic and culturally important taxa.

Criteria I. Special biodiversity values: areas with special biodiversity values are important because they contain multiple taxa in a unique ecological and often highly biodiverse environment. Areas with special biodiversity values can include the following:

- Ia - centres of endemism - areas where concentrations of taxa are endemic to a bioregion or subregion are found.
- Ib - wildlife refugia (Morton *et al*. 1995), for example, islands, mound springs, caves, wetlands, gorges, mountain ranges and topographic isolates, ecological refuges, refuges from exotic animals, and refuges from clearing. The latter may include large areas that are not suitable for clearing because of land suitability/capability.
- Ic - areas with concentrations of disjunct populations.
- Id - areas with concentrations of taxa at the limits of their geographic ranges.
- Ie - areas with high species richness.
- If - areas with concentrations of relictual populations (ancient and primitive taxa).
- Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.
- Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.
- Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.
- Ij - breeding or roosting sites used by a significant number of individuals.
- Ik - climate change refuge.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to access overall biodiversity significance with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa								
Ia: Centres of Endemism	220.72	17.6						
Ib: Wildlife Refugia	1,256.56	100.0						
Ic: Disjunct Populations			220.72	17.6				
Id: Limits of Geographic Ranges	1,256.56	100.0						

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
Ie: High Species Richness	1,256.56	100.0						
If: Relictual Populations			220.72	17.6				
Ig: Variation in Species Composition	1,256.56	100.0						
Ih: Artificial Wetland								
Ii: Hollow Bearing Trees								
Ij: Breeding or Roosting Site	1,256.56	100.0						
Ik: Climate Refugia								

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes. *Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.*

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

  • Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;

  • Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;

  • Maintaining large scale seasonal/migratory species processes and movement of fauna;

  • Maximising connectivity between large tracts/patches of remnant vegetation;

  • Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial

  • Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);

  • Follow major watershed/catchment and/or coastal boundaries;

  • Incorporate major altitudinal/geological/climatic gradients;

  • Include and maximise connectivity between large tracts/patches of remnant vegetation;

  • Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

• Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Table 14: Extent of triggered remnant vegetation due to the presence of BPA derived corridors with respect to the AOI

Biodiversity Significance	Area (Ha)	% of AOI
State	617.65	49.15
Regional	0.0	0.0
Local	0.0	0.0

NB: area figures associated with the extent of corridor triggered remnant vegetation are only available for those bioregions where a BPA has been undertaken.

Refer to **Map 3** for further information.

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
chc_l_16	Ephemeral wetlands	State	Ia (centre of endemism): VERY HIGH Ib (wildlife refugia): VERY HIGH Ic (disjunct populations): HIGH Id (geographic range limit): HIGH Ie (high species diversity): VERY HIGH If (relictual populations): HIGH Ig (RE's show distinct variation in species composition): VERY HIGH Ij (breeding or roosting sites): VERY HIGH
chc_l_17	Floodplain linkages	State	Ib (wildlife refugia): VERY HIGH Id (geographic range limit): VERY HIGH Ie (high species diversity): VERY HIGH Ig (RE's show distinct variation in species composition): VERY HIGH Ij (breeding or roosting sites): VERY HIGH
chc_l_19	Riparian Corridors	State	J (Corridors): State

Expert panel decision descriptions:

chc_l_16

Habitat for a wider range of invertebrates and algae than permanent and semi-permanent waterholes, including species such as fairy shrimp and shield shrimp which do not occur in more permanent waterholes where fish predation is higher. Support waterbird populations estimated systematically to be in the millions of individuals and breeding colonies or dispersed waterbird breeding numbering tens of thousands of pairs (for multiple species) (Reid and Jaensch in Costelloe et al 2004);

among the most important recruitment areas for waterbirds in Australia (Jaensch 2009); include the most important sites in Australia for a suite of waterbird species in terms of numbers (supporting >1% of total population size). Many of the wetlands, at several scales, can be demonstrated to meet criteria for international importance.

Includes areas outside of floodplains that may fill from local runoff. Includes salt pan systems which have their own unique suit of species.

These wetlands go dry every year or nearly every year. They will go dry by end of the year in average seasons but last during good seasons or after very large floods and when clusters of good flood seasons occur.

chc_l_17

Links wetland type ecosystems. Provides all ecosystem services associated with flood events. These biodiversity values are defined using the greatest flood event.

Good Flood (above Major). All channels, gutters and floodways are activated, with overland flows across the tops of channels banks and levees; sand dunes become isolated islands; 80 - 100% of the floodplain inundated

Handy Flood (Major). Braid gutters activated as sheets of water spread out from the main channels, most downstream water flow is via the floodways formed by braid gutters; 50 - 60% of the floodplain inundated

Gutter Flood (Moderate). Water escaping from primary and secondary channels into channel and braid gutters but generally contained within gutter channels; 5 - 15% of the floodplain inundated

Channel Flood (Minor). Water just escaping from primary channels and into channel gutters; <5% of the floodplain inundated

River flow (below Minor). Water contained within river banks; no floodplain inundation

chc_l_19

Riparian corridors in the Channel Country are significant for biodiversity both as a climatic refuge and as a major element of habitat continuity including connecting permanent waterholes.

Includes major channels (250k geodata hierarchy 1) plus minor channels (250k geodata hierarchy 2 3) necessary to capture permanent waterholes, buffered by 1km either side and clipped to land zone 3.

Aquatic Conservation Assessments

Introduction

The Aquatic Biodiversity Assessment and Mapping Method or AquaBAMM (Clayton *et al.* 2006), was developed to assess conservation values of wetlands in queensland, and may also have application in broader geographical contexts. It is a comprehensive method that uses available data, including data resulting from expert opinion, to identify relative wetland conservation/ecological values within a specified study area (usually a catchment). The product of applying this method is an Aquatic Conservation Assessment (ACA) for the study area.

An ACA using AquaBAMM is non-social, non-economic and identifies the conservation/ecological values of wetlands at a user-defined scale. It provides a robust and objective conservation assessment using criteria, indicators and measures that are founded upon a large body of national and international literature. The criteria, each of which may have variable numbers of indicators and measures, are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. An ACA using AquaBAMM is a powerful decision support tool that is easily updated and simply interrogated through a geographic information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning prcesses

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland *Info*:

http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For

flora species the traits included:

- It forms significant macrophyte beds (in shallow or deep water).
- It is an important food source.
- It is important/critical habitat.
- It is implicated in spawning or reproduction for other fauna and/or flora species.
- It is at its distributional limit or is a disjunct population.
- It provides stream bank or bed stabilisation or has soil binding properties.
- It is a small population and subject to threatening processes.

Fauna species are included if they meet at least one of the following traits:

- It is endemic to the study area (>75 per cent of its distribution is in the study area/catchment).
- It has experienced, or is suspected of experiencing, a serious population decline.
- It has experienced a significant reduction in its distribution and has a naturally restricted distribution in the study area/catchment.
- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	1,256.55	100.0

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
High	0.0	0.0
Medium	0.0	0.0
Low	0.0	0.0
Very Low	0.0	0.0

The individual aquatic conservation criteria ratings for riverine wetlands within the AOI are listed below.

Table 17: Level/s of riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic			946.74	75.3	309.82	24.7		
2. Naturalness catchment	1,256.56	100.0						
3. Diversity and richness					1,256.56	100.0		
4. Threatened species and ecosystems			1,256.56	100.0				
5. Priority species and ecosystems	1,256.56	100.0						
6. Special features	1,256.56	100.0						
7. Connectivity	1,256.56	100.0						
8. Representative-ness								

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
cp_r_ec_02	Wilson's Swamp, Tanbar and Eulbertie waterholes	Cooper	6.1.1	3
cp_r_fa_05	Lower Cooper waterbird - Tooley Wooley Water Hole and Naryilco Complex	Cooper	5.1.4	4
cp_r_fa_07	Permanent waterholes - long term	Cooper	6.3.1	4
cp_r_fl_01	Lignum swamps along channels	Cooper	5.2.1	3

4 is the highest rating/value

Expert panel decision descriptions:

cp_r_ec_02

The unique geomorphology of the sand dunes has created permanent water holes (Wilson's Swamp, Tanbar and Eulbertie waterholes).

cp_r_fa_05

Large accumulations of waterbirds. Ten to 15 colonial nesting waterbird breeding species, large numbers of each. The permanent waterholes provide a significant resource in an otherwise arid region (Blackman et al. 1999). The Bilpa-Baryulah ('Nappa Merrie') to Tooley Wooley's Water Holes area is a significant waterbird breeding floodplain on the lower Cooper in Qld, but poorly researched (DERM 2009a). AridFlo was not granted permission to survey the Nappa Merrie portion in 2000, but historical accounts (Chenery 1921) attest to the large ibis-egret colonies there, and we (R. Jaensch J. Reid) have observed colonial nesting waterbirds breeding there and on the Tooley Woolies in smaller flood years on the Cooper. This tract could be drawn to include the southern portions of the 'Big Bend', e.g. Yetally Waterhole, to capture all of the important waterbird breeding habitat in this district.

cp_r_fa_07

Ecological processes in the LEBB work over vast timeframes of centuries or 1000's of years. The permanent waterholes (100% permanent >100 years) that never go dry over these longer timeframes are critically important to aquatic species persistence in these arid landscapes. They have a major influence on the genetic diversity and gene flow between river catchments. These waterholes act as refugia (Hamilton et al. 2005), e.g. metapopulation and genetics of the Cooper Creek turtle requires long time frames of persistence to sustain populations and species. However, the panel cautioned that care is required for broad application of this decision as some wetlands have been modified through water extraction (Bunn et al. 2006).

cp_r_fl_01

Large lignum swamps provide important habitat for waterbirds, including breeding and feeding habitat especially for colonial waterbird species, e.g. egrets, herons, ibis, and for other fauna. These swamps are associated with river channels lined with river coolabahs. etc. 5.3.13a: Palustrine wetland of **Muehlenbeckia florulenta** open-shrubland sometimes with scattered low trees such as **Acacia stenophylla, A. victoriae, Eremophila bignoniiflora, Eucalyptus coolabah**. Occurs on floodplains in depressions or fringing channels.

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
Very High	220.72	17.57
High	0.0	0.0
Medium	0.0	0.0
Low	0.0	0.0
Very Low	0.0	0.0

The following table provides an assessment of non-riverine wetlands within the AOI and associated aquatic conservation criteria values.

Table 20: Level/s of non-riverine aquatic conservation significance based on selected criteria

Criteria	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
1. Naturalness aquatic	220.72	17.6						
2. Naturalness catchment	220.72	17.6						
3. Diversity and richness	220.72	17.6						
4. Threatened species and ecosystems	220.72	17.6						
5. Priority species and ecosystems					220.72	17.6		
6. Special features								
7. Connectivity								
8. Representative-ness	220.72	17.6						

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to non-riverine wetlands within the AOI.

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
cp_nr_ec_02	Temporary claypan wetlands	Cooper	5.2.1	3
cp_nr_fl_01	Bluebush with or without lignum swamps	Cooper	5.2.1	2
cp_nr_fl_02	Lignum swamps	Cooper	5.2.1	3

4 is the highest rating/value

Expert panel decision descriptions:

cp_nr_ec_02

A number of temporary claypan wetlands not fed by rivers have different biota adapted to different desiccation cycles e.g. fairy shrimp. For the majority of their time they are dry and are susceptible to cattle damage and woody debris removal. The REs associated with this decision are: 4.3.12b, d; 5.3.13b; 5.3.15a, b; 5.3.16a; 5.3.22a; 5.3.8b; 6.3.11; 6.3.11b.

cp_nr_fl_01

Bluebush with or without lignum swamps were identified as having significant flora and fauna values (though lesser value than wetlands of 5.3.13a\\\\b and 5.3.16b). 5.3.12a/b: Palustrine wetland of **Chenopodium auricomum** open-shrubland sometimes with scattered **Eucalyptus coolabah** low trees and **Eremophila bignoniiflora** tall shrubs. Occurs in swampy depressions on alluvial plains and on frequently flooded inter-dune flats and clay pans. Soils very deep, grey cracking clays of light to medium texture, and contain varying amounts of silt and sand. RE 4.3.24: **Chenopodium auricomum** +\\\\- **Muehlenbeckia florulenta** open shrubland in swampy depressions within floodplains with braided channels.

cp_nr_fl_02

Large lignum swamps provide important habitat for waterbirds, including breeding and feeding habitat especially for colonial waterbird species (e.g. egrets, herons, ibis), and for other fauna. These swamps are associated with river channels lined with river coolabahs. etc. 5.3.13a/b: Palustrine wetland of **Muehlenbeckia florulenta** open-shrubland sometimes with scattered low trees such as **Acacia stenophylla, A. victoriae, Eremophila bignoniiflora, Eucalyptus coolabah**. Occurs on floodplains in depressions or fringing channels or in depressions, lakes or larger claypans in dune systems.

Threatened and Priority Species

Introduction

This chapter contains a list of threatened and priority flora and/or fauna species that have been recorded on, or within 4km of the Assessment Area.

The information presented in this chapter with respect to species presence is derived from compiled databases developed primarily for the purpose of BPAs and ACAs. Data is collated from a number of sources and is updated periodically.

It is important to note that the list of species provided in this report, may differ when compared to other reports generated from other sources such as the State government's WildNet, Herbrecs or the federal government's EPBC database for a number of reasons.

Records for threatened and priority species are filtered and checked based on a number of rules including:

- Taxonomic nomenclature - current scientific names and status,
- Location - cross-check co-ordinates with location description,
- Taxon by location - requires good knowledge of the taxon and history of the record,
- Duplicate records - identify and remove,
- Expert panels - check records and provide new records,
- Flora cultivated records excluded,
- Use precise records less than or equal to 2000m,
- Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

Species	Common name	NCA status	EPBC status	Back on Track rank	Migratory species*	Wetland species**	Identified flora/fauna
Amytornis barbatus	grey grasswren	NT					FA
Amytornis barbatus barbatus	grey grasswren (Bulloo)	E	E	High			FA

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DES internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

**JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species*.

***I - wetland indicator species; D - wetland dependent species.*.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

(no results)

NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time

to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.

ACA Priority Species

A list of ACA priority species used in riverine and non-riverine ACAs that have been recorded on, or within approximately 4km of the AOI are contained in the following tables.

Table 24: Priority species recorded on, or within 4 km of the AOI - riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Ninox connivens	Barking Owl	Low	FA
Porzana fluminea	Australian Spotted Crake	Low	FA
Tribonyx ventralis	Black-tailed Native-hen	Low	FA

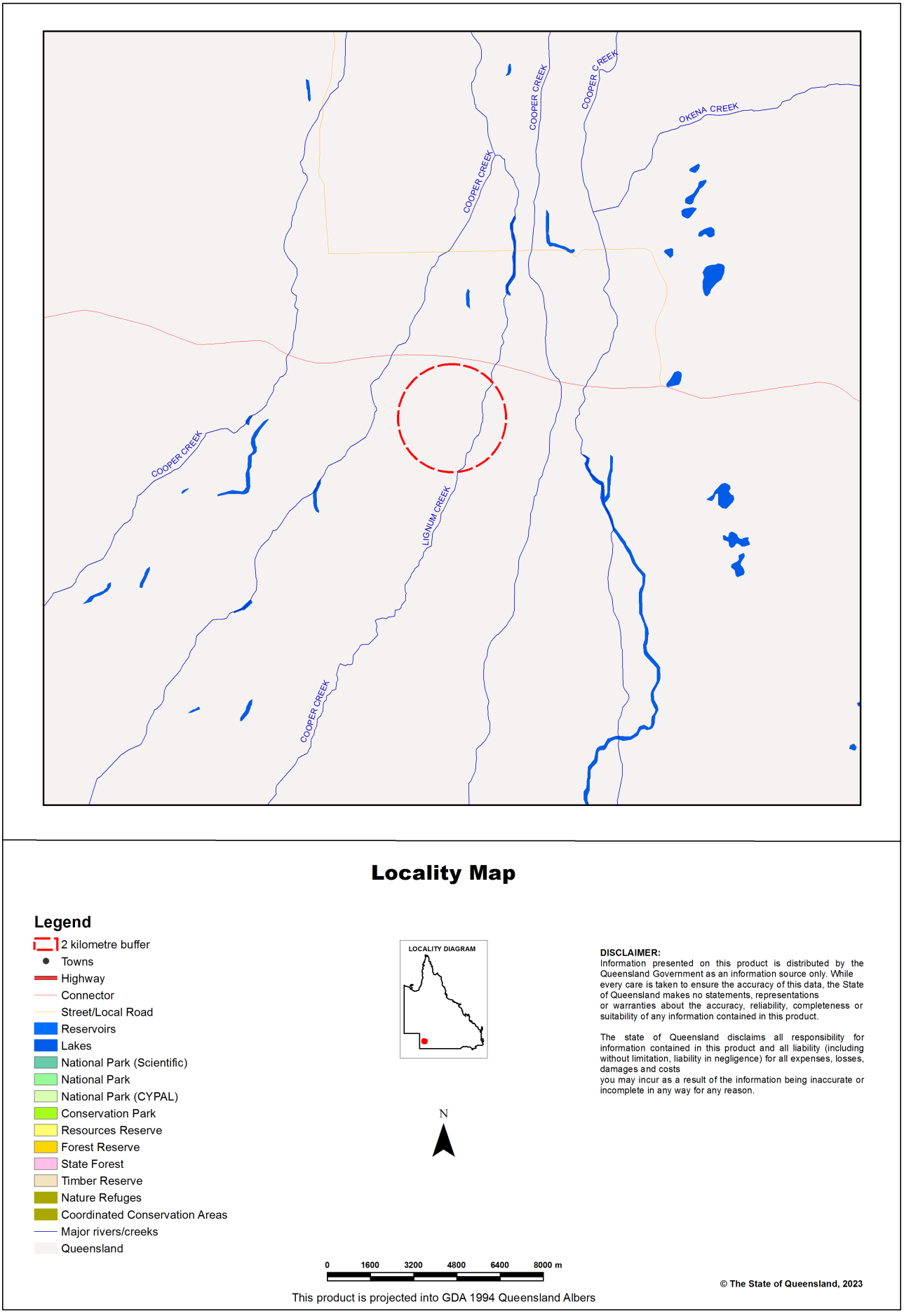
Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Ninox connivens	Barking Owl	Low	FA
Porzana fluminea	Australian Spotted Crake	Low	FA
Tribonyx ventralis	Black-tailed Native-hen	Low	FA

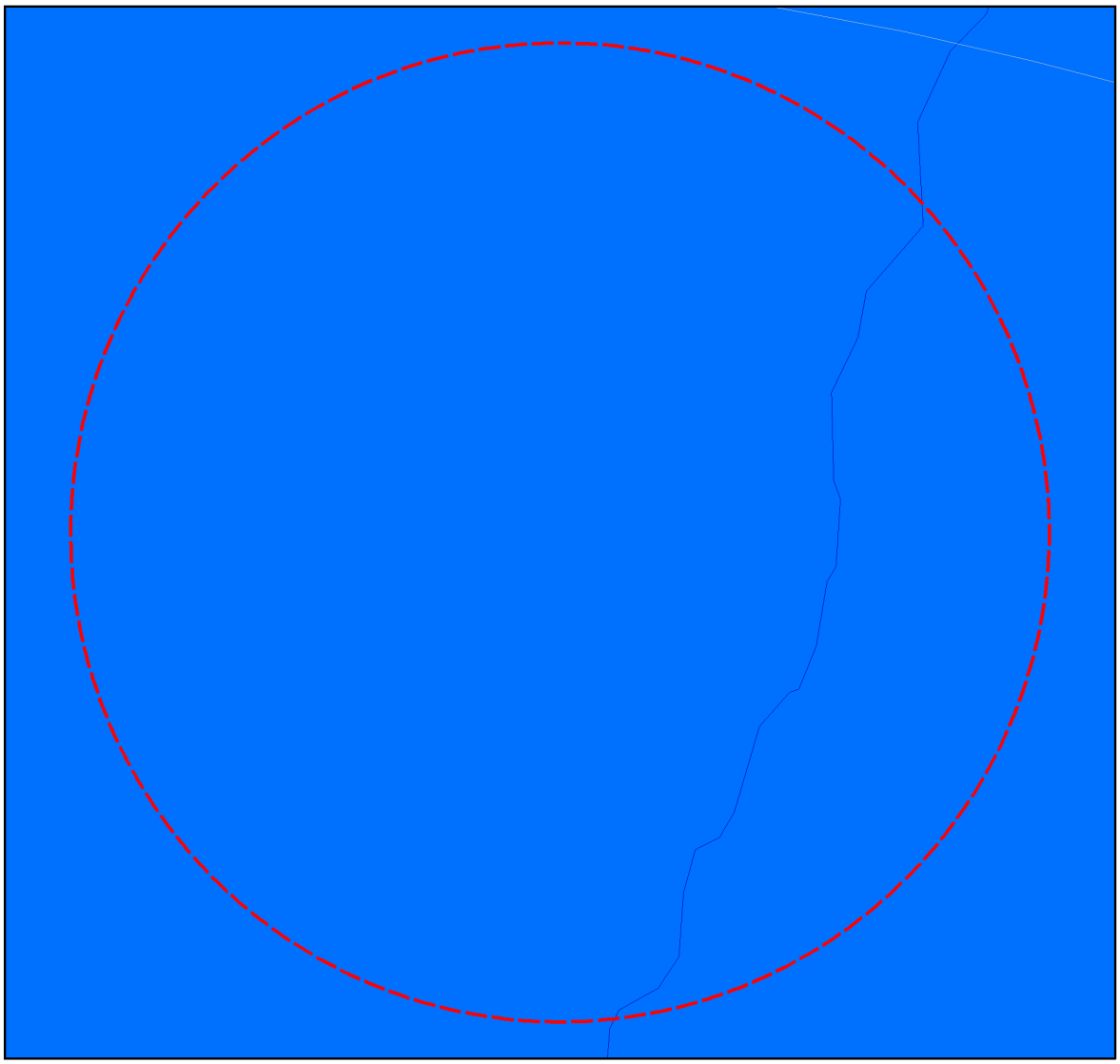
NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.

Maps

Map 1 - Locality Map



Map 2 - Biodiversity Planning Assessment (BPA)



Biodiversity Planning Assessments

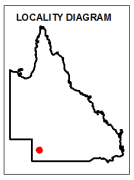
Legend

- 2 kilometre buffer
- Towns
- Roads
- Major rivers/creeks
- Queensland

Biodiversity Planning Assessment

- State Habitat for EVNT taxa
- State
- Regional
- Local or Other Values
- Non Bioregion Ecosystem

LOCALITY DIAGRAM



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0 240 480 720 960 1200 m

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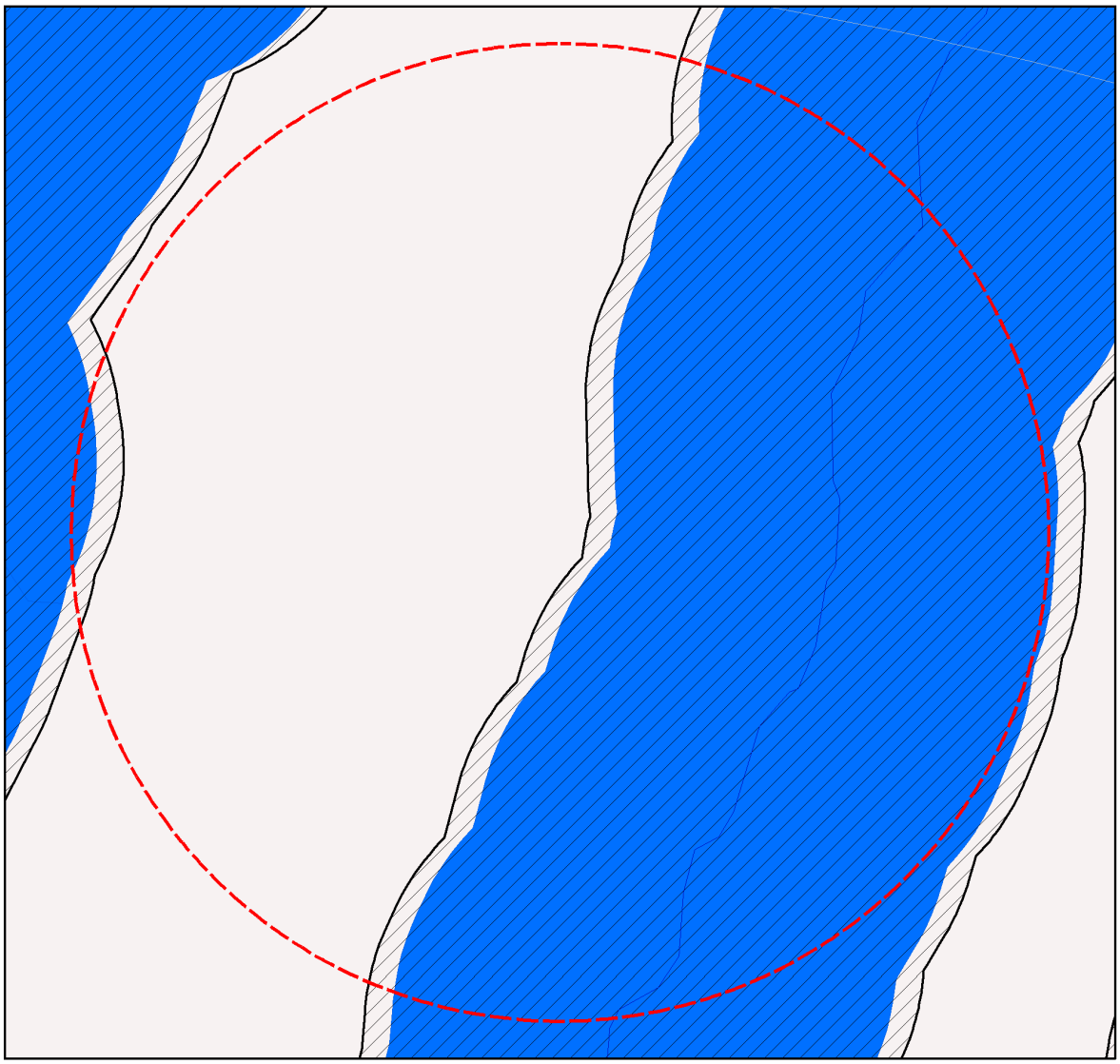
Map 3 - Corridors



Corridors

Legend

- 2 kilometre buffer
- Towns
- Roads
- Major rivers/creeks
- Queensland

Corridors

- State
- Regional

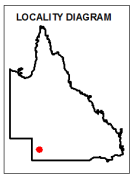
Corridor Triggered Vegetation

- State
- Regional
- Local

Core Area Vegetation

- Brigalow Belt only

LOCALITY DIAGRAM



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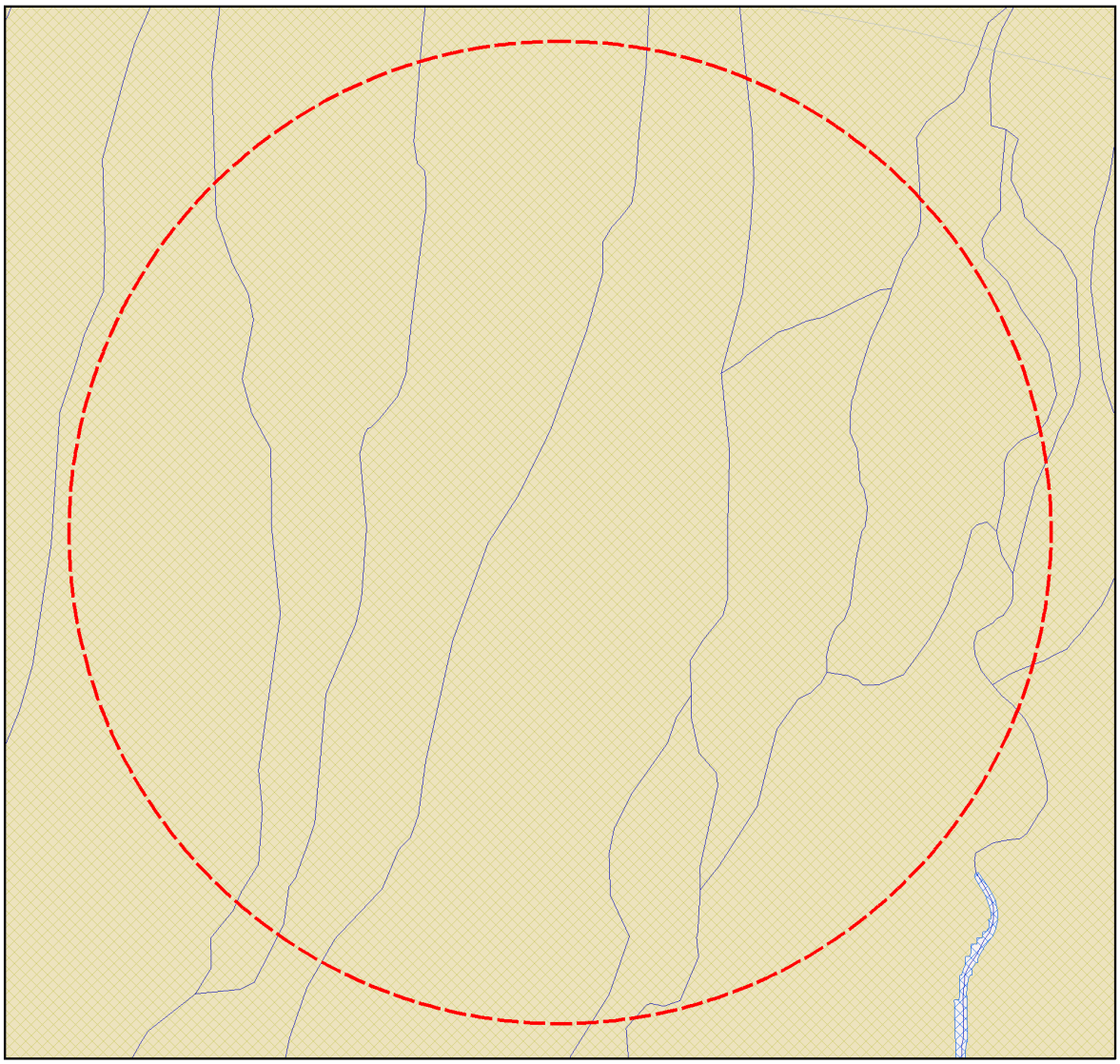
Map 4 - Wetlands and waterways



Legend

- 2 kilometre buffer
- Towns
- Roads
- Springs
- Rivers/Creeks
- Directory of Important Wetlands
- Ramsar Sites - QLD

Wetland Type

Hydrologically natural Wetlands

- Lacustrine Wetlands (hydrologically natural)
- Palustrine Wetlands (hydrologically natural)
- Riverine Wetlands (hydrologically natural)
- Intertidal Wetlands (hydrologically natural)
- Subtidal Wetlands (hydrologically natural)
- Intertidal/Subtidal Wetlands (hydrologically natural)

Hydrologically Modified and Artificial Wetlands

- Lacustrine Wetlands (hydrologically modified or artificial)
- Palustrine Wetlands (hydrologically modified or artificial)
- Riverine Wetlands (hydrologically modified or artificial)
- Intertidal Wetlands (hydrologically modified or artificial)
- Subtidal Wetlands (hydrologically modified or artificial)
- Intertidal/Subtidal Wetlands (hydrologically modified or artificial)

Subdominant Wetlands

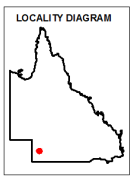
- Subdominant Wetlands (51 - 80%)

Contains Wetlands

- Contains Wetlands (1 - 50%)
- Queensland

Wetlands and Waterways

LOCALITY DIAGRAM



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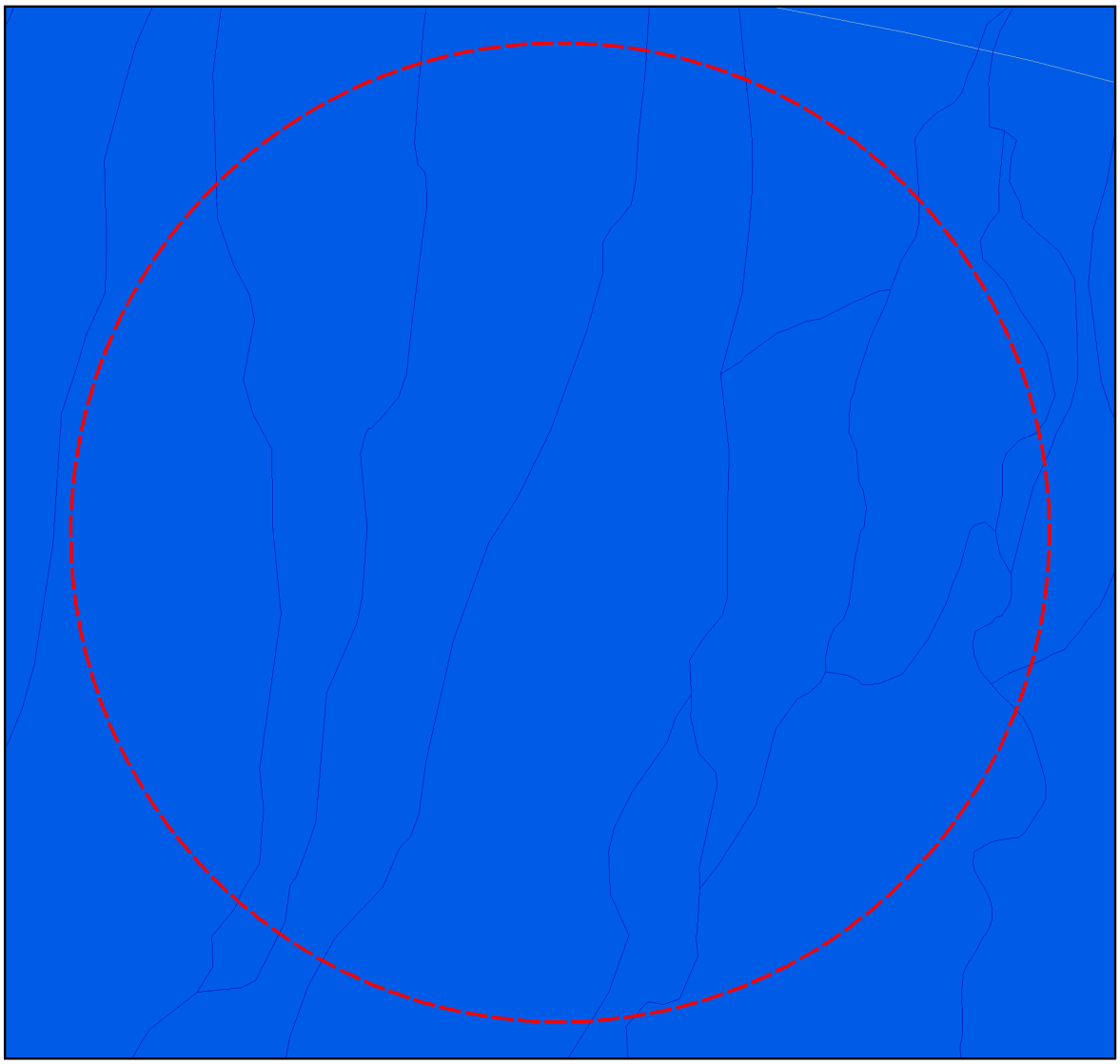
Map 5 - Aquatic Conservation Assessment (ACA) - riverine



Aquatic Conservation Assessment (ACA) - riverine

Legend

- 2 kilometre buffer
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Riverine - Subcatchment Significance

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

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0 240 480 720 960 1200 m

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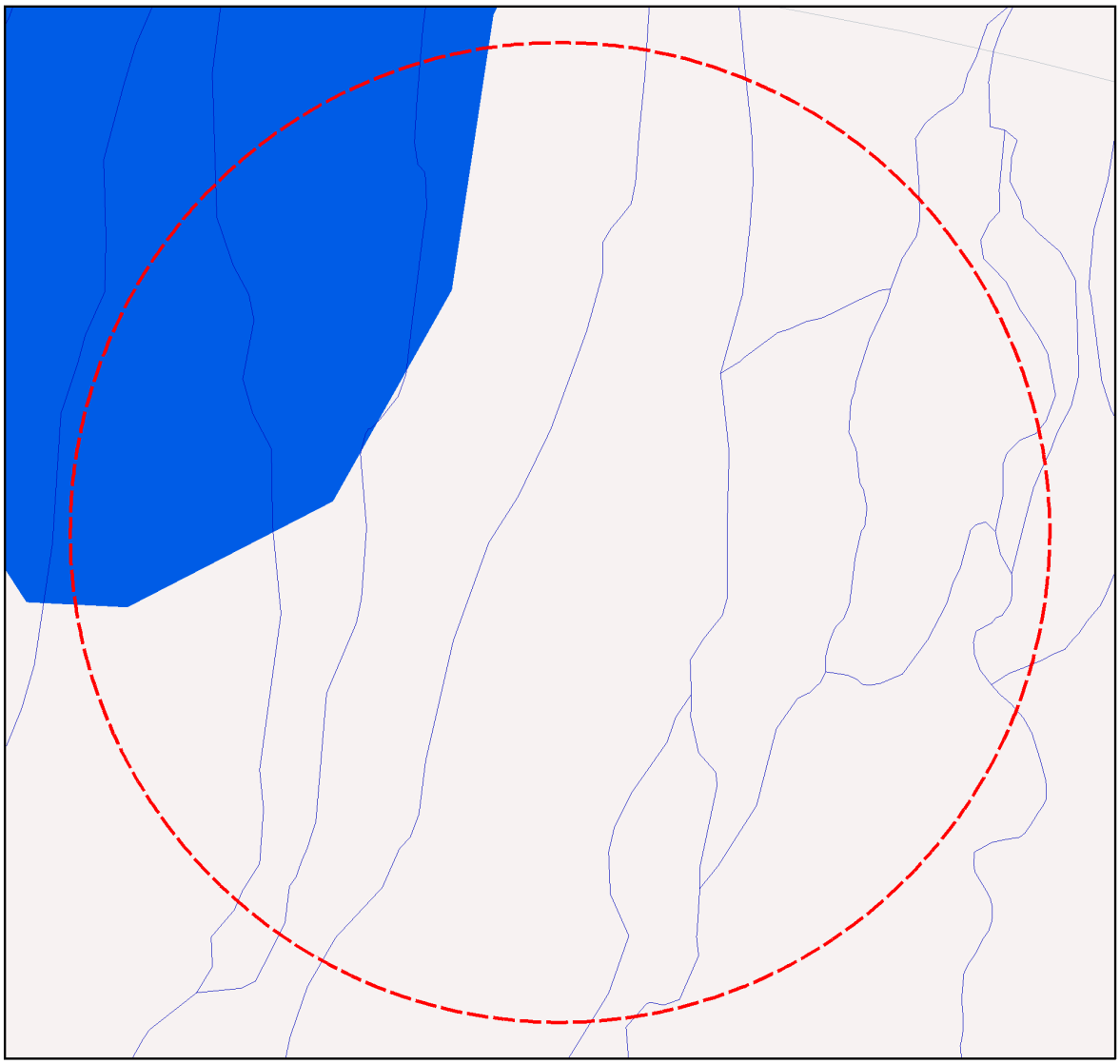
Map 6 - Aquatic Conservation Assessment (ACA) - non-riverine



Aquatic Conservation Assessment (ACA) - nonriverine

Legend

- 2 kilometre buffer
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

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0 240 480 720 960 1200 m

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References

Clayton, P.D., Fielder, D.F., Howell, S. and Hill, C.J. (2006) *Aquatic biodiversity assessment and mapping method (AquaBAMM): a conservation values assessment tool for wetlands with trial application in the Burnett River catchment.* Published by the Environmental Protection Agency, Brisbane. ISBN 1-90928-07-3. Available at

http://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

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Morton, S. R., Short, J. and Barker, R. D. with an Appendix by G.F. Griffin and G. Pearce (1995). *Refugia for Biological Diversity in Arid and Semi-arid Australia. Biodiversity Series* , Paper No. 4, Biodiversity Unit, Environment Australia.

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

Theme	Datasets
Aquatic Conservation Assessments Non-riverine*	Combination of the following datasets: Cape York Peninsula Non-riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Non-riverine v1.3 Lake Eyre and Bulloo Basins v1.1 QMDBB Non-riverine ACA v2.1 Southeast Queensland ACA v1.1 WBB Non-riverine ACA v1.1 Southern Gulf Catchments Non-riverine ACA v1.1
Aquatic Conservation Assessments Riverine*	Combination of the following datasets: Cape York Peninsula Riverine v1.1 Eastern Gulf of Carpentaria v1.1 Great Barrier Reef Catchment Riverine v1.1 Lake Eyre and Bulloo Basins v1.1 QMDBB Riverine ACA v2.1 Southeast Queensland ACA v1.1 WBB Riverine ACA v1.1 Southern Gulf Catchments Riverine ACA v1.1
Biodiversity Planning Assessments*	Combination of the following datasets: Brigalow Belt BPA v2.1 Cape York Peninsula BPA v1.1 Central Queensland Coast BPA v1.3 Channel Country BPA v1.1 Desert Uplands BPA v1.3 Einasleigh Uplands BPA v1.1 Gulf Plains BPA v1.1 Mitchell Grass Downs BPA v1.1 Mulga Lands BPA v1.4 New England Tableland v2.3 Northwest Highlands v1.1 Southeast Queensland v4.1 Wet Tropics v1.1
Statewide BPA Corridors*	Statewide corridors v1.6
Threatened Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
BPA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DES database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.

***These datasets are available at:**

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

Appendix 2 - Acronyms and Abbreviations

AOI	- Area of Interest
ACA	- Aquatic Conservation Assessment
AQUABAMM	- Aquatic Biodiversity Assessment and Mapping Methodology
BAMM	- Biodiversity Assessment and Mapping Methodology
BoT	- Back on Track
BPA	- Biodiversity Planning Assessment
CAMBA	- China-Australia Migratory Bird Agreement
DES	- Department of Environment and Science
EPBC	- *Environment Protection and Biodiversity Conservation Act 1999*
EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Longitude: 141.9915788 Latitude: -27.5229664 with 2 kilometre radius

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 point of interest.

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 values 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.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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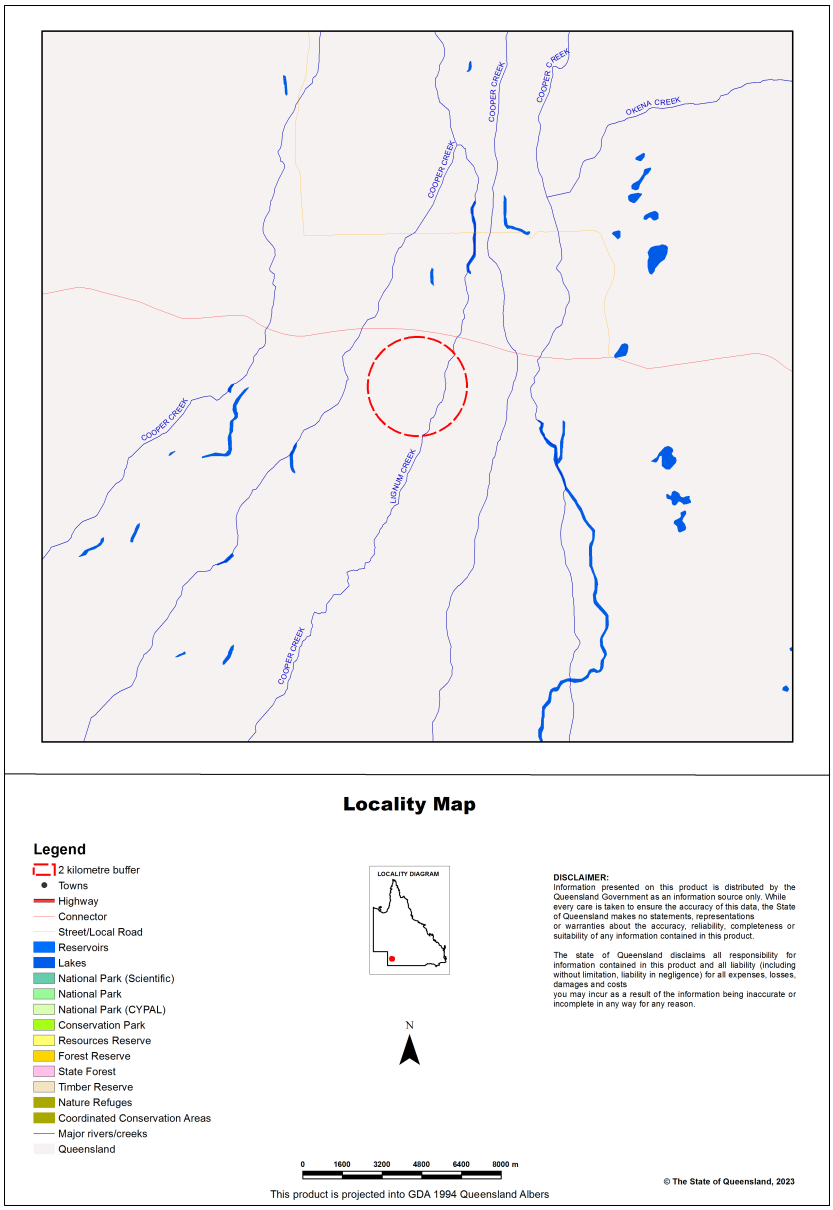
Table of Contents

Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Longitude: 141.9915788 Latitude: -27.5229664

Size (ha)	1,256.55
Local Government(s)	Bulloo Shire
Bioregion(s)	Channel Country
Subregion(s)	Cooper - Diamantina Plains
Catchment(s)	Cooper Creek



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	1256.55 ha	100.0%
5 High Ecological Significance wetlands on the map of Referable Wetlands	0.0 ha	0.0 %
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	0.0 ha	0.0 %
7b Special least concern animals	0.0 ha	0.0 %
7c i Koala habitat area - core (SEQ)	0.0 ha	0.0 %
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
7d Sea turtle nesting areas	0.0 km	Not applicable
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	0.0 ha	0.0 %
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	0.0 ha	0.0 %
8e Regulated Vegetation - intersecting a watercourse	23.3 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0.0 ha	0.0 %
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(no results)

1b. Protected Areas - nature refuges

(no results)

1c. Protected Areas - special wildlife reserves

(no results)

2. State Marine Parks - highly protected zones

(no results)

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

Regional planning interest type	Region	Status
Strategic Environmental Area - Designated Precinct	Channel Country	Current - June 2014

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

(no results)

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Not applicable

7b. Special least concern animals

Not applicable

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii		V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Macadamia integrifolia		V	None
Macadamia ternifolia		V	None
Macadamia tetraphylla		V	None
Melaleuca irbyana		E	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Phascolarctos cinereus	Koala - outside SEQ*	E	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Xeromys myoides	Water Mouse	V	None

**For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.*

Threatened (endangered or vulnerable) wildlife species records

(no results)

Special least concern animal species records

(no results)

Shorebird habitat (critically endangered/endangered/vulnerable)

Not applicable

Shorebird habitat (special least concern)

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals, Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

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

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Not applicable

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Not applicable

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Not applicable

8d. Regulated Vegetation - Essential habitat

Not applicable

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

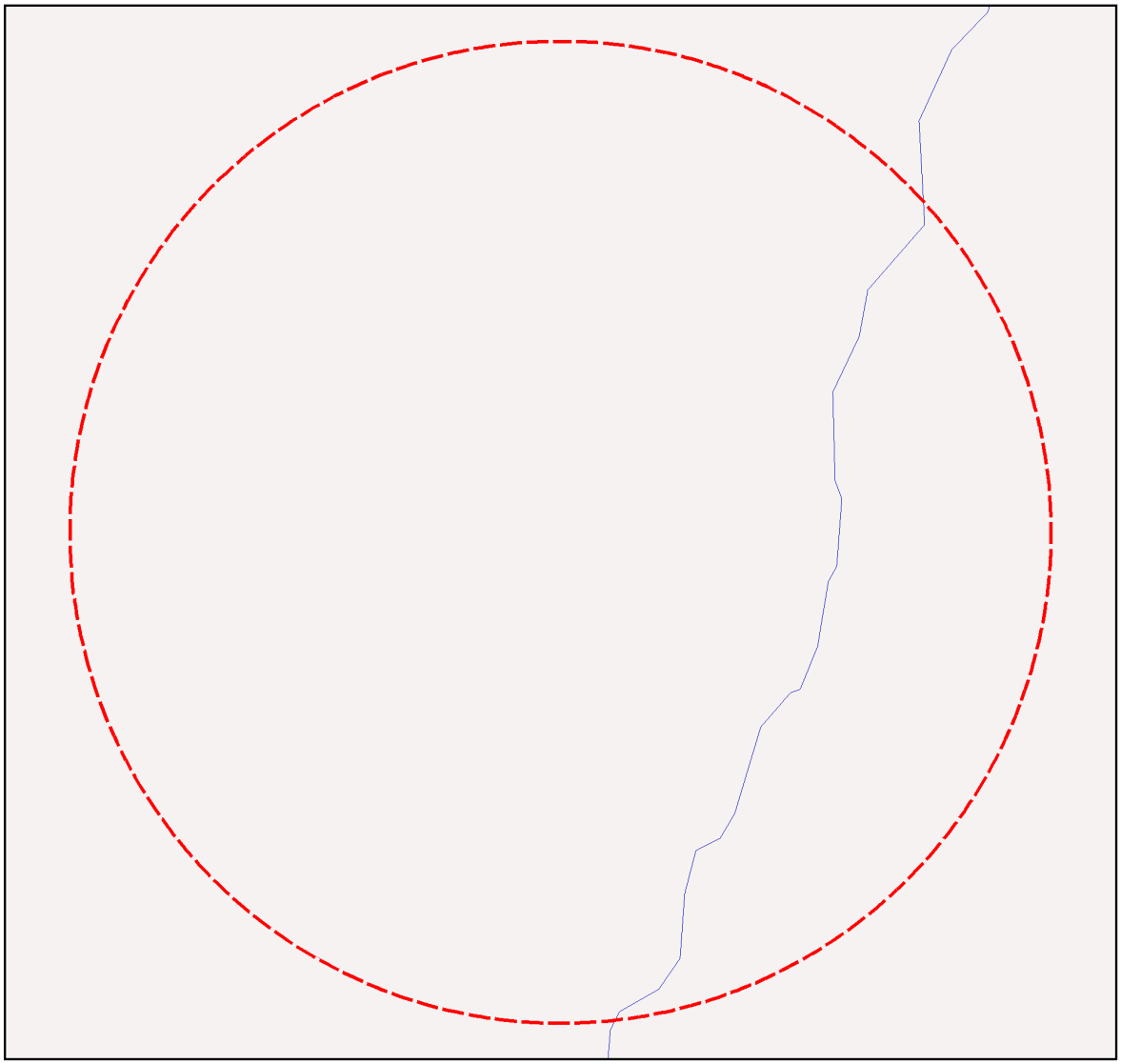
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas

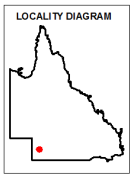


MSES - State Conservation Areas

Area of Interest

- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)

LOCALITY DIAGRAM



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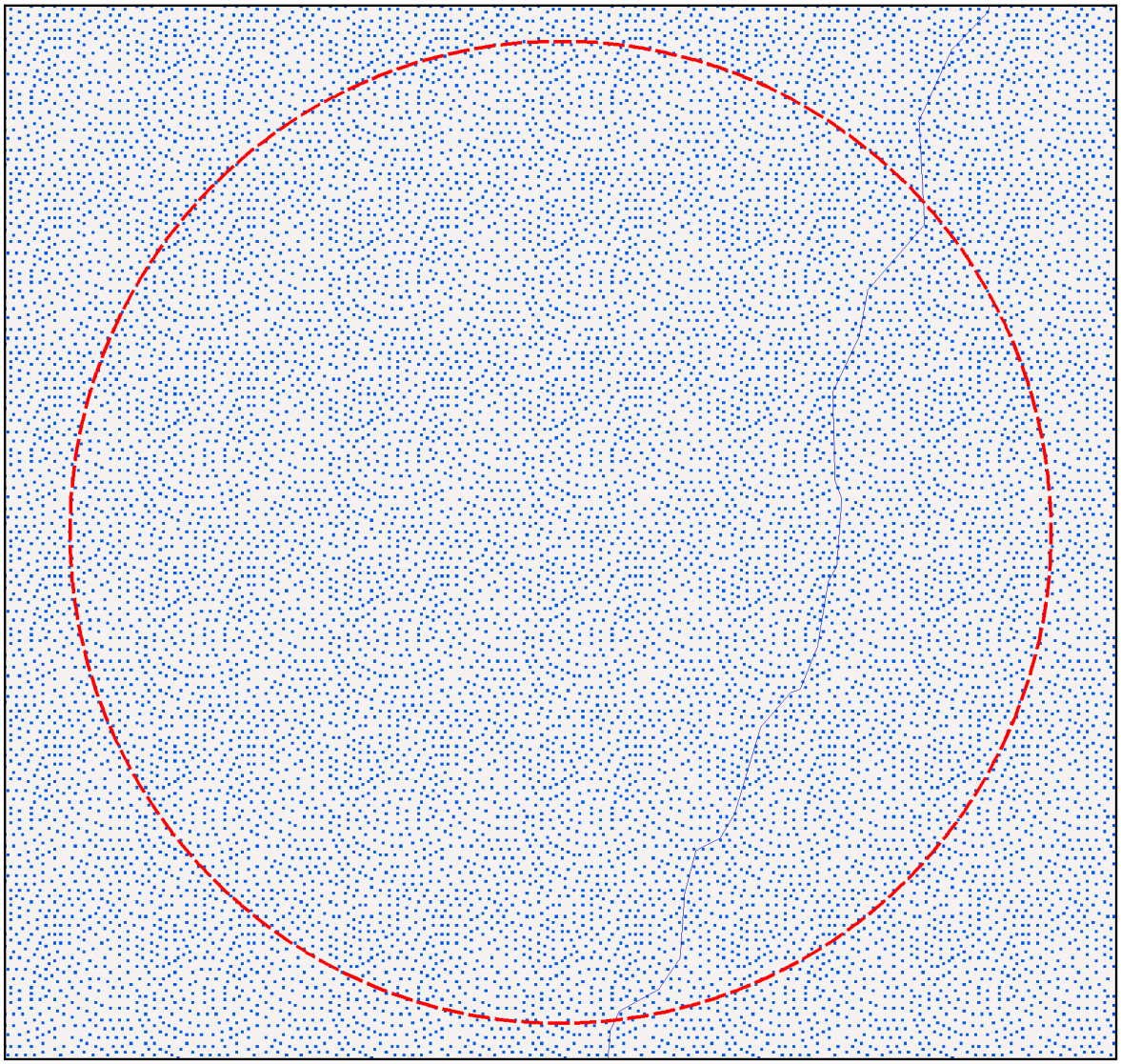
This product is projected into GDA 1994 Queensland Albers

Map 2 - MSES - Wetlands and Waterways

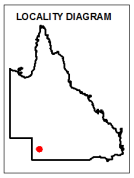


MSES - Wetlands and Waterways

Area of Interest

- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands

LOCALITY DIAGRAM



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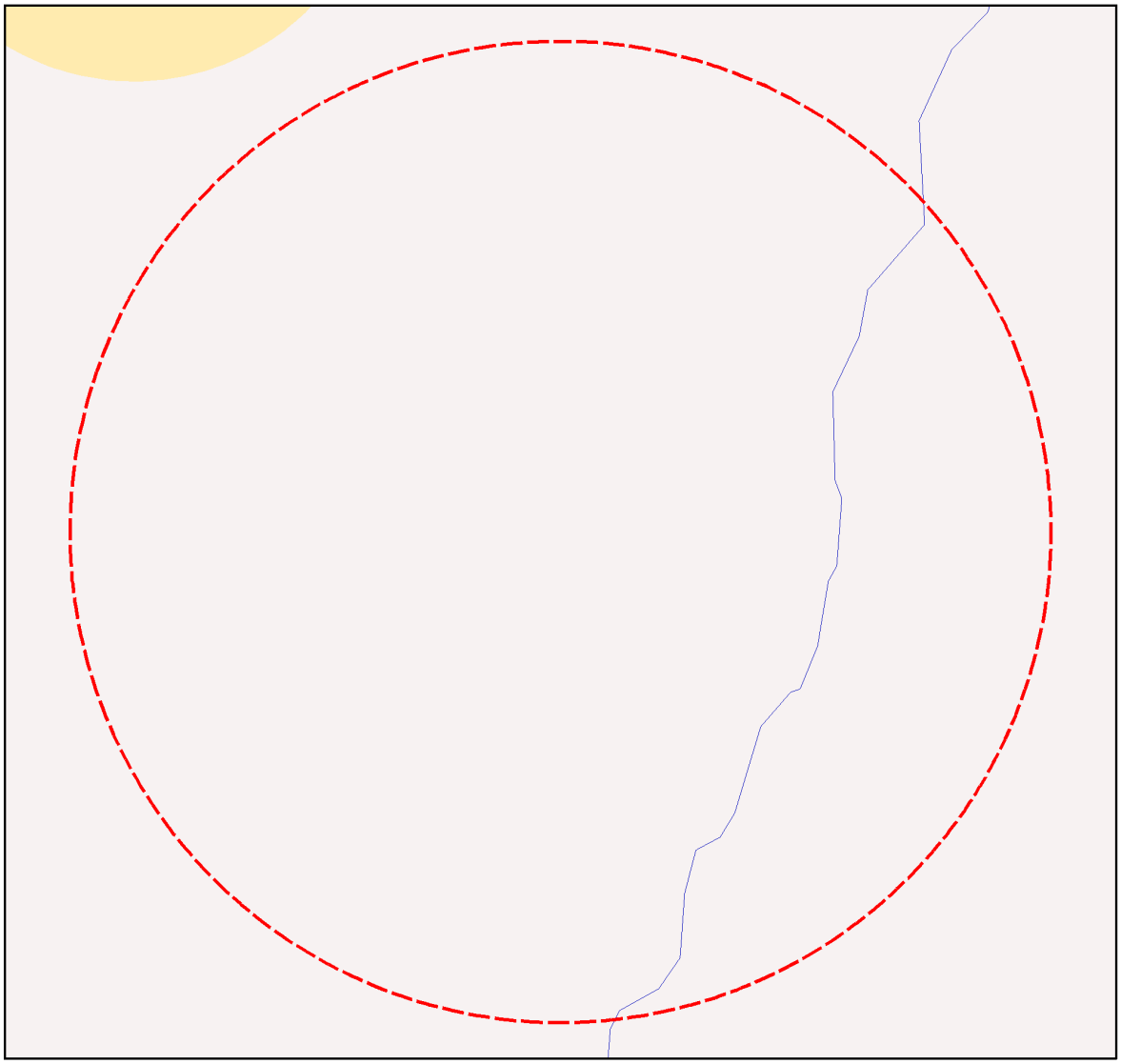
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals

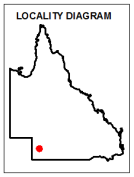


MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

Area of Interest

- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)

LOCALITY DIAGRAM



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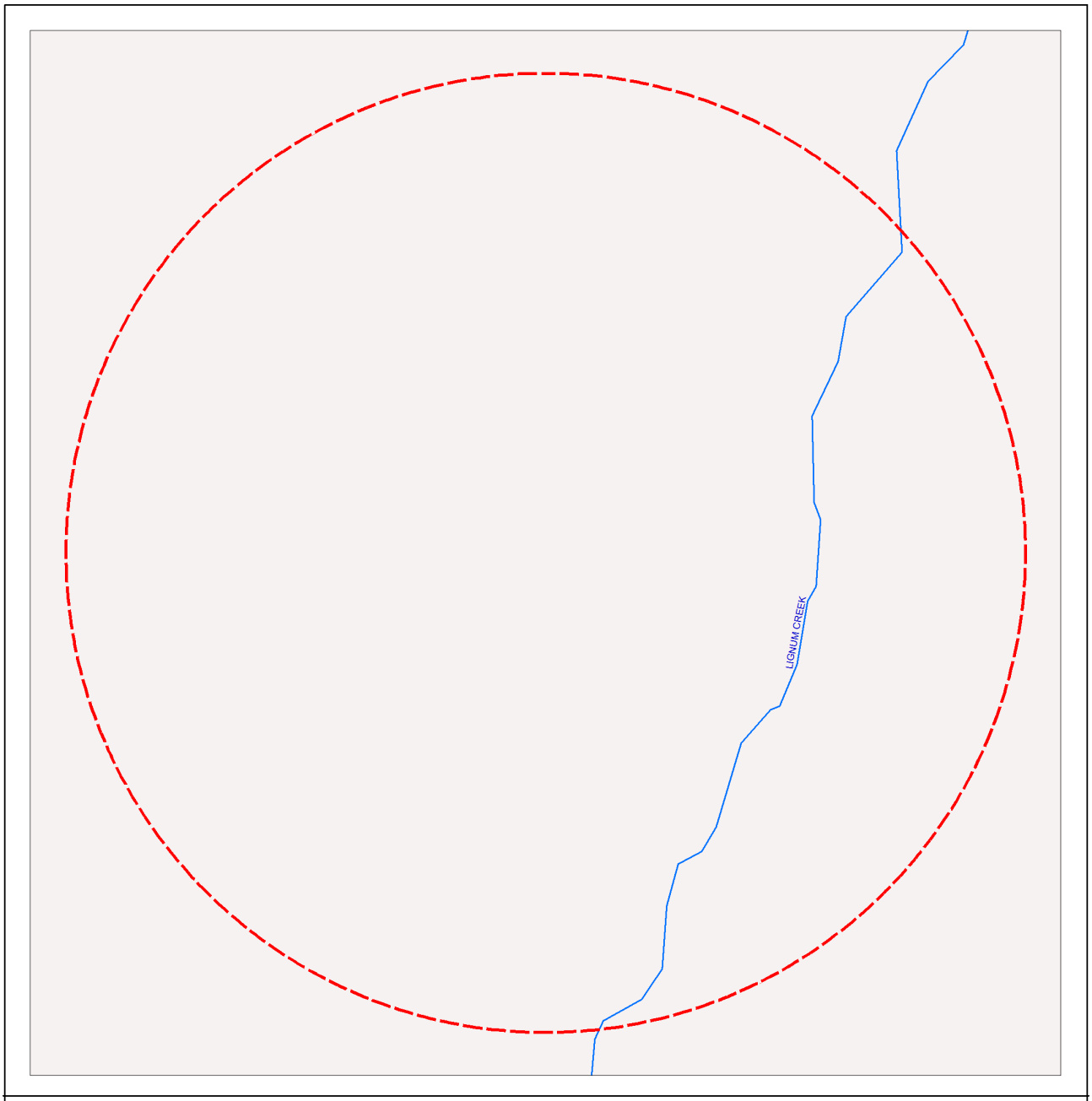
This product is projected into GDA 1994 Queensland Albers

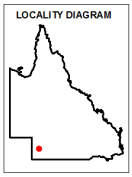
Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

Area of Interest
- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)

LOCALITY DIAGRAM



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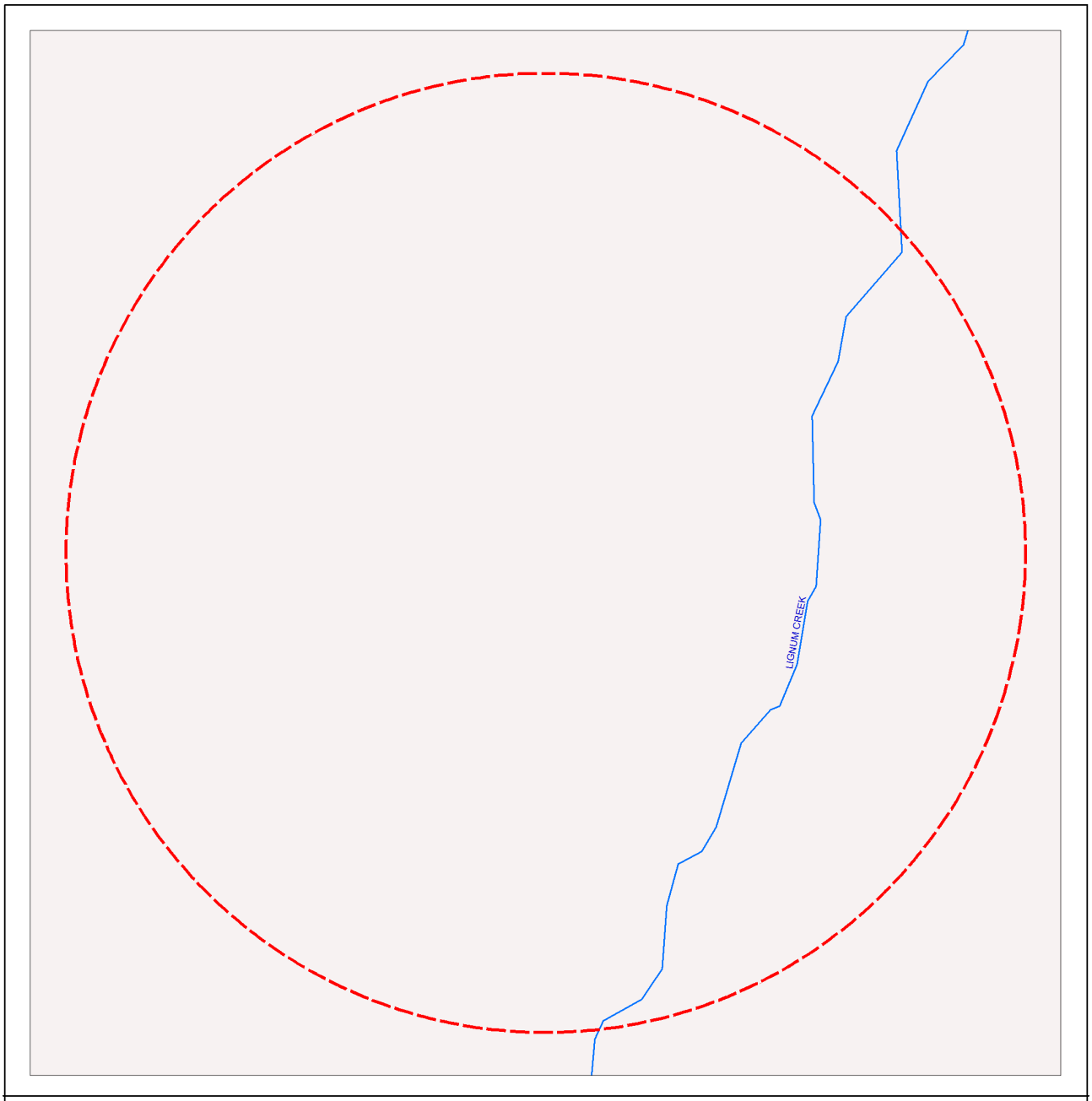
The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

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.

0 220 440 660 880 1,100 m

This product is projected into GDA 1994 Queensland Albers

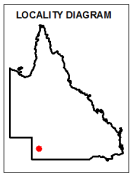
Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)



MSES - Wildlife habitat (sea turtle nesting areas)

Area of Interest
- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (sea turtle nesting areas)

LOCALITY DIAGRAM



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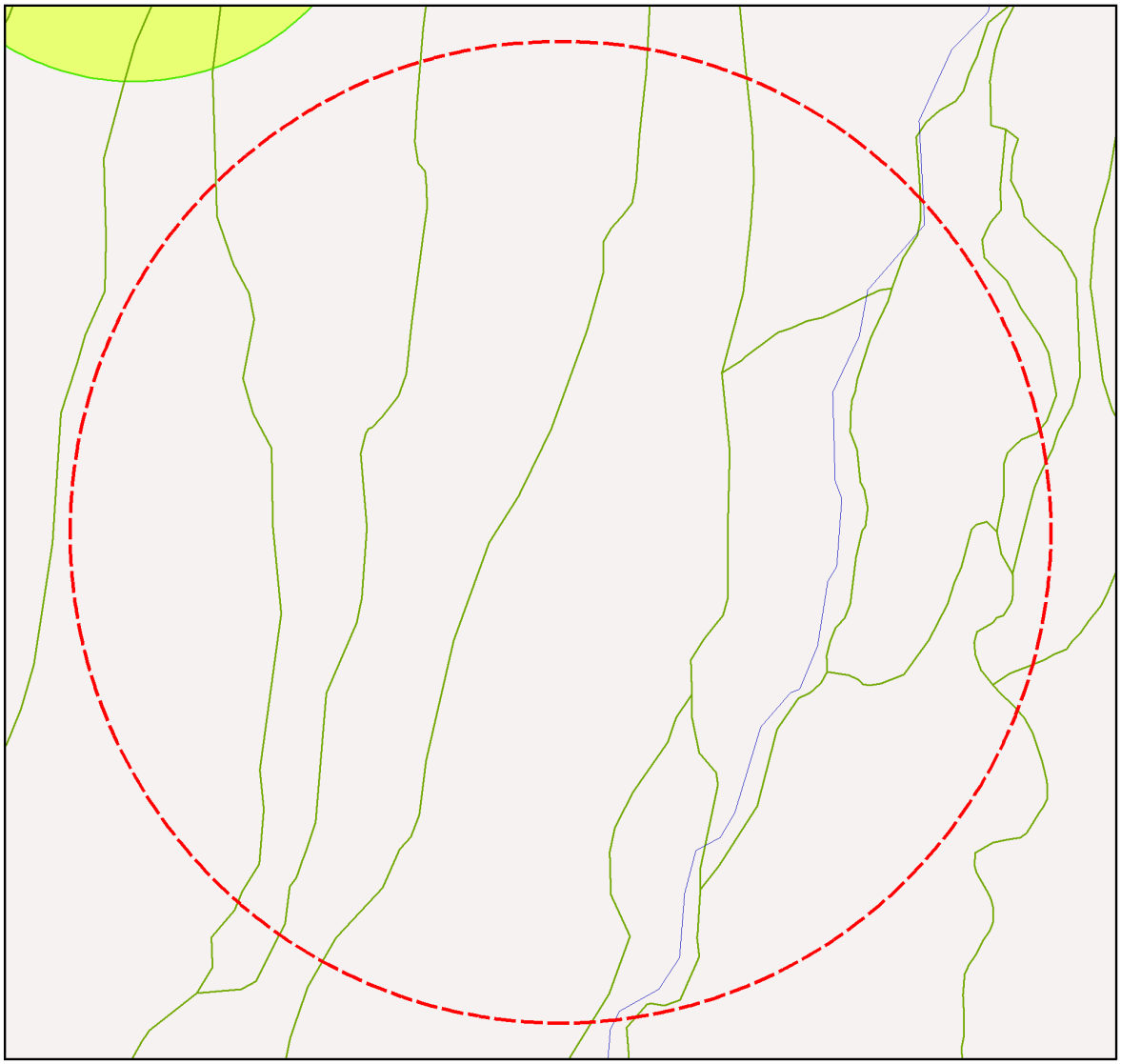
MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.

0 220 440 660 880 1,100 m

This product is projected into GDA 1994 Queensland Albers

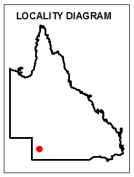
Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

Area of Interest

- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)



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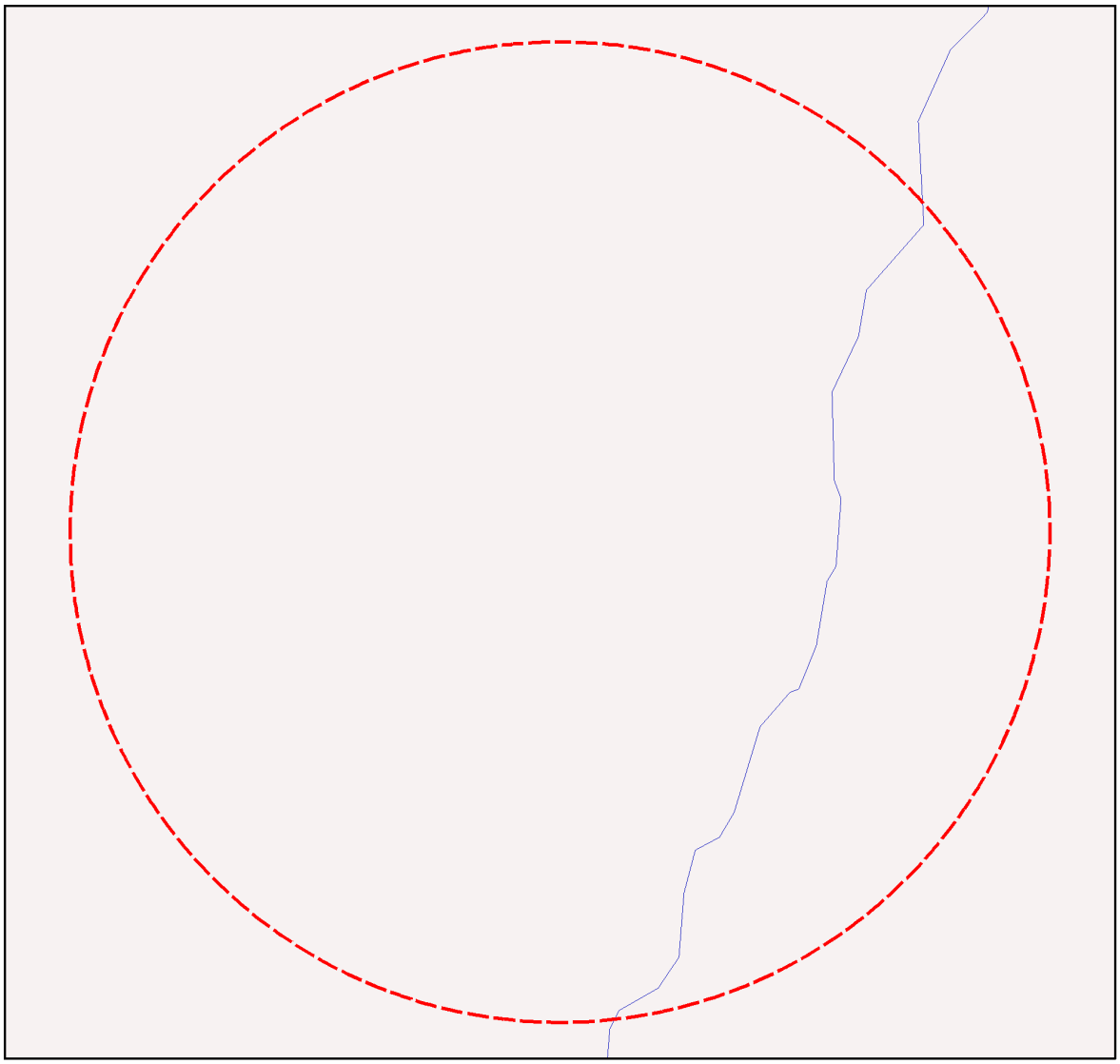
0 240 480 720 960 1200 m

This product is projected into GDA 1994 Queensland Albers

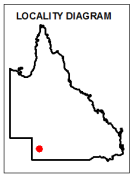
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

- 2 kilometre buffer
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)



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This product is projected into GDA 1994 Queensland Albers

Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	- WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019 - Sea Turtle Nesting Areas records
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DES
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DES	- Department of Environment and Science
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Longitude: 141.9915788 Latitude: -27.5229664 with 2 kilometre radius

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.resources.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: Longitude: 141.9915788 Latitude: -27.5229664 with 2 kilometre radius

Size (ha)	1,256.55
Local Government(s)	Bulloo Shire
Bioregion(s)	Channel Country
Subregion(s)	Cooper - Diamantina Plains
Catchment(s)	Cooper Creek

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	0.0	0.0
No concern at present	1,256.55	100.0
Total remnant vegetation	1,256.55	100.0

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 2022) 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.resources.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
5.3.18a	Braided channel complex of major alluvial plains, includes Chenopodium auricomum open shrubland and variable sparse to open-herbland	No concern at present	376.97	30.0
5.3.18b	Braided channel complex of major alluvial plains, includes Chenopodium auricomum open shrubland and variable sparse to open-herbland	No concern at present	753.93	60.0
5.3.8a	Eucalyptus coolabah low open woodland +/- Duma florulenta on braided channels, drainage lines, flood plain lakes and claypans	No concern at present	125.66	10.0

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
5.3.18a	Pre-clearing 1831000 ha; Remnant 2021 1830000 ha	34g	Palustrine	Low
5.3.18b	Pre-clearing 1831000 ha; Remnant 2021 1830000 ha	31a	Not a Wetland	Low
5.3.8a	Pre-clearing 399000 ha; Remnant 2021 399000 ha	16a	Riverine	Medium

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
5.3.18a	5.3.18: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna. 5.3.18a: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna. 5.3.18b: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna.
5.3.18b	5.3.18: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna. 5.3.18a: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna. 5.3.18b: Potential habitat for threatened fauna species including plains-wanderer Pedionomus torquatus and fierce snake (western taipan) Oxyuranus microlepidotus. Provides wetland habitat for a wide range of water birds and other flora and fauna.
5.3.8a	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
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.	125.66	10.0
31a	Open forblands to open tussock grasslands which may be composed of Atriplex spp. (saltbush), Sclerolaena spp. (burr), Asteraceae spp. and/or short grasses on alluvial plains.	753.93	60.0

BVG (1 Million)	Description	Area (Ha)	% of AOI
34g	Palustrine wetlands. Generally intermittent swamps/claypans on floodplains in inland areas dominated by chenopods e.g. Chenopodium auricomum (Queensland blue bush) or Tecticornia spp. (samphire) or herbs.	376.97	30.0

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 QBEIS 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. 2022 (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/

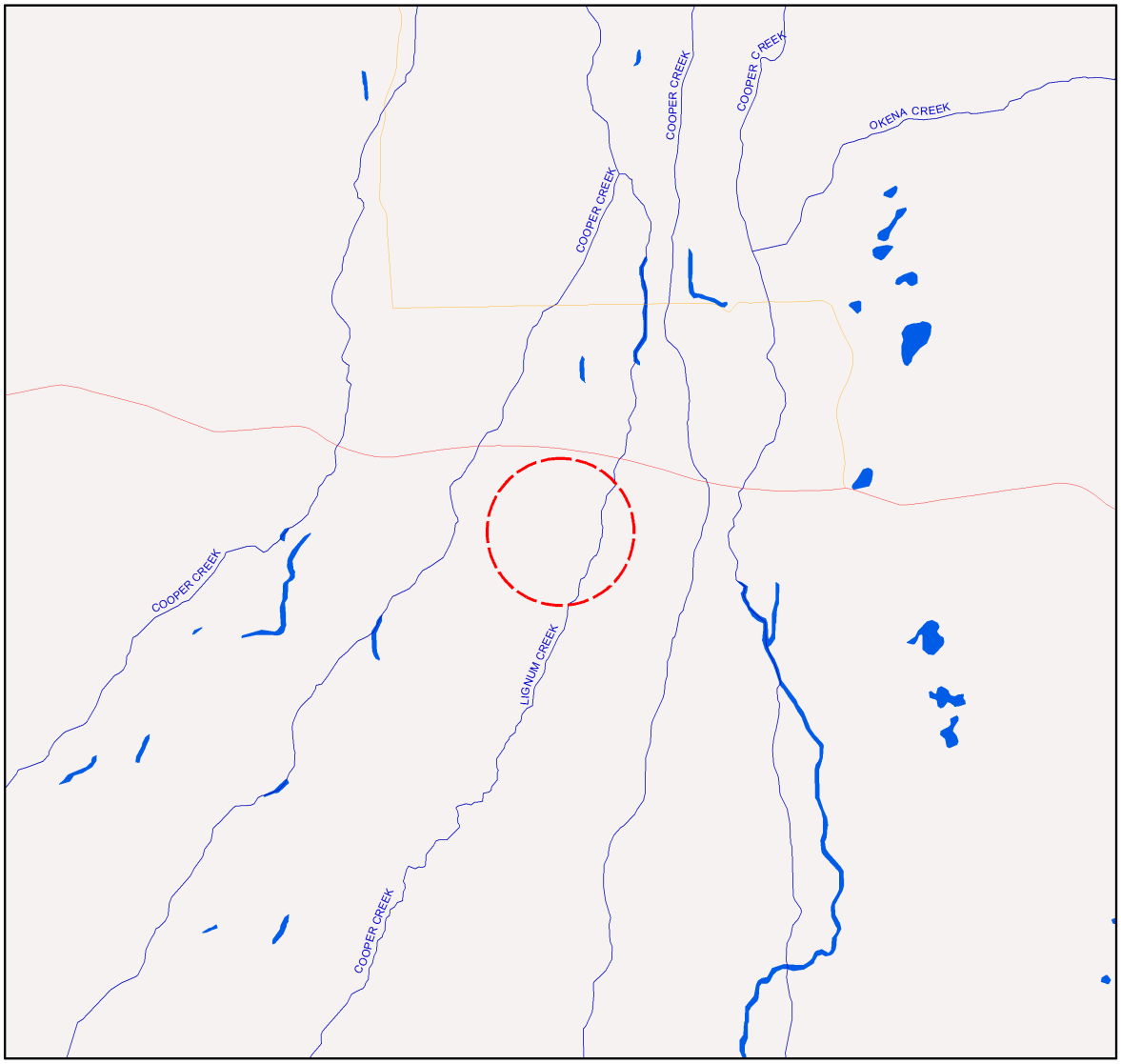
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance 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
5.3.18a	Not currently available	Not currently available
5.3.18b	Not currently available	Not currently available
5.3.8a	Not currently available	Not currently available

Maps

Map 1 - Location

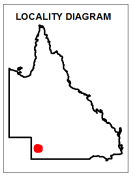


Locality Map

Legend

- 2 kilometre buffer
- Towns
- Highway
- Connector
- Street/Local Road
- Reservoirs
- Lakes
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Coordinated Conservation Areas
- Major rivers/creeks
- Queensland

LOCALITY DIAGRAM



N

0 1600 3200 4800 6400 8000 m

This product is projected into GDA 1994 Queensland Albers

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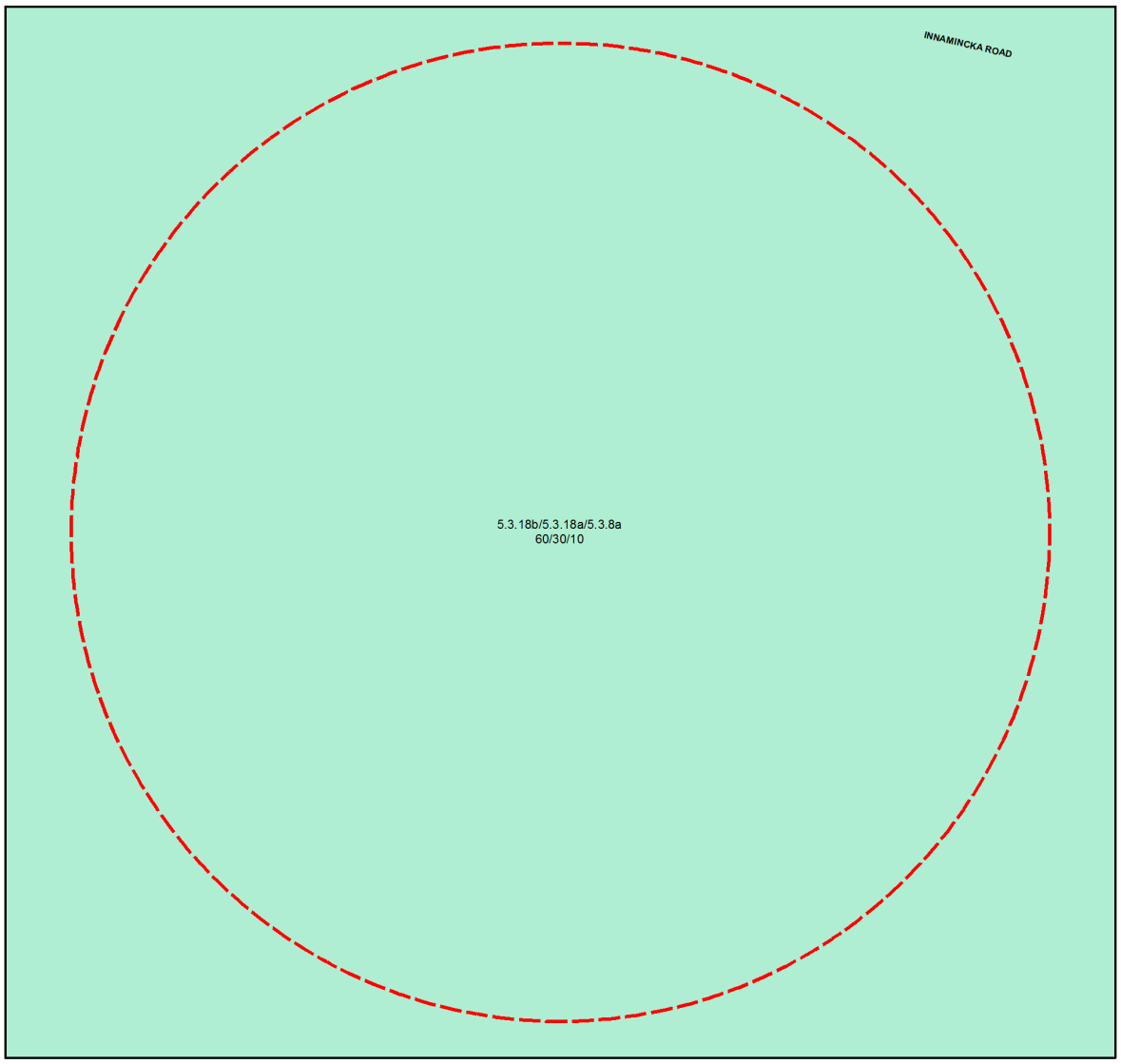
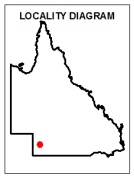
Map 2 - Remnant 2021 regional ecosystems

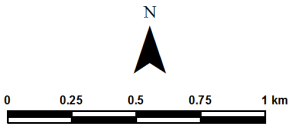


Remnant 2021 Regional Ecosystems

Biodiversity Status

- 2 kilometre buffer
- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Non-remnant vegetation, cultivated or built environment
- Plantation
- Water
- Cadastral Boundaries





Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.

Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.

The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".

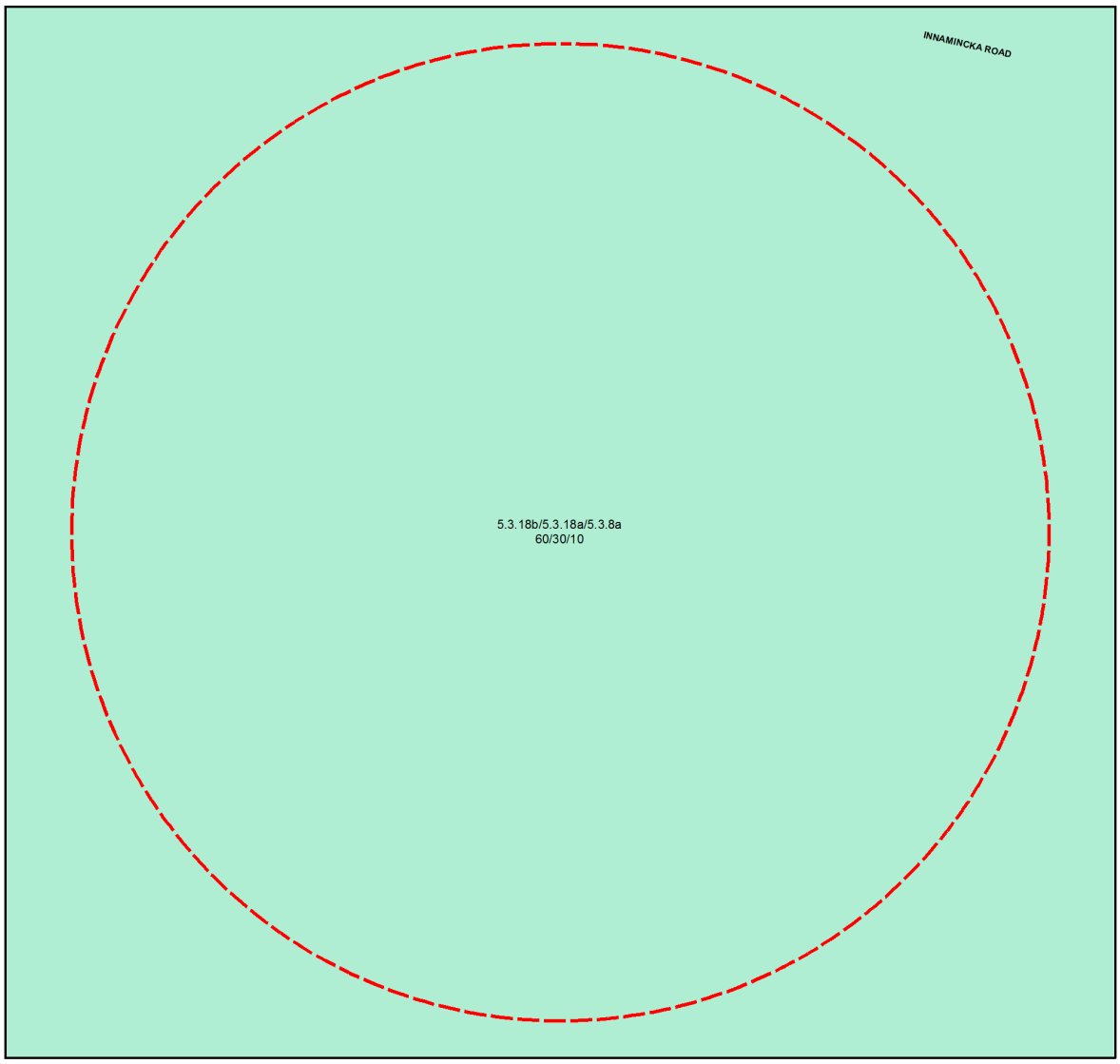
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.

Non-remnant vegetation includes regrowth and disturbed native vegetation.

This product is projected into GDA 1994 Queensland Albers

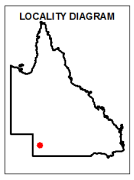
Map 3 - Pre-clearing regional ecosystems

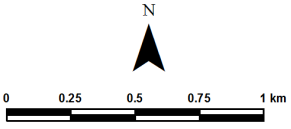


Pre-clearing Regional Ecosystems

Biodiversity Status

- 2 kilometre buffer
- Endangered - Dominant vegetation
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- No concern at present
- Water
- Cadastral Boundaries





This product is projected into GDA 1994 Queensland Albers

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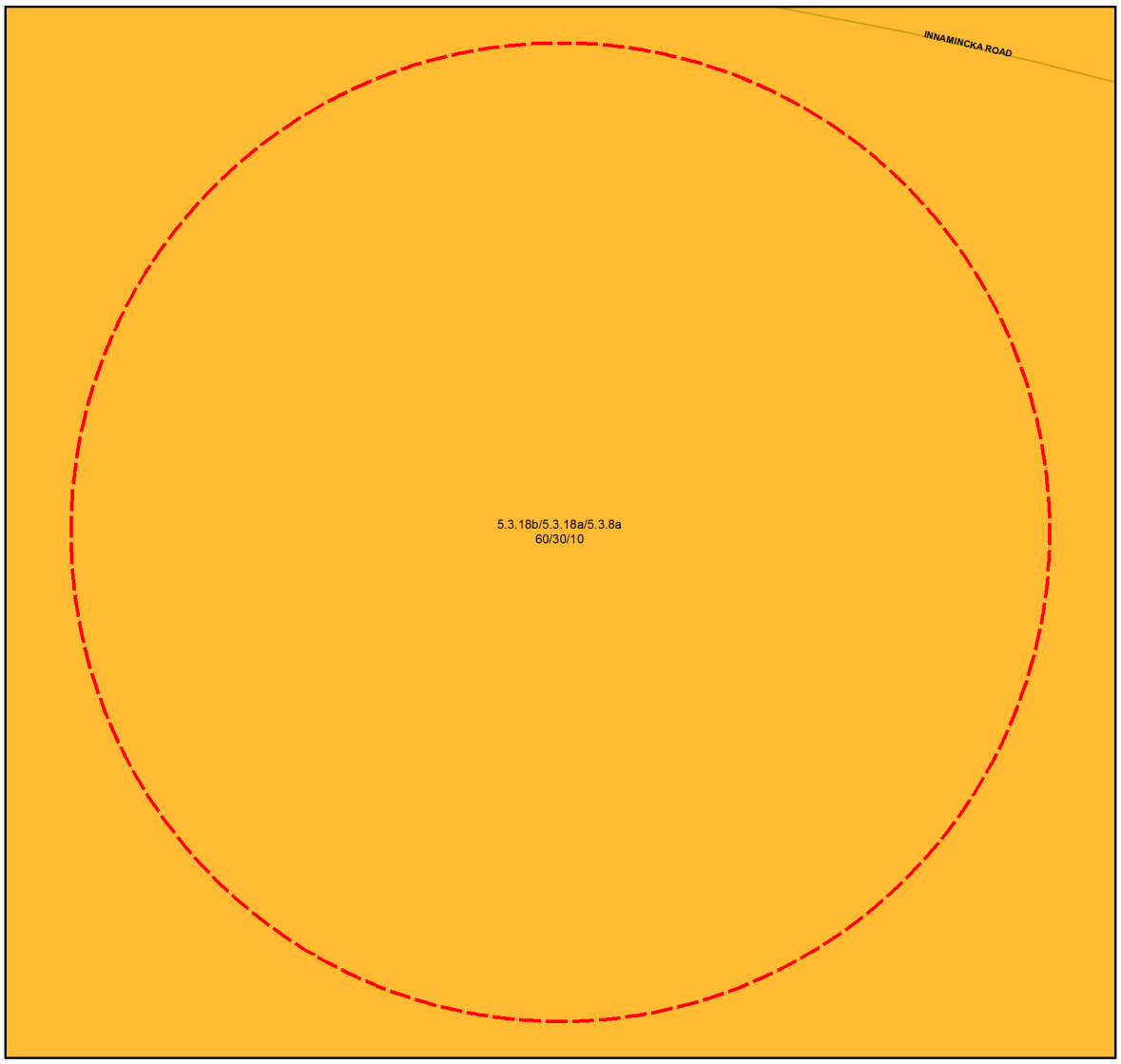
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

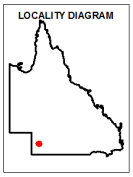
Map 4 - Remnant 2021 regional ecosystems by BVG (5M)

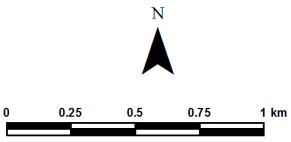


Remnant 2021 Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups
BVG5M Description (BVG1M codes)

- 2 kilometre buffer
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22c)
- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
- Water
- Cadastral Boundaries

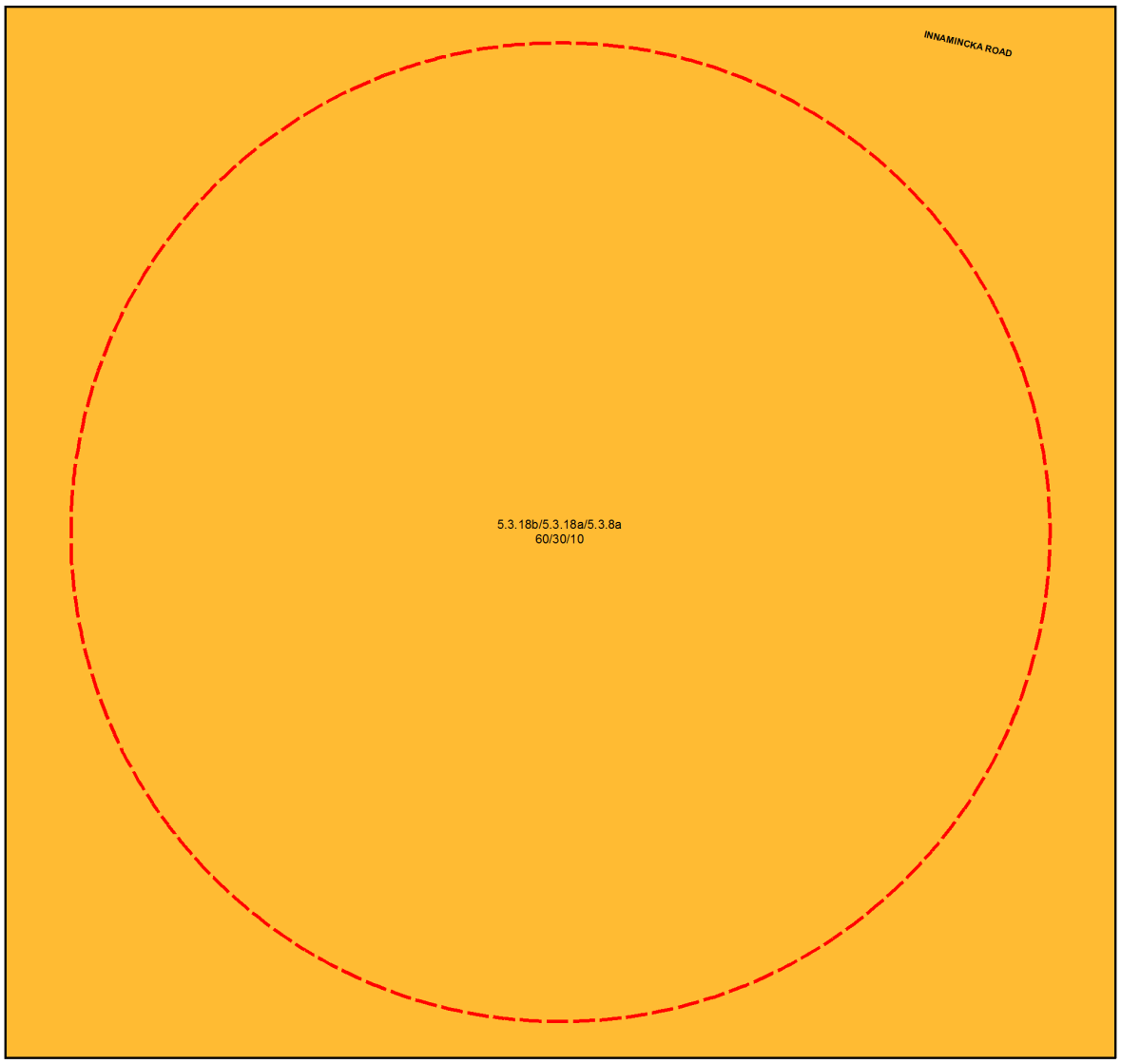




This product is projected into GDA 1994 Queensland Albers

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.
The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.
Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.
Non-remnant vegetation includes regrowth and disturbed native vegetation.

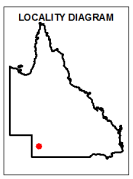
Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups
BVG5M Description (BVG1M codes)

- 2 kilometre buffer
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22c)
- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Water
- Cadastral Boundaries



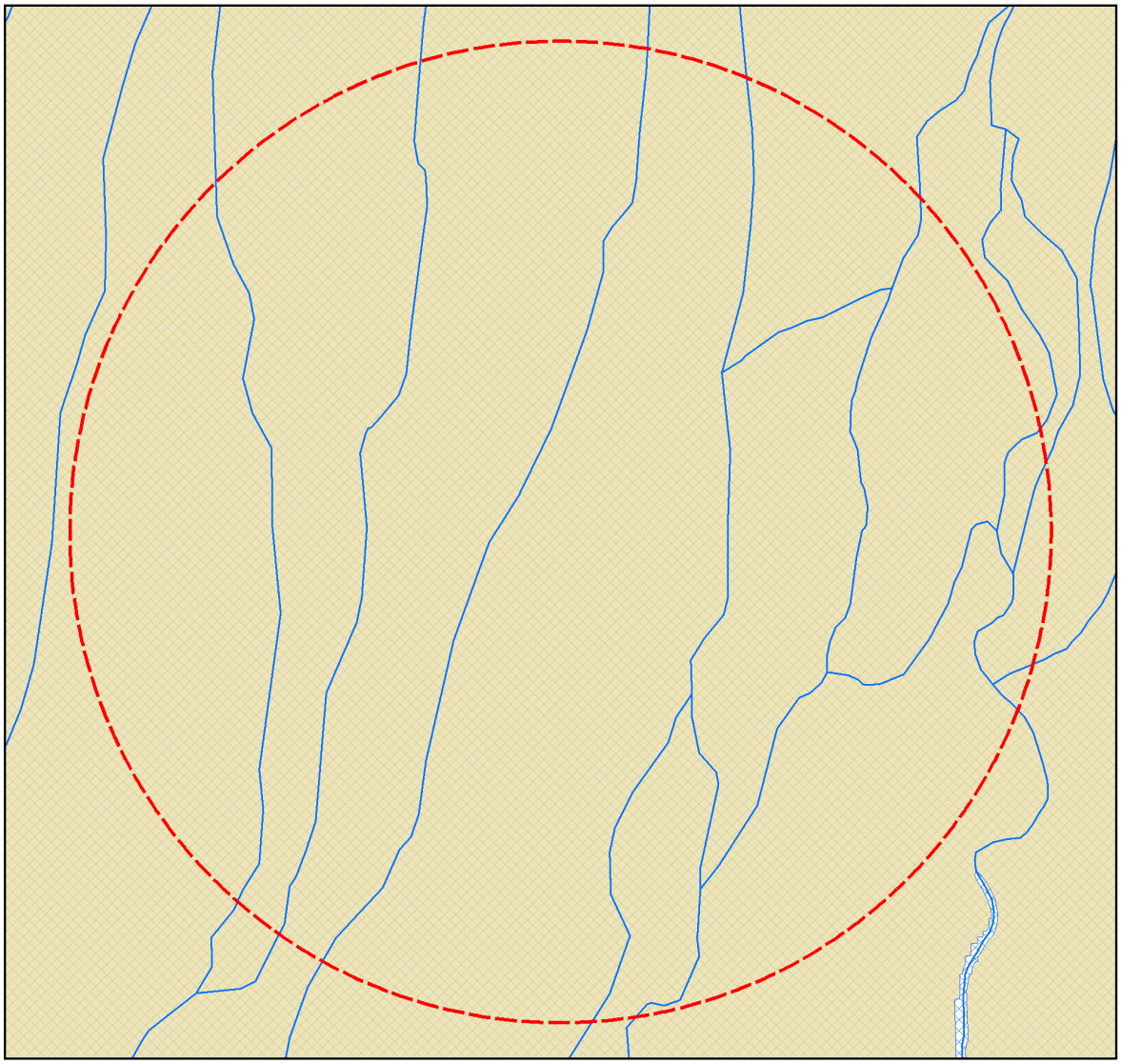
N

0 0.25 0.5 0.75 1 km

This product is projected into GDA 1994 Queensland Albers

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.
The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

Map 6 - Wetlands and waterways



Legend

2 kilometre buffer

Towns

Queensland Wetland Data

Riverine Drainage Lines

Springs

Wetland Type

Hydrologically natural Wetlands

Lacustrine Wetlands (hydrologically natural)

Palustrine Wetlands (hydrologically natural)

Riverine Wetlands (hydrologically natural)

Intertidal Wetlands (hydrologically natural)

Subtidal Wetlands (hydrologically natural)

Intertidal/Subtidal Wetlands (hydrologically natural)

Hydrologically Modified and Artificial Wetlands

Lacustrine Wetlands (hydrologically modified or artificial)

Palustrine Wetlands (hydrologically modified or artificial)

Riverine Wetlands (hydrologically modified or artificial)

Intertidal Wetlands (hydrologically modified or artificial)

Subtidal Wetlands (hydrologically modified or artificial)

Intertidal/Subtidal Wetlands (hydrologically modified or artificial)

Subdominant Wetlands

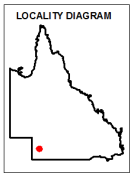
Subdominant Wetlands (51 - 80%)

Contains Wetlands

Contains Wetlands (1 - 50%)

Queensland Wetland Data

LOCALITY DIAGRAM



N

Accuracy information: The positional accuracy of wetland data mapped at a scale of 1:100,000 is +/-100m with a minimum polygon size of 5ha or 75m wide for linear features, except for areas along the east coa st which are mapped at the 1:50,000 scale with a positional accuracy of +/-50m, with a minimum polygon size of 1ha or 35m wide for linear features. Wetlands smaller than 1ha are not delineated on the wetland data. Consideration of the effects of mapped scale is necessary when interpret ing data at a larger scale, e.g. 1:25,000. For property assessment, digital linework should be used as a guide only. The extent of wetlands depicted on this map is based on rectified 2013 Landsat ETM+ imagery supplied by Statewide Landcover and Trees Study (SLATS), Department of Environment and Science. The extent of water bodies is based on the maximum extent of inundation derived from available Landsat imagery up to and including the 2013 imagery.

0 240 480 720 960 1200 m

This product is projected into GDA 1994 Queensland Albers

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:

https://qldglobe.information.qld.gov.au/

References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2023). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 6.0. 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. (2022). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 6.0. Updated April 2022. 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:

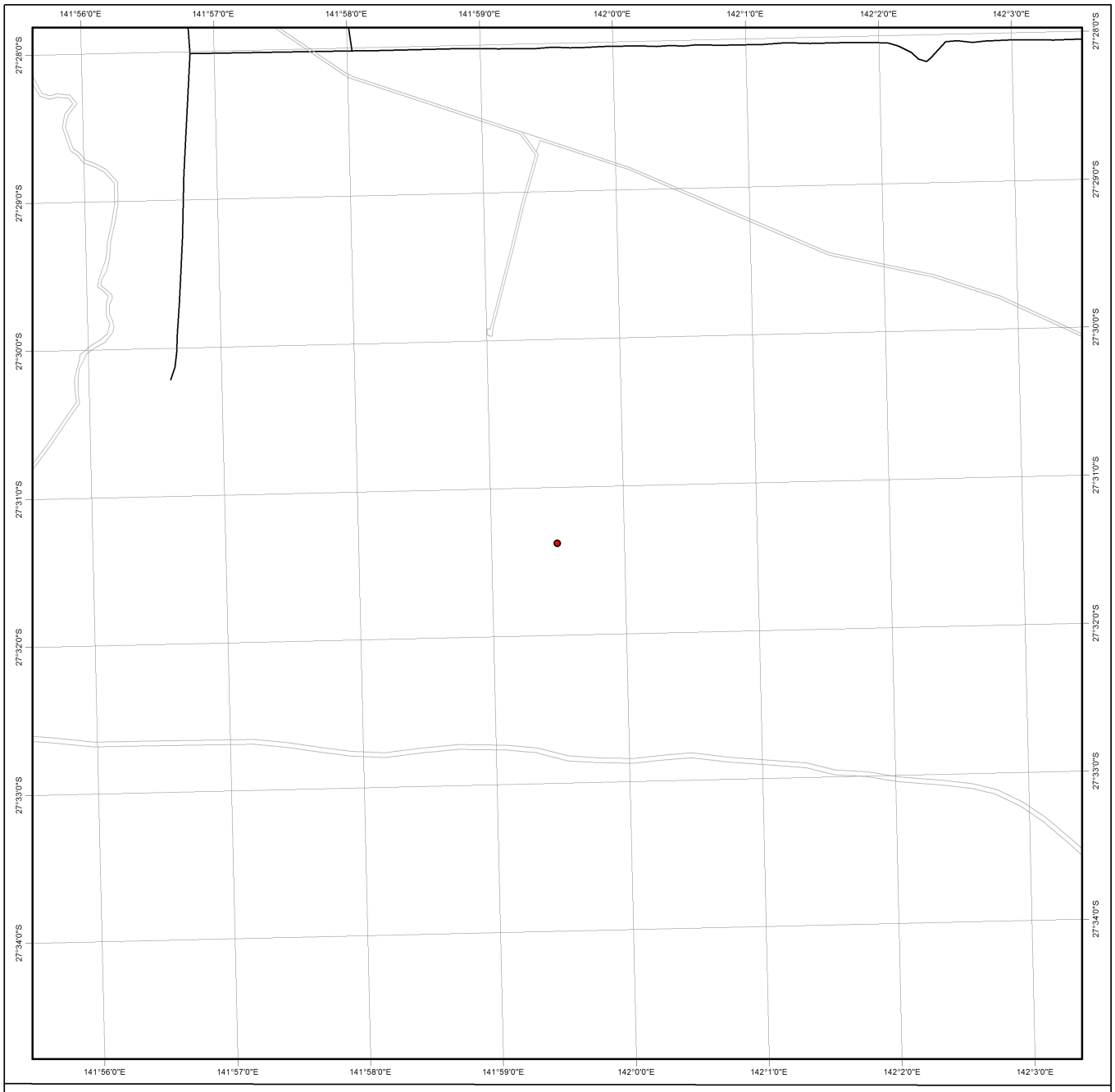
http://dds.information.qld.gov.au/dds/

- Biodiversity status of pre-clearing and 2021 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*

07/12/2023 19:40:40
Longitude: 141.9915788 Latitude: -27.5229664

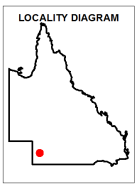


Protected Plants Flora Survey Trigger Map

Legend

- Coordinates
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets

LOCALITY DIAGRAM



N

0 480 960 1,440 1,920 2,400 m

This product is projected into:
GDA 1994 Queensland Albers

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.

Protected plants flora survey trigger map

The protected plants flora survey trigger map identifies 'high risk areas' where threatened and near threatened plants are known to exist or are likely to exist. Under the *Nature Conservation Act 1992* (the Act) it is an offence to clear protected plants that are 'in the wild' unless you are authorised or the clearing is exempt, for more information see section 89 of the Act.

Please see the Department of Environment and Science webpage on the clearing of protected plants for information on what exemptions may apply in your circumstances, whether you may need to undertake a flora survey, and whether you may need a protected plants clearing permit.

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.

Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: All
Records: Confirmed
Date: Since 1980
Latitude: -27.5229
Longitude: 141.9916
Distance: 50
Email: teresa.carvalho@ecoaus.com.au
Date submitted: Friday 01 Dec 2023 16:42:14
Date extracted: Friday 01 Dec 2023 16:50:02

The number of records retrieved = 333

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		7
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		3
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		5
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		5
animals	amphibians	Myobatrachidae	*Crinia deserticola*	chirping froglet		C		2
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		2
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		1
animals	birds	Accipitridae	*Circus approximans*	swamp harrier		C		1
animals	birds	Accipitridae	*Circus assimilis*	spotted harrier		C		1
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		3
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		1
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		1
animals	birds	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher		C		1
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		2
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		1
animals	birds	Anatidae	*Aythya australis*	hardhead		C		1
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		2
animals	birds	Anatidae	*Malacorhynchus membranaceus*	pink-eared duck		C		1
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		1
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		1
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		1
animals	birds	Artamidae	*Artamus cinereus*	black-faced woodswallow		C		1
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		3
animals	birds	Artamidae	*Artamus personatus*	masked woodswallow		C		2
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		3
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		2
animals	birds	Campephagidae	*Coracina maxima*	ground cuckoo-shrike		C		1
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		2
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		2
animals	birds	Columbidae	*Geopelia cuneata*	diamond dove		C		2
animals	birds	Columbidae	*Geopelia placida*	peaceful dove		C		1
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		3
animals	birds	Corvidae	*Corvus bennetti*	little crow		C		1
animals	birds	Corvidae	*Corvus coronoides*	Australian raven		C		3
animals	birds	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird		C		2
animals	birds	Estrildidae	*Taeniopygia guttata*	zebra finch		C		7
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		1
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		2
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		1
animals	birds	Glareolidae	*Stiltia isabella*	Australian pratincole		C		1
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		1
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		4
animals	birds	Locustellidae	*Cincloramphus cruralis*	brown songlark		C		1
animals	birds	Locustellidae	*Cincloramphus mathewsi*	rufous songlark		C		2
animals	birds	Maluridae	*Malurus assimilis*	purple-backed fairy-wren		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Maluridae	*Malurus leucopterus*	white-winged fairy-wren		C		2
animals	birds	Meliphagidae	*Ashbyia lovensis*	gibberbird		C		1
animals	birds	Meliphagidae	*Epthianura tricolor*	crimson chat		C		2
animals	birds	Meliphagidae	*Gavicalis virescens*	singing honeyeater		C		1
animals	birds	Meliphagidae	*Ptilotula penicillata*	white-plumed honeyeater		C		4
animals	birds	Meliphagidae	*Sugomel nigrum*	black honeyeater		C		1
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		1
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		1
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		2
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		2
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		1
animals	birds	Pomatostomidae	*Pomatostomus ruficeps*	chestnut-crowned babbler		C		1
animals	birds	Psittaculidae	*Melopsittacus undulatus*	budgerigar		C		4
animals	birds	Psittaculidae	*Neopsephotus bourkii*	Bourke's parrot		C		2
animals	birds	Psittaculidae	*Northiella haematogaster*	blue bonnet		C		2
animals	birds	Psophodidae	*Psophodes cristatus*	chirruping wedgebill		C		2
animals	birds	Recurvirostridae	*Recurvirostra novaehollandiae*	red-necked avocet		C		1
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		4
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		1
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		1
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		1
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		1
animals	mammals	Dasyuridae	*Ningaui ridei*	wongai ningaui		C		1
animals	mammals	Dasyuridae	*Planigale ingrami*	long-tailed planigale		C		1
animals	mammals	Dasyuridae	*Planigale tenuirostris*	narrow-nosed planigale		C		16
animals	mammals	Dasyuridae	*Sminthopsis crassicaudata*	fat-tailed dunnart		C		1
animals	mammals	Dasyuridae	*Sminthopsis macroura*	stripe-faced dunnart		C		35
animals	mammals	Macropodidae	*Osphranter rufus*	red kangaroo		C		1
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		1
animals	mammals	Muridae	*Leggadina forresti*	Forrest's mouse		C		3
animals	mammals	Muridae	*Pseudomys desertor*	desert mouse		C		23
animals	mammals	Muridae	*Pseudomys hermannsburgensis*	sandy inland mouse		C		2
animals	mammals	Muridae	*Rattus villosissimus*	long-haired rat		C		64
animals	reptiles	Agamidae	*Amphibolurus burnsi*	Burns's dragon		C		1
animals	reptiles	Agamidae	*Ctenophorus isolepis*	military dragon		C		10
animals	reptiles	Agamidae	*Ctenophorus nuchalis*	central netted dragon		C		21
animals	reptiles	Agamidae	*Ctenophorus pictus*	painted dragon		C		5
animals	reptiles	Agamidae	*Diporiphora winneckei*	canegrass dragon		C		2
animals	reptiles	Agamidae	*Pogona vitticeps*	central bearded dragon		C		69
animals	reptiles	Agamidae	*Tympanocryptis intima*	gibber earless dragon		C		19
animals	reptiles	Agamidae	*Tympanocryptis tetraporophora*	Eyrean earless dragon		C		19
animals	reptiles	Boidae	*Antaresia childreni*	children's python		C		5
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		1
animals	reptiles	Carphodactylidae	*Nephrurus levis*	three-lined knob-tail		C		12
animals	reptiles	Chelidae	*Emydura macquarii emmotti*	Emmott's short-neck turtle		C		8/7
animals	reptiles	Diplodactylidae	*Diplodactylus ameyi*	eastern deserts fat-tailed gecko		C		8/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Diplodactylidae	*Diplodactylus tessellatus*	tessellated gecko		C		9
animals	reptiles	Diplodactylidae	*Lucasium damaeum*	beaded gecko		C		1
animals	reptiles	Diplodactylidae	*Strophurus ciliaris*	spiny-tailed gecko		C		9
animals	reptiles	Diplodactylidae	*Strophurus elderi*	jewelled gecko		C		12
animals	reptiles	Elapidae	*Brachyurophis fasciolatus*	narrow-banded snake		C		1
animals	reptiles	Elapidae	*Demansia cyanochasma*	desert whip snake		C		5
animals	reptiles	Elapidae	*Demansia rimicola*	soil-crack whipsnake		C		3
animals	reptiles	Elapidae	*Pseudechis australis*	king brown snake		C		29
animals	reptiles	Elapidae	*Pseudonaja aspidorhyncha*	strap-snouted brown snake		C		1
animals	reptiles	Elapidae	*Pseudonaja guttata*	speckled brown snake		C		13
animals	reptiles	Elapidae	*Pseudonaja mengdeni*	Mengden's brown snake		C		17
animals	reptiles	Elapidae	*Pseudonaja modesta*	ringed brown snake		C		10
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		24
animals	reptiles	Elapidae	*Suta suta*	myall snake		C		17
animals	reptiles	Gekkonidae	*Gehyra versicolor*			C		13
animals	reptiles	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko		C		6
animals	reptiles	Pygopodidae	*Delma butleri*	unbanded delma		C		19
animals	reptiles	Pygopodidae	*Delma tincta*	excitable delma		C		1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		25
animals	reptiles	Pygopodidae	*Pygopus nigriceps sensu lato*	hooded scaly-foot		C		7
animals	reptiles	Pygopodidae	*Pygopus schraderi*	eastern hooded scaly-foot		C		1
animals	reptiles	Scincidae	*Austroablepharus kinghorni*	red-tailed soil-crevice skink		C		1
animals	reptiles	Scincidae	*Ctenotus ariadnae*	Ariadna's ctenotus		C		1
animals	reptiles	Scincidae	*Ctenotus inornatus*	bar-shouldered ctenotus		C		1
animals	reptiles	Scincidae	*Ctenotus leonhardii*	Leonhardi's ctenotus		C		20
animals	reptiles	Scincidae	*Ctenotus pantherinus*	leopard ctenotus		C		17
animals	reptiles	Scincidae	*Ctenotus regius*	pale-rumped ctenotus		C		14
animals	reptiles	Scincidae	*Ctenotus schomburgkii*	Schomburgk's ctenotus		C		3
animals	reptiles	Scincidae	*Ctenotus strauchii*	eastern barred wedgesnout ctenotus		C		3
animals	reptiles	Scincidae	*Cyclodomorphus venustus*	saltbush slender bluetongue		C		3
animals	reptiles	Scincidae	*Eremiascincus phantasmus*	ghost skink		C		13
animals	reptiles	Scincidae	*Eremiascincus richardsonii*	broad-banded sand swimmer		C		2
animals	reptiles	Scincidae	*Tiliqua multifasciata*	Centralian blue-tongued lizard		C		18
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		2
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		30
plants	land plants	Acanthaceae	*Dipteracanthus australasicus subsp. australasicus*			C		3/3
plants	land plants	Acanthaceae	*Rostellularia adscendens subsp. adscendens*			C		1/1
plants	land plants	Aizoaceae	*Tetragonia moorei*			C		2/2
plants	land plants	Aizoaceae	*Trianthema triquetra*	red spinach		C		1/1
plants	land plants	Amaranthaceae	*Alternanthera nodiflora*	joyweed		C		1/1
plants	land plants	Amaranthaceae	*Amaranthus mitchellii*	Boggabri weed		C		1/1
plants	land plants	Amaranthaceae	*Ptilotus macrocephalus*	green pussytails		C		1/1
plants	land plants	Amaranthaceae	*Ptilotus murrayi*			C		1/1
plants	land plants	Amaranthaceae	*Ptilotus obovatus*			C		4/4
plants	land plants	Amaranthaceae	*Ptilotus polystachyus*			C		1/1
plants	land plants	Apiaceae	*Eryngium supinum*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Asphodelaceae	*Bulbine alata*	native leek		C		1/1
plants	land plants	Asteraceae	*Brachyscome ciliaris*			C		1/1
plants	land plants	Asteraceae	*Brachyscome eriogona*			C		1/1
plants	land plants	Asteraceae	*Brachyscome rara*			C		1/1
plants	land plants	Asteraceae	*Calocephalus platycephalus*	yellow top		C		2/2
plants	land plants	Asteraceae	*Calotis hispidula*	bogan flea		C		1/1
plants	land plants	Asteraceae	*Calotis plumulifera*			C		2/2
plants	land plants	Asteraceae	*Calotis porphyroglossa*	channel burr daisy		C		1/1
plants	land plants	Asteraceae	*Centipeda pleiocephala*			C		2/2
plants	land plants	Asteraceae	*Leiocarpa brevicompta*			C		3/3
plants	land plants	Asteraceae	*Leucochrysum stipitatum*			C		1/1
plants	land plants	Asteraceae	*Minuria denticulata*			C		1/1
plants	land plants	Asteraceae	*Minuria integerrima*	smooth minuria		C		1/1
plants	land plants	Asteraceae	*Myriocephalus puriflorus*			C		1/1
plants	land plants	Asteraceae	*Polycalymma stuartii*			C		2/2
plants	land plants	Asteraceae	*Pterocaulon sphacelatum*	applebush		C		1/1
plants	land plants	Asteraceae	*Pycnosorus eremaeus*			C		2/2
plants	land plants	Asteraceae	*Pycnosorus melleus*			C		1/1
plants	land plants	Asteraceae	*Rhodanthe floribunda*			C		3/3
plants	land plants	Asteraceae	*Rhodanthe microglossa*	clustered sunray		C		1/1
plants	land plants	Asteraceae	*Rhodanthe moschata*			C		1/1
plants	land plants	Asteraceae	*Rhodanthe stricta*	slender sunray		C		1/1
plants	land plants	Asteraceae	*Roebuckiella similis*			C		1/1
plants	land plants	Asteraceae	*Rutidosis helichrysoides subsp. acutiglumis*			C		1/1
plants	land plants	Asteraceae	*Rutidosis helichrysoides subsp. helichrysoides*			C		1/1
plants	land plants	Asteraceae	*Senecio depressicola*			C		5/5
plants	land plants	Asteraceae	*Senecio glossanthus*	slender groundsel		C		1/1
plants	land plants	Asteraceae	*Senecio gregorii*			C		2/2
plants	land plants	Asteraceae	*Sonchus oleraceus*	common sowthistle	Y			5/5
plants	land plants	Boraginaceae	*Halgania cyanea*			C		2/2
plants	land plants	Boraginaceae	*Trichodesma zeylanicum var. zeylanicum*			C		1/1
plants	land plants	Brassicaceae	*Harmsiodoxa puberula*			C		1/1
plants	land plants	Brassicaceae	*Lemphoria eremigena*			C		1/1
plants	land plants	Brassicaceae	*Lepidium phlebopetalum*	veined peppercress		C		1/1
plants	land plants	Brassicaceae	*Rorippa eustylis*			C		1/1
plants	land plants	Brassicaceae	*Stenopetalum lineare*			C		1/1
plants	land plants	Brassicaceae	*Stenopetalum nutans*			C		2/2
plants	land plants	Byttneriaceae	*Commersonia loxophylla*			C		1/1
plants	land plants	Campanulaceae	*Isotoma petraea*	rock isotome		SL		2/2
plants	land plants	Capparaceae	*Capparis loranthifolia var. loranthifolia*			C		1/1
plants	land plants	Capparaceae	*Capparis mitchellii*			C		1/1
plants	land plants	Caryophyllaceae	*Stellaria angustifolia subsp. angustifolia*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex angulata*	fan saltbush		C		2/2
plants	land plants	Chenopodiaceae	*Atriplex crassipes var. crassipes*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex elachophylla*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex fissivalvis*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Chenopodiaceae	*Atriplex holocarpa*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex limbata*			C		2/2
plants	land plants	Chenopodiaceae	*Atriplex lindleyi*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex lobativalvis*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex spongiosa*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex vesicaria*			C		1/1
plants	land plants	Chenopodiaceae	*Chenopodium auricomum*			C		1/1
plants	land plants	Chenopodiaceae	*Dissocarpus biflorus var. biflorus*			C		1/1
plants	land plants	Chenopodiaceae	*Dissocarpus fontinalis*			C		1/1
plants	land plants	Chenopodiaceae	*Enchylaena tomentosa var. tomentosa*			C		3/3
plants	land plants	Chenopodiaceae	*Maireana coronata*			C		2/2
plants	land plants	Chenopodiaceae	*Maireana georgei*			C		2/2
plants	land plants	Chenopodiaceae	*Malacocera tricornis*	soft horns		C		1/1
plants	land plants	Chenopodiaceae	*Neobassia proceriflora*	soda bush		C		1/1
plants	land plants	Chenopodiaceae	*Salsola australis*			C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena*					1/1
plants	land plants	Chenopodiaceae	*Sclerolaena bicornis var. bicornis*			C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena brachyptera*			C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena calcarata*	red burr		C		2/2
plants	land plants	Chenopodiaceae	*Sclerolaena diacantha*	grey copper burr		C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena minuta*			C		1/1
plants	land plants	Chenopodiaceae	*Sclerolaena parallelicuspis*			C		1/1
plants	land plants	Convolvulaceae	*Convolvulus clementii*			C		1/1
plants	land plants	Convolvulaceae	*Ipomoea diamantinensis*	desert cowvine		C		1/1
plants	land plants	Cyperaceae	*Cyperus bifax*	western nutgrass		C		1/1
plants	land plants	Cyperaceae	*Cyperus dactylotes*			C		2/2
plants	land plants	Cyperaceae	*Cyperus difformis*	rice sedge		C		1/1
plants	land plants	Cyperaceae	*Eleocharis acuta*			C		1/1
plants	land plants	Cyperaceae	*Eleocharis pallens*	pale spikerush		C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia dallachyana*			C		2/2
plants	land plants	Euphorbiaceae	*Euphorbia inappendiculata var. queenslandica*			C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia papillata var. papillata*			C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia stevenii*	bottle tree spurge		C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*			C		1/1
plants	land plants	Euphorbiaceae	*Euphorbia thelephora var. thelephora*			C		2/2
plants	land plants	Euphorbiaceae	*Euphorbia wheeleri*			C		1/1
plants	land plants	Frankeniaceae	*Frankenia serpyllifolia*			C		3/3
plants	land plants	Geraniaceae	*Erodium cygnorum*			C		1/1
plants	land plants	Goodeniaceae	*Goodenia fascicularis*			C		1/1
plants	land plants	Goodeniaceae	*Goodenia lunata*			C		2/2
plants	land plants	Goodeniaceae	*Scaevola humilis*			C		1/1
plants	land plants	Goodeniaceae	*Scaevola parvibarbata*			C		1/1
plants	land plants	Goodeniaceae	*Scaevola spinescens*	prickly fan flower		C		1/1
plants	land plants	Haloragaceae	*Haloragis aspera*	raspweed		C		1/1
plants	land plants	Haloragaceae	*Haloragis glauca forma glauca*			C		3/3
plants	land plants	Haloragaceae	*Haloragis gossei*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Lamiaceae	*Dicrastylis lewellinii*			C		1/1
plants	land plants	Lamiaceae	*Teucrium racemosum*			C		2/2
plants	land plants	Leguminosae	*Acacia aneura*			C		2/2
plants	land plants	Leguminosae	*Acacia cambagei*	gidgee		C		1/1
plants	land plants	Leguminosae	*Acacia clivicola*			C		1/1
plants	land plants	Leguminosae	*Acacia cyperophylla var. cyperophylla*	minniritchie		C		1/1
plants	land plants	Leguminosae	*Acacia dictyophleba*			C		1/1
plants	land plants	Leguminosae	*Acacia ligulata*			C		4/4
plants	land plants	Leguminosae	*Acacia murrayana*			C		1/1
plants	land plants	Leguminosae	*Acacia salicina*	doolan		C		1/1
plants	land plants	Leguminosae	*Acacia stenophylla*	belalie		C		1/1
plants	land plants	Leguminosae	*Acacia tetragonophylla*	dead finish		C		2/2
plants	land plants	Leguminosae	*Acacia victoriae subsp. arida*			C		2/2
plants	land plants	Leguminosae	*Acacia victoriae subsp. victoriae*			C		2/2
plants	land plants	Leguminosae	*Crotalaria eremaea subsp. eremaea*			C		1/1
plants	land plants	Leguminosae	*Cullen australasicum*			C		1/1
plants	land plants	Leguminosae	*Cullen cinereum*			C		1/1
plants	land plants	Leguminosae	*Cullen graveolens*			C		1/1
plants	land plants	Leguminosae	*Glycine canescens*	silky glycine		C		1/1
plants	land plants	Leguminosae	*Indigofera leucotricha*			C		1/1
plants	land plants	Leguminosae	*Lysiphyllum gilvum*	bauhinia		C		2/2
plants	land plants	Leguminosae	*Neptunia xanthonema*			C		1/1
plants	land plants	Leguminosae	*Senna artemisioides subsp. artemisioides*			C		1/1
plants	land plants	Leguminosae	*Senna artemisioides subsp. helmsii*			C		1/1
plants	land plants	Leguminosae	*Senna artemisioides subsp. oligophylla*			C		2/2
plants	land plants	Leguminosae	*Senna artemisioides subsp. sturtii*			C		1/1
plants	land plants	Leguminosae	*Senna artemisioides subsp. zygophylla*			C		1/1
plants	land plants	Leguminosae	*Senna glutinosa subsp. pruinosa*			C		1/1
plants	land plants	Leguminosae	*Senna phyllodinea*			C		1/1
plants	land plants	Leguminosae	*Swainsona campylantha*			C		2/2
plants	land plants	Leguminosae	*Trigonella suavissima*			C		1/1
plants	land plants	Leguminosae	*Vachellia farnesiana*		Y			3/3
plants	land plants	Loranthaceae	*Amyema miraculosa subsp. boormanii*			C		1/1
plants	land plants	Loranthaceae	*Amyema preissii*			C		1/1
plants	land plants	Loranthaceae	*Amyema quandang var. quandang*			C		2/2
plants	land plants	Loranthaceae	*Lysiana exocarpi subsp. exocarpi*			C		1/1
plants	land plants	Malvaceae	*Abutilon calliphyllum*	velvet lanternflower		C		1/1
plants	land plants	Malvaceae	*Abutilon fraseri subsp. fraseri*			C		1/1
plants	land plants	Malvaceae	*Abutilon leucopetalum*			C		2/2
plants	land plants	Malvaceae	*Abutilon macrum*			C		1/1
plants	land plants	Malvaceae	*Abutilon otocarpum*			C		1/1
plants	land plants	Malvaceae	*Gossypium sturtianum*			C		1/1
plants	land plants	Malvaceae	*Hibiscus verdcourtii*			C		1/1
plants	land plants	Malvaceae	*Malva preissiana*			C		1/1
plants	land plants	Malvaceae	*Malvastrum americanum var. americanum*		Y			2/2
plants	land plants	Malvaceae	*Sida fibulifera*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Malvaceae	*Sida sp. (Musselbrook M.B.Thomas+ MRS437)*			C		1/1
plants	land plants	Molluginaceae	*Glinus lotoides*	hairy carpet weed		C		1/1
plants	land plants	Myrtaceae	*Corymbia terminalis*			C		2/2
plants	land plants	Myrtaceae	*Eucalyptus camaldulensis subsp. arida*			C		2/2
plants	land plants	Myrtaceae	*Eucalyptus coolabah*	coolabah		C		2/2
plants	land plants	Myrtaceae	*Eucalyptus saligna*			C		2
plants	land plants	Pedaliaceae	*Josephinia eugeniae*	josephinia burr		C		1/1
plants	land plants	Phrymaceae	*Mimulus*					1/1
plants	land plants	Phrymaceae	*Peplidium foecundum*			C		1/1
plants	land plants	Phyllanthaceae	*Synostemon rhytidospermus*			C		1/1
plants	land plants	Plantaginaceae	*Plantago drummondii*			C		1/1
plants	land plants	Poaceae	*Aristida contorta*	bunched kerosene grass		C		1/1
plants	land plants	Poaceae	*Cenchrus ciliaris*		Y			1/1
plants	land plants	Poaceae	*Chloris pectinata*	comb chloris		C		1/1
plants	land plants	Poaceae	*Cymbopogon obtectus*			C		1/1
plants	land plants	Poaceae	*Diplachne fusca var. fusca*			C		1/1
plants	land plants	Poaceae	*Echinochloa turneriana*	channel millet		C		1/1
plants	land plants	Poaceae	*Elytrophorus spicatus*			C		1/1
plants	land plants	Poaceae	*Enneapogon nigricans*	niggerheads		C		1/1
plants	land plants	Poaceae	*Enneapogon polyphyllus*	leafy nineawn		C		1/1
plants	land plants	Poaceae	*Eragrostis confertiflora*			C		2/2
plants	land plants	Poaceae	*Eragrostis eriopoda*			C		1/1
plants	land plants	Poaceae	*Eragrostis laniflora*			C		2/2
plants	land plants	Poaceae	*Eragrostis pergracilis*			C		2/2
plants	land plants	Poaceae	*Eragrostis setifolia*			C		2/2
plants	land plants	Poaceae	*Eragrostis xerophila*			C		1/1
plants	land plants	Poaceae	*Lachnagrostis filiformis*			C		1/1
plants	land plants	Poaceae	*Plagiosetum refractum*			C		1/1
plants	land plants	Poaceae	*Poa fordeana*	sweet swampgrass		C		2/2
plants	land plants	Poaceae	*Triodia basedowii*			C		2/2
plants	land plants	Poaceae	*Urochloa subquadripara*		Y			1/1
plants	land plants	Polygonaceae	*Duma florulenta*			C		1/1
plants	land plants	Polygonaceae	*Rumex crystallinus*	shiny dock		C		1/1
plants	land plants	Portulacaceae	*Calandrinia balonensis*	broad-leaved parakeelya		C		2/2
plants	land plants	Portulacaceae	*Calandrinia ptychosperma*			C		2/2
plants	land plants	Proteaceae	*Hakea eyreana*			C		5/5
plants	land plants	Proteaceae	*Hakea leucoptera*			C		1/1
plants	land plants	Pteridaceae	*Cheilanthes sieberi subsp. sieberi*			C		1/1
plants	land plants	Rubiaceae	*Asperula gemella*			C		2/2
plants	land plants	Rubiaceae	*Psydrax latifolia*			C		1/1
plants	land plants	Rutaceae	*Citrus glauca*			C		1/1
plants	land plants	Santalaceae	*Santalum lanceolatum*			SL		1/1
plants	land plants	Sapindaceae	*Atalaya hemiglauca*			C		1/1
plants	land plants	Sapindaceae	*Dodonaea viscosa subsp. angustissima*			C		5/5
plants	land plants	Scrophulariaceae	*Eremophila bignoniiflora*	eurah		C		1/1
plants	land plants	Scrophulariaceae	*Eremophila dalyana*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Scrophulariaceae	*Eremophila duttonii*			C		1/1
plants	land plants	Scrophulariaceae	*Eremophila gilesii subsp. gilesii*	Charleville turkeybush		C		1/1
plants	land plants	Scrophulariaceae	*Eremophila longifolia*	berrigan		C		1/1
plants	land plants	Solanaceae	*Cestrum parqui*	green cestrum	Y			1/1
plants	land plants	Solanaceae	*Nicotiana velutina*			C		1/1
plants	land plants	Solanaceae	*Solanum*					1/1
plants	land plants	Solanaceae	*Solanum nigrum*		Y			1/1
plants	land plants	Solanaceae	*Solanum sturtianum*	thargomindah nightshade		C		1/1
plants	land plants	Stylidiaceae	*Stylidium desertorum*			SL		1/1
plants	land plants	Zygophyllaceae	*Roepera apiculata*			C		1/1
plants	land plants	Zygophyllaceae	*Roepera iodocarpa*			C		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 (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

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

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix B Likelihood of occurrence assessment

Scientific name	Common name	EPBC status	NC status	Habitat description	Likelihood of occurrence	Likelihood of occurrence justification
Mammals						
Macroderma gigas	Ghost bat	V	E	Three population centres are identified, the Northern Pilbara and Kimberley in Western Australia, the Top End of the continent and in Queensland. Caves namely caves with multiple entrance ways, sheltered rock crevices, boulder piles or disused mines are favored daytime roosts; occupation of abandoned buildings is only occasionally reported. The species changes locations seasonally. During breeding season, from late October to early November, female bats congregate in maternity colonies.	Unlikely	Closest record approximately 77.75 km NE of study area. Field surveys identified no suitable habitat present within the study area or surrounds. Specifically, no caves or sheltered rock crevices were present within the study area.
Notomys fuscus	Dusky hopping-mouse	V	E	The species is predominantly restricted to the dune crests with only a few observations of the species in the surrounding gibber areas or inter-dune swales and scalded areas. The dusky hopping-mouse does move across inter-dune clay flats within their home range (Moseby et al. 1999). *Nitraria billardere*i and sandhill canegrass (*Zygochloa paradoxa*) may be important in supporting persistent populations whose burrows were recorded amongst their hummocks. Population's numbers and occupation fluctuate, with density reductions or local extinction during dry periods and occurrence in atypical habitat such as chenopod shrubland on gibber plains, acacia shrubland and sandy creek lines (Val et al. 2012; Waudby & How 2008) after good seasons of rainfall. It has a patchy distribution in the arid areas of south-west Queensland, southern Northern Territory (historic), north-east South Australia and western New South Wales. Extensive surveys of suitable habitat confirmed that the species is patchily distributed and highly fragmented (Moseby et al. 1999), although the factors leading to this contemporary distribution pattern are not known. Knowledge of life expectancy and natural mortality of the species is limited.	Unlikely	Closest record approximately 238 km NW of study area. Field surveys confirmed no suitable dune habitat was present within the study area or surrounds.

Scientific name	Common name	EPBC status	NC status	Habitat description	Likelihood of occurrence	Likelihood of occurrence justification
Petrogale xanthopus celeris	Yellow-footed Rock-wallaby (central-western Queensland)	V	V	The species exhibits a restricted distribution across the mountain ranges of the central-western Queensland semi-arid zone (Van Dyck et al, 2013) including the Gowan, Grey, Cheviot, Yangang, Macedon, Edinburgh and McGregor Ranges, and Mariala National Park (TSSC, 2016a). predominant habitat includes rocky outcrops, sand dunes and dense shrubby areas. The species lives in colonies of 10 to over 100 individuals	Unlikely	Closest record approximately 123.22 km NE of study area. Field surveys confirmed there was no suitable habitat for this species within the study area. The study area comprised of flat shrubland and herbland with no rocky outcrops or sand dunes, therefore, no foraging habitat appeared to be present.
Pseudomys australis	Plains rat	V	V	Once occupying a wider variety of habitats including sand ridges and dense grasslands this nocturnal species is currently restricted to the gibber plains of Lake Eyre Basin in northern South Australia (Qld EPA 2008). Mostly recorded in stone-covered plains and mid slopes with boulders, small stones, and crackling clays (gilgais) (SAALNRM 2008). Also found on adjoining sandy plains in years of high rainfall (SAALNRM 2008). Low-lying gilgais and watercourses of gibbber plains may be core refuge areas when environmental conditions are adverse (SAALNRM 2008). Mostly recorded in regularly inundated areas, often for extended periods. The plains rat primary habitat was considered to be the drainage channels and depressions with deep friable gilgais. Secondary habitats were associated with gilgais and minor drainage areas with low perennial chenopod shrublands and heavier cracking clays (Brandle et al. 1999). Home ranges of radio-collared animals averaged 1850 m^2 in primary habitat and 6860 m^2 in secondary habitat (Brandle & Moseby 1999). The species builds shallow, complex burrows where nests are maintained by breeding females. Following wet periods, the Plains Rat can be extremely easy to detect, however, between periods of peak abundance, this species appears to become extremely scarce (Brandle et al. 1999).	Unlikely	Closest record approximately 208 km NW of study area (DES). Field surveys confirmed that no suitable habitat was present within the study area or surrounds. Specifically, no sand ridges or dense grasslands were identified within the study area.
Birds						
Amytornis barbatus barbatus	Bulloo grey grasswren	E	E	The Bulloo subspecies is confined to the Bulloo River drainage system in south-western Queensland and north-western NSW (TSSC 2005). The species has only been recorded in swampy floodplains along the Bulloo River in the arid channel country.	Known	This species was recorded during the field survey. Four individuals were observed inhabiting lignum within a dry watercourse.

Scientific name	Common name	EPBC status	NC status	Habitat description	Likelihood of occurrence	Likelihood of occurrence justification
Aphelocephala leucopsis	Southern whiteface	V	V	The species is considered to be sedentary and has been recorded in arid open woodlands with a shrubby or grassy understory, as well as grass plains throughout the South of Australia (Higgins 2002). Southern whiteface favours woodlands dominated by mulga and drought-resistant shrub species, namely saltbush (Morcombe 2003).	Potential	Closest record approximately 64 km NE of study area (DESI, 2023). Field surveys observed suitable habitat for this species, namely grass plains with drought-resistant species. However, no individuals were observed on site.
Calidris ferruginea	Curlew sandpiper	CE	CE	Coastal species that forages and roosts in intertidal mudflats, sheltered coastal areas including estuaries, bays, inlets, lagoons and non-tidal swamps, lakes, and lagoons close to the coast, ponds in saltworks and sewage farms.	Unlikely	Closest record approximately 239 km NW of study area. Field surveys confirmed no suitable habitat for this species in inhabit.
Erythrotriorchis radiatus	Red goshawk	E	E	Prefers a mix of vegetation types with its habitat including tall open forest, woodland, lightly treed savannah, and the edge of rainforest. In partly cleared parts of eastern Queensland, it is associated with gorge and escarpment country.	Unlikely	Closest record approximately 680 km NE of study area (DES, 2023). Field observations conformed no suitable habitat present within the study area or surrounds.
Falco hypoleucos	Grey falcon	V	V	Occurs in arid and semi-arid areas of Australia at low densities. Nests within the tallest trees along watercourses. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses and has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.	Potential	May occur. Closest record approximately 60 km SE of study area (ALA, 2023). Field surveys identified that there is suitable breeding and foraging habitat within the study area and surrounds however, no direct observations were made.
Grantiella picta	Painted honeyeater	V	V	Species is rare migrant across eastern Australia. Occurs in mistletoes in Eucalypt Forest, box-ironbark-yellow gum woodlands and Casuarina and Acacia dominated woodlands.	Unlikely	Closest record approximately 204 km East of study area (DES, 2023). Field surveys identified that there was no suitable habitat for this species within the study area or surrounds.
Lophochroa leadbeateri leadbeateri	Major Mitchell's cockatoo	E	E	This subspecies occurs in the Murray-Darling, Eyre and Bulloo River basins, from Isisford and Roma in Queensland, through western New South Wales to north-west Victoria and west to eastern South Australia (Higgins, 1999).	Unlikely	May occur. Closest record approximately 89 km West of study area (DES, 2023). Field surveys confirmed that no suitable habitat is present within the study area or surrounds.

Scientific name	Common name	EPBC status	NC status	Habitat description	Likelihood of occurrence	Likelihood of occurrence justification
Neophema chrysostoma	Blue-winged parrot	V	V	Known to occur in sparse open forest or woodland and inland shrubs such as mulga cypress, mallee, saltbushes, and lignum flats.	Potential	Closest record approximately 188 km North of study area (DES, 2023). Field surveys confirmed that suitable habitat is present within the study area and surrounds however, no direct observations were made.
Pedionomus torquatus	Plains wanderer	CE	CE	The plains wanderer is a ground-dwelling bird recorded in the sparse, treeless, lowland native grasslands of Queensland, New South Wales, Victoria, and South Australia that usually occur on hard, red-brown clay soils that do not support dense pasture growth (TSSC, 2016b). The species does not require regular access to water bodies and are deemed to avoid close proximity to trees, stags or big wooden debris (TSSC, 2016b).	Potential	Closest record approximately 143.5 km North of study area. Field surveys confirmed that suitable habitat is present within the study area and surrounds however, no direct observations were made.
Pezoporus occidentalis	Night parrot	E	E	The species inhabits spinifex stony rises and plains, saltbush shrublands, Samphire flats on salt pan margins (ALA, 2023).	Unlikely	Closest record approximately 380 km NW of study area (ALA, 2023). Field observations confirmed that no suitable habitat is present within the study area or surrounds. No spinifex or stony rises were identified during field investigations.
Rostratula australis	Australian painted snipe	E	E	Species is dependent on wetlands including shallow terrestrial freshwater (occasionally brackish) wetlands, temporary and permanent lakes, swamps and claypans. Preferred wetland habitat is characterised by emergent vegetation (including tussocks, grasses, sedges, rushes, reeds, canegrass and/or paperbarks) where nesting will occur. Artificial habitats that are occasionally used include reservoirs, farm dams, sewage ponds, inundated grasslands, and leaking irrigation channels.	Unlikely	Closest record approximately 222 km East of study area (DESI, 2023). Field surveys confirmed that no suitable habitat is present within the study area or surrounds. No water sources were identified near the study area.
Plants						
Frankenia plicata	Sea heath	E	E	The species is a small erect or prostrate shrub growing in a range of habitats, including on small hillside channels, which take the first run-off after rain (Leigh et al., 1984). In the Simpson Desert, the species has been found predominantly from swales of loamy sands to clay (Neagle, 2002). This species is found in a wide range of vegetation communities that have good drainage (TSSC, 2008).	Unlikely	Closest record approximately 324 km SW of study area (AVH 2023). Field surveys confirmed that suitable habitat was present within pockets of the study area however, no direct observations were made.

Scientific name	Common name	EPBC status	NC status	Habitat description	Likelihood of occurrence	Likelihood of occurrence justification
Sclerolaena walkeri	-	V	LC	Found in central Queensland occurring on saline river flats. Associated species include *Neobassia proceriflora*, *Chenopodium auricomum* and *Eucalyptus ochrophloia*.	Unlikely.	Closest record approximately 168 km West of study area (DESI, 2023). Field surveys confirmed that suitable habitat was present and associated species were identified. However, no direct observations of this species were made.
Swainsona murrayana	Slender Darling-pea	V	V	Slender Darling-pea is found in grassland, herbland, and open Black-box woodland, often in depressions. This species grows in heavy grey or brown clay, loam, or red cracking clays. It is often associated with low chenopod shrubs (*Maireana spp*.), wallaby-grass (*Austrodanthonia spp*), and spear grass (*Austrostipa spp.*)	Unlikely	Closest record approximately 325 km SW of study area (DESI, 2023). Field surveys confirmed that suitable habitat was not present and associated species were not observed.
Xerothamnella parvifolia	-	V	LC	Occurs in Flinders Ranges of South Australia, central-west, and south-west Queensland and far-north-west New South Wales. Larger population in Queensland than other states. Occurs in a variety of soil types and in Queensland grows in Gidgee low open woodland with *Senna artemisioides subsp. Oligophylla* and *Senna artemisioides subsp. coriacea.* Prefers reddish clay soil with stony or gravelly surface.	Unlikely	Closest record approximately 94 km East of study area (DESI, 2023). Field surveys confirmed that no suitable habitat was present within the study area or surrounds. No associated species were identified.

Appendix C Site photos

Site ID	Orientation	Photo	
W1	Start		
W1	North		
W1	East		

W1	South		
W1	West		
W1	End		

W2	Start			
W2	North			
W2	East			
W2	South			

				
W2	West			
W2	End			

W3	Start			
W3	North			
W3	East			

W3	South			
W3	West			
W3	End			

W4	Start			
W4	North			
W4	East			

W4	South		
W4	West		
W4	End		
W5	Start		

				
W5	North			
W5	East			

W5	South		
W5	West		
W5	End		

W6	Start		
W6	North		
W6	East		
W6	South		

				
W6	West			
W6	End			

W7	Start		
W7	North		
W7	East		
W7	South		

				
W7	West			
W7	End			

W8	Start			
W8	North			
W8	East			

W8	South			
W8	West			
W8	End			

Appendix D BioCondition scores

Assessment unit	RE	Condition	Benchmark used	Study area (ha)	Number of sites	Average BioCondition score	BioCondition Class
AU1	5.3.13a	Remnant	5.3.13a	2.48	2	0.85	1
AU2	5.3.18a	Remnant	5.3.18a	22.04	3	0.83	1
AU3	5.3.18b	Remnant	5.3.19	3.02	3	0.77	2

AU1 – 5.3.13a					
Site ID		**W3**		**W7**	
Value Type	**Benchmark**	**Field value**	**Score**	**Field value**	**Score**
Field based attributes					
Recruitment (%)	100	100	5	100	5
Native tree sp. richness (count)	N/A	2	N/A	2	N/A
Native shrub sp. richness (count)	3-4	4	5	5	5
Native grass sp. richness (count)	3-7	2	2.5	2	2.5
Native forb sp. richness (count)	9-22	8	2.5	10	2.5
Tree Canopy Height (m)	N/A	8	N/A	7	N/A
Tree Canopy Cover (m)	N/A	22	N/A	2	N/A
Shrub canopy cover (m)	1-50	13	5	21	5
Native perennial grass cover (%)	0-5	21.2	5	0.2	5
Organic litter cover (%)	N/A	15.6	N/A	9.2	N/A
Large trees (count)	N/A	0	N/A	0	N/A
Coarse woody debris (m)	N/A	60	N/A	30	N/A
Weed cover (%)	0	1	10	1	10
Total field-based attributes			35		35
Landscape scale attributes					
Distance from water (km)			20		20
Total BioCondition score			55		55
Weighted Ecosystem Score			0.85		0.85
Final Classification			1		1

AU2 – 5.3.18a							
Site ID		**W1**		**W5**		**W8**	
Value Type	**Benchmark**	**Field value**	**Score**	**Field value**	**Score**	**Field value**	**Score**
Field based attributes							
Recruitment (%)	100	0	0	0	0	0	0
Native tree sp. richness (count)	1-2	0	0	0	0	0	0
Native shrub sp. richness (count)	2-4	3	5	3	5	2	5
Native grass sp. richness (count)	2-16	2	5	1	2.5	4	5
Native forb sp. richness (count)	7-31	6	2.5	3	2.5	9	5
Tree Canopy Height (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tree Canopy Cover (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shrub canopy cover (m)	0-64	1.4	5	8.2	5	3.2	5
Native perennial grass cover (%)	0-5	0.1	5	0	0	8.6	5
Organic litter cover (%)	14	37.5	3	29	3	32.4	3
Large trees (count)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Coarse woody debris (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Weed cover (%)	0	1	10	1	10	0	10
Total field-based attributes			**36**		**28**		**38**
Landscape scale attributes							
Distance from water (km)			20		20		20
Total BioCondition Score			**55.5**		**48**		**58**
Weighted Ecosystem Score			**0.85**		**0.74**		**0.89**
Final Classification			**1**		**2**		**1**

AU3 – 5.3.18b							
Site ID		**W2**		**W4**		**W6**	
Value Type	**Benchmark**	**Field value**	**Score**	**Field value**	**Score**	**Field value**	**Score**
Field based attributes							
Recruitment (%)	N/A	0	N/A	0	N/A	0	N/A
Native tree sp. richness (count)	N/A	0	N/A	0	N/A	0	N/A
Native shrub sp. richness (count)	N/A	2	N/A	2	N/A	1	N/A
Native grass sp. richness (count)	7	2	5	0	0	0	0
Native forb sp. richness (count)	13	6	5	5	2.5	2	2.5
Tree Canopy Height (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tree Canopy Cover (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shrub canopy cover (m)	N/A	2.7	N/A	0.4	N/A	0	N/A
Native perennial grass cover (%)	3	0	0	0	0	0	0
Organic litter cover (%)	5	34	3	46.6	3	2.8	5
Large trees (count)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Coarse woody debris (m)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Weed cover (%)	0	1	10	1	10	1	10
Total Field based attributes			23		15.5		**17.5**
Landscape scale attributes							
Distance from water (km)			20		20		20
Total BioCondition Score			**43**		**35.5**		**37.5**
Weighted Ecosystem Score			**0.86**		**0.71**		**0.75**
Final Classification			**1**		**2**		**2**

Appendix E Species list

Species	W1	W2	W3	W4	W5	W6	W7	W8
Acacia sp. (sapling)						✓		
Acacia stenophylla			✓		✓		✓	
Acacia victoriae							✓	
Alternanthera nodiflora		✓	✓	✓			✓	
Arabidella nasturtium.	✓	✓	✓				✓	✓
Atriplex sp.			✓				✓	
Atriplex velutinella	✓	✓		✓	✓			✓
Calotis hispidula								✓
Chenopodium auricomum	✓	✓	✓	✓	✓	✓	✓	✓
Dactyloctenium radulans		✓						
Duma florulenta	✓		✓		✓		✓	✓
Echinochloa turneriana			✓				✓	✓
Eleocharis pallens			✓				✓	✓
Eragrostis setifolia	✓	✓	✓		✓		✓	✓
Eragrostis sp.			✓				✓	✓
Eremophila bignoniiflora			✓					
Ethuliopsis cunninghamii	✓				✓		✓	✓
Euphorbia drummondii	✓	✓	✓				✓	

Species	W1	W2	W3	W4	W5	W6	W7	W8
Forb 2 (Pink)							✓	
Forb 1	✓	✓						
Grevillea stenobotrya							✓	
Ipomoea diamantinensis			✓				✓	
Maireana aphylla							✓	
Marsilea drummondii		✓	✓	✓		✓	✓	
Portulaca oleracea	✓	✓		✓	✓	✓		✓
Sclerolaena 1 (Red)		✓	✓	✓	✓	✓	✓	✓
Sclerolaena 2 (White)								✓
Senecio depressicola	✓	✓	✓	✓			✓	✓

Appendix F Significant Impact Assessments

A significant impact assessment has been prepared for all MNES and MSES identified within the study area as potentially occurring. These MNES occurring in the Project area are limited to threatened species known or potentially occurring.

This assessment has been undertaken in accordance with the EPBC Act Significant Impact Guidelines 1.1 (DoE, 2013) for MNES and the Significant Residual Impact Guidelines (EHP 2014) for MSES.

In the absence of species-specific policy guidelines or recovery plans, the definitions from the Significant Impact Guidelines (DoE, 2013) for 'population of a species', 'important population', and 'habitat critical for the survival of the species' were applied to vulnerable threatened species impact assessments. These are presented below.

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered, or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations; or
- a population, or collection of local populations, that occurs within a particular bioregion.

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

Habitat critical to the survival of a species refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long-term evolutionary development; or
- for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

BULLOO GREY GRASSWREN (*AMYTORNIS BARBATUS BARBATUS*) – POTENTIAL IMPACTS AND SIGNIFICANT ASSESSMENT

Criteria	Response to criteria
• Lead to a long-term decrease in the size of an important population of a species. • Lead to a long-term decrease in the size of a local population.	The Grey grasswren occurs in arid and semi-arid Australia and occurs at low densities within this inland environment. It is an elusive and thought to be relatively sedentary species. Grey grasswren habitat within the study area is considered to comprise mostly potential foraging habitat, with potential breeding habitat limited to habitat with dense shrubs such as lignum, swamp canegrass and old man saltbush. Four individuals were observed within the study area. The project will directly impact up to 5.23 ha of foraging habitat. Direct impacts of the proposed development are unlikely to inhibit breeding or movement of the Grey grasswren and are unlikely to lead to a long-term decrease in the size of an important population or size of a local population.
• Reduce the area of occupancy of an important population. • Reduce the extent of occurrence of the species.	Direct impacts up to 5.23 ha of potential habitat will not inhibit breeding or movement of the species, and therefore is unlikely to reduce the AOO or EOO of the species.
Fragment an existing important population into two or more populations.	Direct impacts up to 5.23 ha will be predominantly linear in nature (e.g. associated with the pipeline right of way). The pipeline right of way will be a maximum of 19m and is unlikely to fragment an existing population into two or more populations. The species was recorded on both sides of the existing historical disturbance within the impact area, suggesting than narrow linear disturbance similar to what is being proposed does not limit local habitat connectivity for the species.
Adversely affect habitat critical to the survival of the species.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat. Considering the wide ranging and mobile nature of the species, and the very small area and temporary nature of the impacts, the proposed development is not considered likely to adversely affect habitat critical to the survival of the species.
• Disrupt the breeding cycle of an important population. • Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat. Considering the wide ranging and mobile nature of the species, and the very small area and temporary nature of the impacts, the proposed development is not considered likely to disrupt the breeding cycle of an important population or disrupt an ecological significant location for the species. To minimise potential impacts to individuals, mitigations outlined in **Section 4** are recommended.
• Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline. • Result in genetically distinct populations forming as a result of habitat isolation.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat. Appropriate management practises will be implemented during the proposed development to reduce the risk of habitat degradation of surrounding areas. The proposed development is not likely to impact habitat to the extent that the species is likely to decline or be isolated given the very small area and temporary nature of the impacts and the species' mobile nature.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Limited invasive weed species are known from the surrounding area. Appropriate vehicle hygiene procedures will be implemented, to minimise the risk of introduction or spread of weed species. Pest species that are harmful to the species (e.g. feral cats and foxes) are already known from the region and the proposed development is unlikely to increase the risk of harm from pest species.

Criteria	Response to criteria
Introduce disease that may cause the species to decline.	It is unlikely that the proposed development will facilitate the introduction or spread of diseases specific to the species, or diseases that can significantly degrade habitat such as root rot (*Phytophthora cinnamomi*).
Interfere substantially with the recovery of the species.	There is no Recovery Plan for this species. Considering the wide ranging and mobile nature of the species, and the very small area and temporary nature of the impacts, the proposed development is not considered to substantially interfere with the recovery of the species.

SOUTHERN WHITEFACE (*APHELOCEPHALA LEUCOPSIS*) – POTENTIAL IMPACTS AND SIGNIFICANT ASSESSMENT

Criteria	Response to criteria
• Lead to a long-term decrease in the size of an important population of a species. • Lead to a long-term decrease in the size of a local population.	The Southern whiteface occurs in arid open woodlands with shrubby or grassy understorey and are considered to be sedentary. Southern whiteface habitat within the study area is considered to represent mostly potential foraging habitat, with potential breeding habitat. Given the lack of species observations within the study area, and the majority of the study area comprising only foraging habitat, it is unlikely an important population of Southern whiteface occurs in the study area. The project will directly impact up to 5.23 ha of foraging habitat. Direct impacts of the proposed development are unlikely to inhibit breeding or movement of the Southern whiteface and is unlikely to lead to a long-term decrease in the size of an important population or size of a local population.
• Reduce the area of occupancy of an important population. • Reduce the extent of occurrence of the species.	Direct impacts up to 5.23 ha of potential habitat will not inhibit breeding or movement of the species, and therefore is unlikely to reduce the AOO or EOO of the species.
Fragment an existing important population into two or more populations.	Direct impacts up to 3.11 ha of potential foraging habitat is likely to be predominantly linear in nature (e.g. access tracks, pipeline right of ways) and minor areas of clearing for well pads. An important population of the species is unlikely to occur (as per the above). The proposed development is unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species.	No habitat critical to the survival of the species is defined for Southern whiteface. Whilst potential habitat for the species may be present in the form of potential foraging and breeding habitat, the habitat present in the study area is typical of that in the surrounding landscape and is unlikely to be necessary for the long-term maintenance of the species, or to maintain genetic diversity or for the reintroduction of populations. As such, habitat within the study area is unlikely to be habitat critical to the survival of the Southern whiteface. The proposed development will directly impact up to 5.23 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. In consideration of these facts, the proposed development is not considered to adversely affect habitat critical to the survival of the species.
• Disrupt the breeding cycle of an important population. • Cause disruption to ecologically significant locations (breeding,	The proposed development will directly impact up to 5.23 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. An important population or ecologically significant locations for Southern whiteface is unlikely to occur. Therefore, the proposed development is unlikely to disrupt to the

Criteria	Response to criteria
feeding, nesting, migration, or resting sites) of a species.	breeding cycle of an important population or disrupt an ecological significant location. To minimise potential impacts to individuals, mitigations outlined in Section 4 are recommended.
• Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline. • Result in genetically distinct populations forming as a result of habitat isolation.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat only. Whilst the area of potential habitat will decrease within the study area, the extent is negligible considering the wide ranging and mobile nature of the species. Appropriate management practises will be implemented during the proposed development to reduce the risk of habitat degradation of surrounding areas. The proposed development is unlikely to impact habitat to the extent that the species is likely to decline or be isolated given the nature of the proposed impact and the species' mobile nature.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Limited invasive weed species are known from the surrounding area. Appropriate vehicle hygiene procedures will be implemented, to minimise the risk of introduction or spread of weed species. Pest species that are harmful to the species (e.g. feral cats and foxes) are already known from the region and the proposed development is unlikely to increase the risk of harm from pest species.
Introduce disease that may cause the species to decline.	It is unlikely that the proposed development will facilitate the introduction or spread of diseases specific to the species, or diseases that can significantly degrade habitat such as root rot (*Phytophthora cinnamomi*).
Interfere substantially with the recovery of the species.	There is no Recovery Plan for this species. Considering the wide ranging and mobile nature of the species and that the habitat impacted is negligible in regard to the available habitat in the surrounding landscape, the proposed development is not considered to substantially interfere with the recovery of the species.

PLAINS WANDERER (*PEDIONOMUS TORQUATUS*) – POTENTIAL IMPACTS AND SIGNIFICANT ASSESSMENT

Criteria	Response to criteria
Lead to a long-term decrease in the size of an important population of a species. Lead to a long-term decrease in the size of a local population.	The plains wanderer occurs in sparse, treeless, lowland native grasslands and do not need regular access to water bodies. Plains wanderer habitat within the study area is considered to represent mostly potential foraging habitat, with potential breeding habitat limited to grasslands. Given the lack of species observations within the study area, and the majority of the study area comprising only foraging habitat, it is unlikely an important population of plains wanderer occurs in the study area. The project will directly impact up to 4.99 ha of foraging habitat. Direct impacts of the proposed development are unlikely to inhibit breeding or movement of the plains wanderer and is unlikely to lead to a long-term decrease in the size of an important population or size of a local population.
• Reduce the area of occupancy of an important population. • Reduce the extent of occurrence of the species.	Direct impacts up to 4.99 ha of potential habitat will not inhibit breeding or movement of the species, and therefore is unlikely to reduce the AOO or EOO of the species.
Fragment an existing important population into two or more populations.	Direct impacts up to 4.99 ha of potential foraging habitat is likely to be predominantly linear in nature (e.g. access tracks, pipeline right of ways) and minor areas of clearing for well pads.

Criteria	Response to criteria
	An important population of the species is unlikely to occur (as per the above). This species is restricted to sparse, treeless, lowland native grasslands; therefore, the proposed development is unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species.	No habitat critical to the survival of the species is defined for plains wanderer. Whilst potential habitat for the species may be present in the form of potential foraging and breeding habitat, the habitat present in the study area is typical of that in the surrounding landscape and is unlikely to be necessary for the long-term maintenance of the species, or to maintain genetic diversity or for the reintroduction of populations. As such, habitat within the study area is unlikely to be habitat critical to the survival of the lains wanderer. The proposed development will directly impact up to 4.99 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. In consideration of these facts, the proposed development is not considered to adversely affect habitat critical to the survival of the species.
• Disrupt the breeding cycle of an important population. • Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species.	The proposed development will directly impact up to 4.99 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. An important population or ecologically significant locations for plains wanderer is unlikely to occur. Therefore, the proposed development is unlikely to disrupt to the breeding cycle of an important population or disrupt an ecological significant location. To minimise potential impacts to individuals, mitigations outlined in Section 4 are recommended.
• Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline. • Result in genetically distinct populations forming as a result of habitat isolation.	The proposed development will directly impact up to 4.99 ha of potential foraging habitat only. Whilst the area of potential habitat will decrease within the study area, the extent is negligible considering the wide ranging and mobile nature of the species. Appropriate management practises will be implemented during the proposed development to reduce the risk of habitat degradation of surrounding areas. The proposed development is unlikely to impact habitat to the extent that the species is likely to decline or be isolated given the nature of the proposed impact and the species' mobile nature.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Limited invasive weed species are known from the surrounding area. Appropriate vehicle hygiene procedures will be implemented, to minimise the risk of introduction or spread of weed species. Pest species that are harmful to the species (e.g. feral cats and foxes) are already known from the region and the proposed development is unlikely to increase the risk of harm from pest species.
Introduce disease that may cause the species to decline	It is unlikely that the proposed development will facilitate the introduction or spread of diseases specific to the species, or diseases that can significantly degrade habitat such as root rot (*Phytophthora cinnamomi*).
Interfere substantially with the recovery of the species.	There is no Recovery Plan for this species. Considering the wide ranging and mobile nature of the species and that the habitat impacted is negligible in regard to the available habitat in the surrounding landscape, the proposed development is not considered to substantially interfere with the recovery of the species.

GREY FALCON (*FALCO HYPOLEUCOS*) – POTENTIAL IMPACTS AND SIGNIFICANT ASSESSMENT

Criteria	Response to criteria
• Lead to a long-term decrease in the size of an important population of a species. • Lead to a long-term decrease in the size of a local population.	The Grey falcon occurs in arid and semi-arid Australia and occurs at low densities within this inland environment. It is a wide ranging, mobile species. Grey falcon habitat within the study area is considered to represent mostly potential foraging habitat, with potential breeding habitat limited to taller trees along watercourses (such as Acacia woodlands habitat type). Given the lack of species observations within the study area, and the majority of the study area comprising only foraging habitat, it is unlikely an important population of Grey falcon occurs in the study area. The project will directly impact up to 5.82 ha of foraging habitat. Direct impacts of the proposed development are unlikely to inhibit breeding or movement of the Grey falcon and is unlikely to lead to a long-term decrease in the size of an important population or size of a local population.
Reduce the area of occupancy of an important population OR Reduce the extent of occurrence of the species	Direct impacts up to 5.82 ha of potential habitat will not inhibit breeding or movement of the species, and therefore is unlikely to reduce the AOO or EOO of the species.
Fragment an existing important population into two or more populations.	Direct impacts up to 5.82 ha of potential foraging habitat is likely to be predominantly linear in nature (e.g. access tracks, pipeline right of ways) and minor areas of clearing for well pads. An important population of the species is unlikely to occur (as per the above). This species is highly mobile and wide ranging; therefore, the proposed development is unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species.	No habitat critical to the survival of the species is defined for Grey falcon. Whilst potential habitat for the species may be present in the form of potential foraging and breeding habitat, the habitat present in the study area is typical of that in the surrounding landscape and is unlikely to be necessary for the long-term maintenance of the species, or to maintain genetic diversity or for the reintroduction of populations. As such, habitat within the study area is unlikely to be habitat critical to the survival of the Grey falcon. The proposed development will directly impact up to 5.82 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. In consideration of these facts, the proposed development is not considered to adversely affect habitat critical to the survival of the species.
• Disrupt the breeding cycle of an important population. • Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species.	The proposed development will directly impact up to 5.82 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. An important population or ecologically significant locations for Grey falcon is unlikely to occur. Therefore, the proposed development is unlikely to disrupt to the breeding cycle of an important population or disrupt an ecological significant location. To minimise potential impacts to individuals, mitigations outlined in Section 4 are recommended.
• Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The proposed development will directly impact up to 5.82 ha of potential foraging habitat only. Whilst the area of potential habitat will decrease within the study area, the extent is negligible considering the wide ranging and mobile nature of the species. Appropriate management practises will be implemented during the proposed development to reduce the risk of habitat degradation of surrounding areas. The proposed development is unlikely to impact

Criteria	Response to criteria
• Result in genetically distinct populations forming as a result of habitat isolation.	habitat to the extent that the species is likely to decline or be isolated given the nature of the proposed impact and the species' mobile nature.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Limited invasive weed species are known from the surrounding area. Appropriate vehicle hygiene procedures will be implemented, to minimise the risk of introduction or spread of weed species. Pest species that are harmful to the species (e.g. feral cats and foxes) are already known from the region and the proposed development is unlikely to increase the risk of harm from pest species.
Introduce disease that may cause the species to decline.	It is unlikely that the proposed development will facilitate the introduction or spread of diseases specific to the species, or diseases that can significantly degrade habitat such as root rot (*Phytophthora cinnamomi*).
Interfere substantially with the recovery of the species.	There is no Recovery Plan for this species. Considering the wide ranging and mobile nature of the species and that the habitat impacted is negligible in regard to the available habitat in the surrounding landscape, the proposed development is not considered to substantially interfere with the recovery of the species.

BLUE-WINGED PARROT (*NEOPHEMA CHRYSOSTOMA*) – POTENTIAL IMPACTS AND SIGNIFICANT ASSESSMENT

Criteria	Response to criteria
• Lead to a long-term decrease in the size of an important population of a species. • Lead to a long-term decrease in the size of a local population.	The Blue-winged parrot occurs in sparse open forest or woodland and inland shrubs such as mulga. Blue-winged parrot habitat within the study area is considered to represent mostly potential foraging habitat, with potential breeding habitat limited to shrubland. Given the lack of species observations within the study area, and the majority of the study area comprising only foraging habitat, it is unlikely an important population of Blue-winged parrot occurs in the study area. The project will directly impact up to 5.23 ha of foraging habitat. Direct impacts of the proposed development are unlikely to inhibit breeding or movement of the Blue-winged parrot and is unlikely to lead to a long-term decrease in the size of an important population or size of a local population.
• Reduce the area of occupancy of an important population. • Reduce the extent of occurrence of the species.	Direct impacts up to 5.23 ha of potential habitat will not inhibit breeding or movement of the species, and therefore is unlikely to reduce the AOO or EOO of the species.
Fragment an existing important population into two or more populations.	Direct impacts up to 5.23 ha of potential foraging habitat is likely to be predominantly linear in nature (e.g. access tracks, pipeline right of ways) and minor areas of clearing for well pads. An important population of the species is unlikely to occur (as per the above). This species is restricted to open forests and shrubland; therefore, the proposed development is unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of the species.	No habitat critical to the survival of the species is defined for Blue-winged parrot. Whilst potential habitat for the species may be present in the form of potential foraging and breeding habitat, the habitat present in the study area is typical of that in the surrounding landscape and is

Criteria	Response to criteria
	unlikely to be necessary for the long-term maintenance of the species, or to maintain genetic diversity or for the reintroduction of populations. As such, habitat within the study area is unlikely to be habitat critical to the survival of the Blue-winged parrot. The proposed development will directly impact up to 5.23 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. In consideration of these facts, the proposed development is not considered to adversely affect habitat critical to the survival of the species.
• Disrupt the breeding cycle of an important population. • Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat, which is a small amount of habitat available within the study area and surrounding region. An important population or ecologically significant locations for Blue-winged parrot is unlikely to occur. Therefore, the proposed development is unlikely to disrupt to the breeding cycle of an important population or disrupt an ecological significant location. To minimise potential impacts to individuals, mitigations outlined in Section 4 are recommended.
• Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline. • Result in genetically distinct populations forming as a result of habitat isolation.	The proposed development will directly impact up to 5.23 ha of potential foraging habitat only. Whilst the area of potential habitat will decrease within the study area, the extent is negligible considering the present habitat. Appropriate management practises will be implemented during the proposed development to reduce the risk of habitat degradation of surrounding areas. The proposed development is unlikely to impact habitat to the extent that the species is likely to decline or be isolated given the nature of the proposed impact and the species' mobile nature.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Limited invasive weed species are known from the surrounding area. Appropriate vehicle hygiene procedures will be implemented, to minimise the risk of introduction or spread of weed species. Pest species that are harmful to the species (e.g. feral cats and foxes) are already known from the region and the proposed development is unlikely to increase the risk of harm from pest species.
Introduce disease that may cause the species to decline.	It is unlikely that the proposed development will facilitate the introduction or spread of diseases specific to the species, or diseases that can significantly degrade habitat such as root rot (*Phytophthora cinnamomi*).
Interfere substantially with the recovery of the species.	There is no Recovery Plan for this species. Considering the wide ranging and mobile nature of the species and that the habitat impacted is negligible in regard to the available habitat in the surrounding landscape, the proposed development is not considered to substantially interfere with the recovery of the species.

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1300 646 131
www.ecoaus.com.au