

APPENDIX C ECOLOGICAL ASSESSMENT REPORT



Ecological Assessment Report

**Comet Ridge Limited
Mahalo North Coal Seam Gas Project
Comet Ridge
BAA220014.01
1 March 2024**

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EXECUTIVE SUMMARY

Comet Ridge Mahalo North Pty Ltd (Comet Ridge) is proposing to develop a greenfield Coal Seam Gas (CSG) project contained within ATP2048 (the Project). The Project area is situated in Central Queensland approximately 45 kilometres (km) north of Rolleston and lies within the Central Highlands Regional Council area. The Project will require the development of 68 coal seam gas wells, gas gathering pipelines, a gas compression facility (GCF), and new access tracks. At this stage of the Project the location of the export pipeline alignment is still under investigation. Therefore, the export pipeline is excluded from this assessment.

The Project is located within the Brigalow Belt North Bioregion (BBNB). Within the BBNB the Project area lies within the Isaac-Comet Downs subregions. The overall Study area (which represents 45 subblocks within ATP2048) covers 14,078 hectares (ha), of which the majority (over 85 percent) (%) has been cleared for cattle grazing and cropping. Remnant vegetation is located largely in the northern section of the Study area on Togara property. Topography is relatively flat undulating downs, descending from the higher alluvial areas on the eastern boundary to the alluvial flats associated with the Comet River. The Project is located within the Comet River catchment which is part of the Fitzroy River Basin.

Desktop review and field surveys (carried out in 2022 and 2023) were carried out to characterise the terrestrial ecological values associated with the Project and immediate surrounds. The desktop review identified the potential presence of eight flora species and 26 fauna species listed as threatened under the *Nature Conservation Act 1992* (NC Act) and/or *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) as potentially occurring within the Study area and surrounds. A further 12 species listed as Migratory (under the EPBC Act) and Special Least Concern (SLC) (under the NC Act) were also predicted to occur. Other environmental values predicted to be present and listed as MSES include endangered regulated vegetation (under the *Vegetation Management Act 1999* (VM Act)) and protected wildlife habitat.

The flora survey identified seven Regional Ecosystems (REs) within the Study area based on site surveys and analysis of aerial imagery. There are five REs comprising Brigalow communities listed as Endangered under the Queensland *Environmental Protection Act 1994* (EP Act) present. The majority of vegetation is listed as No Concern under the EP Act. There are substantial differences with the current State Government RE mapping which overstates the potential extent of Brigalow communities present within the Study area. One EPBC Act listed TEC is considered present as scattered patches throughout the Study area. No threatened flora species were observed during the Project surveys. Nevertheless, one species is known to be present based on previous recent surveys for a different project encompassing the Study area (*Solanum elaeagnifolium* – endangered – NC Act). Annual Wiregrass (*Aristida annua*) is considered likely to be present (Vulnerable - EPBC Act and NC Act) and two other threatened flora species have some potential to occur.

State mapping for threatened fauna species indicates there is habitat for Ornamental Snake (*Denisonia maculata*) (Vulnerable – EPBC Act and NC Act) within the Study area. No threatened or migratory species were recorded during site surveys for the Project. Short-beaked echidna (*Tachyglossus aculeatus*) is listed as SLC under the NC Act and was recorded during the Project surveys. Ornamental Snake has been recorded to the east and south-east of the Study area and is considered likely to occur based on the presence of suitable gilgai habitat, although targeted trapping during ideal conditions did not record the species. Koala (*Phascolarctos cinereus*) is also considered likely to occur based on older database records located within the Study area and the presence of suitable habitat. The Project area provides possible habitat for a further six threatened species and six migratory bird species.

In general, impacts resulting from Project activities will be minor and likely restricted to the construction phase. The location of Project infrastructure has been substantially revised and located away from sensitive ecological values as much as is feasible. The current Project layout of gas field infrastructure requires disturbance (vegetation clearing) of a maximum of 178.27 ha the majority of which is located in lands cleared for cattle grazing. The Project disturbance footprint has been refined to minimise impact on ecological values and is predicted to impact only 1.17 ha of remnant Poplar Box woodland through vegetation clearing, all of which is listed as No concern under the EP Act. The Project will also impact 0.89 ha of cleared habitat comprising gilgais which may provide potential habitat for threatened species (Ornamental Snake in particular). The majority of the clearing impact will be restricted to narrow linear areas associated with the

gathering flow line construction disturbance and clearing for well pads. Any potential indirect impacts to adjacent fauna/flora habitat from the Project are expected to be minimised through a range of mitigation measures applied under the project Construction Environmental Management Plan (CEMP) and Operational environmental Management Plan (OEMP).

The Project's impacts to Environmental Values were subject to a risk assessment analysis and assessment for significant impacts under State and Commonwealth guidelines. The Project was assessed as avoiding the potential to cause significant residual impacts (SRI) to any Matters of National Environmental Significance (MNES) or Matters of State Environmental Significance (MSES) identified as potentially occurring in the Study area.

1 INTRODUCTION

This Ecological Assessment Report (EAR) has been prepared on behalf of Comet Ridge Mahalo North Pty Ltd (Comet Ridge) to support the legislated environmental approvals process for a greenfield coal seam gas (CSG) project (the Project) contained within Authority to Prospect 2048 (ATP2048). The CSG area is approximately 141 square kilometres (km²) in size and will comprise a maximum of 68 CSG wells (34 CSG production wells and 34 lateral wells).

1.1 Project Location

The Project gas field area is confined to ATP2048 (14,078 hectares) (ha), which represents 45 sub-blocks which are denoted as the Study area for the purposes of this report. At this stage of the Project the location of the export pipeline alignment is still under investigation. Therefore, the export pipeline is excluded from this assessment. The Project area is situated in Central Queensland approximately 45 kilometres (km) north of Rolleston and lies within the Central Highlands Regional Council area. The far eastern portion of the Study area is intersected by Comet-Rolleston Road, which runs in a north-south direction (refer **Figure 1**).

1.2 Scope and Purpose of Assessment

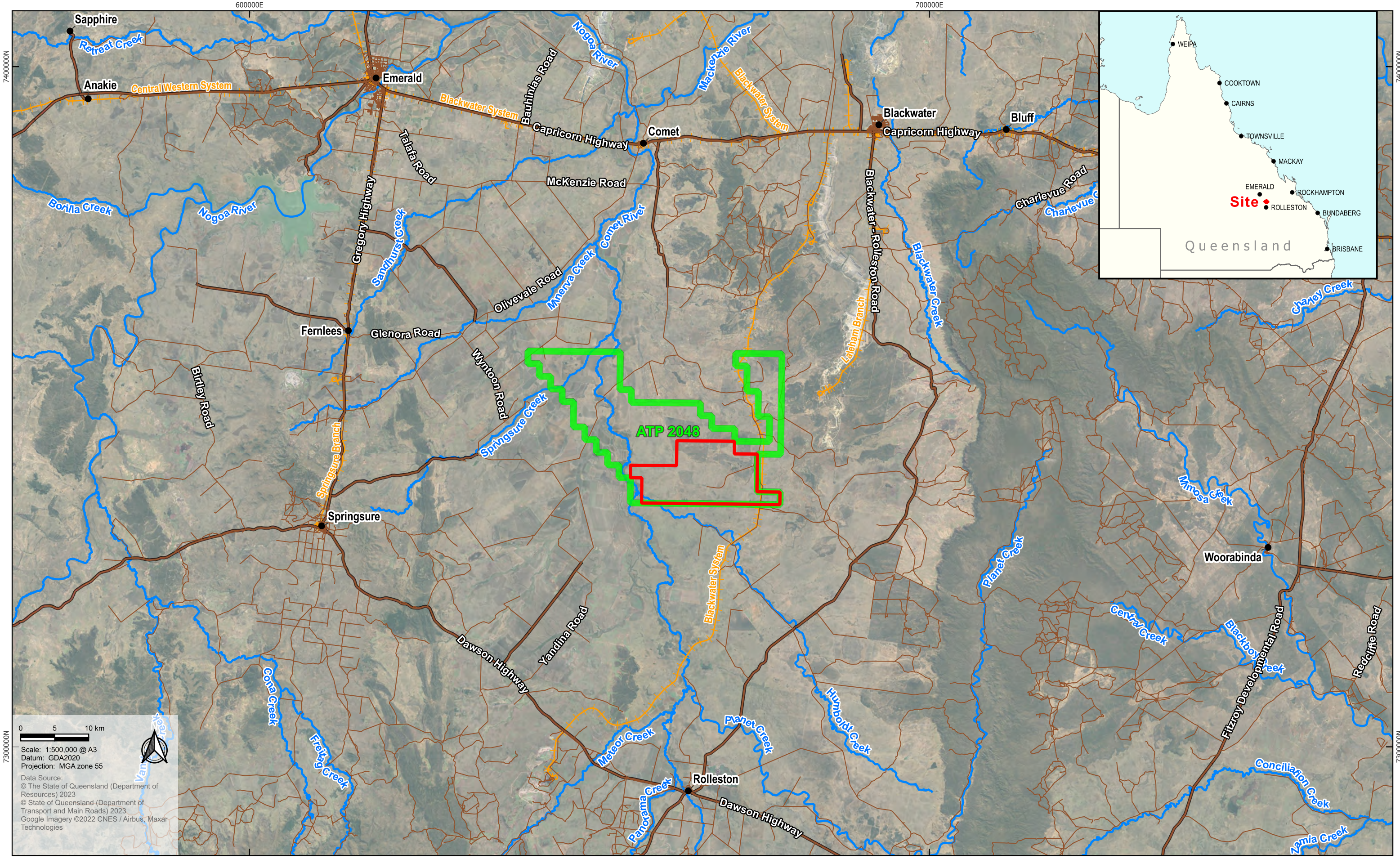
The purpose of the ecological assessment is to document the baseline terrestrial ecological values of the Project area and provide avoidance, mitigation and management measures to adequately address impacts associated with the Project.

The description of baseline ecological values has been documented to support an Environmental Authority (EA) Application under Section 125 of the *Environmental Protection Act 1994* (EP Act) and a Project referral to the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Epic was engaged by Comet Ridge to undertake terrestrial ecological surveys for the Project. The scope of this report includes a description of the terrestrial fauna and flora species and habitats within the Study area. The assessment includes an analysis under relevant State and Commonwealth guidelines of the potential for significant residual impacts (SRI) to the following:

- Matters of National Environmental Significance (MNES) as listed under the EPBC Act such as threatened species (including habitat) and vegetation communities
- Matters of State Environmental Significance (MSES) as identified as Prescribed Environmental Matters (PEMs) under Schedule 2 of the Environmental Offsets Regulation 2014 (Offsets Regulation) including threatened species and identified species habitat areas, listed vegetation communities, waterways and wetlands
- Biodiversity values as defined by the Department of Environment and Science (DES) Streamlined Model Conditions for Petroleum Activities (DES 2016), which includes Environmentally Sensitive Areas (ESA), prescribed environmental matters and wetlands

The potential requirements for environmental offsets will be identified where SRIs are identified as likely occurring to identified environmental matters as a result of the Project's activities.



Legend

Petroleum Lease Boundary	Railways
Exploration permits for petroleum	Roads and tracks
State controlled roads	Major watercourses



**Comet Ridge
Mahalo North CSG Project
Ecological Assessment Report**

Figure 1
Project location

2 PROJECT DESCRIPTION AND ACTIVITIES

The Project involves the construction, operation, decommissioning, and rehabilitation of a CSG activity, including the following infrastructure components (refer **Figure 2**):

- 68 gas production wells
- Gas gathering pipelines
- Gas compression facility (GCF)
- New access tracks

2.1 Gas Production Wells

Surface to in-seam (SIS) gas wells will be constructed consisting of a horizontal well section drilled within the coal seam, that intersects the vertical gas well (the gas production well) (i.e. two wells will be required per production well). In some cases, only the horizontal SIS well will be drilled, and that will be the production well. Gas and water will be collected from the 34 gas production wells designed, constructed, and abandoned in accordance with the *Code of Practice for the construction and abandonment of coal seam gas and petroleum wells, and associated bores in Queensland*. The code outlines mandatory requirements and good practice for drilling and completion of gas wells to ensure long-term well integrity and protection of groundwater resources. Gas production wells for the Project do not require hydraulic stimulation.

Well sites will generally be constructed in an area of up to approximately 1 ha for the initial construction of the well. Following construction, well pads will be partially rehabilitated, leaving up to 0.04 ha required for operational purposes and maintenance. Following drilling and completion, a pump will be installed within the gas production wells to reduce the hydrostatic pressure of the coal seam and facilitate gas production. The standard production well site will be fenced and generally include gas and water metering and separation equipment, electrical and control systems, particulate filter separator and manifolds to connect to water and gas pipelines.

2.2 Ancillary Linear Infrastructure

Below-ground pipelines will be constructed to collect gas and water from each production well. A construction disturbance area of 18 metres (m) wide will be required for standard pipeline construction including trench excavation (up to 0.85 m wide), pipeline laying, backfilling the trench, and reinstatement of the disturbed area. Power lines and communication lines (e.g. fibre optic cable) may be co-located with pipelines. The construction disturbance area has been reduced to a width of 6 m where it intersects potential habitat for threatened species in order to minimise potential impacts. Access to the production wells will use existing farm tracks wherever possible, with new access tracks (6 m in width) installed where required.

2.3 Gas Compression Facility

A GCF will be constructed to gather gas produced from the production wells and pressurise the gas for export to domestic markets. Equipment within the GCF will include:

- Gas compression units (two in operation)
- Gas dehydration / separation units
- Associated instrumentation and control systems
- Water infrastructure, refer to **Section 2.4**
- Water tanks
- Safety systems
- Safety flare
- Site office
- Workshop
- Storage of fuel and chemicals¹

¹ The maximum storage volume of fuels and chemicals on site will not exceed the ERA thresholds listed under s8(1), Schedule 2 of the EP Regulation

- Vehicle washdown bay
- Potable water
- Vehicle parking (for up to 5 light vehicles)
- Accommodation camp (5 person capacity)
- Approximately 6 m wide internal access road

Sales gas from the compression facility would be transported through a licensed pipeline network. It is anticipated the GCF (including ancillary facilities) would require an area of 20 ha.

2.4 Water Management

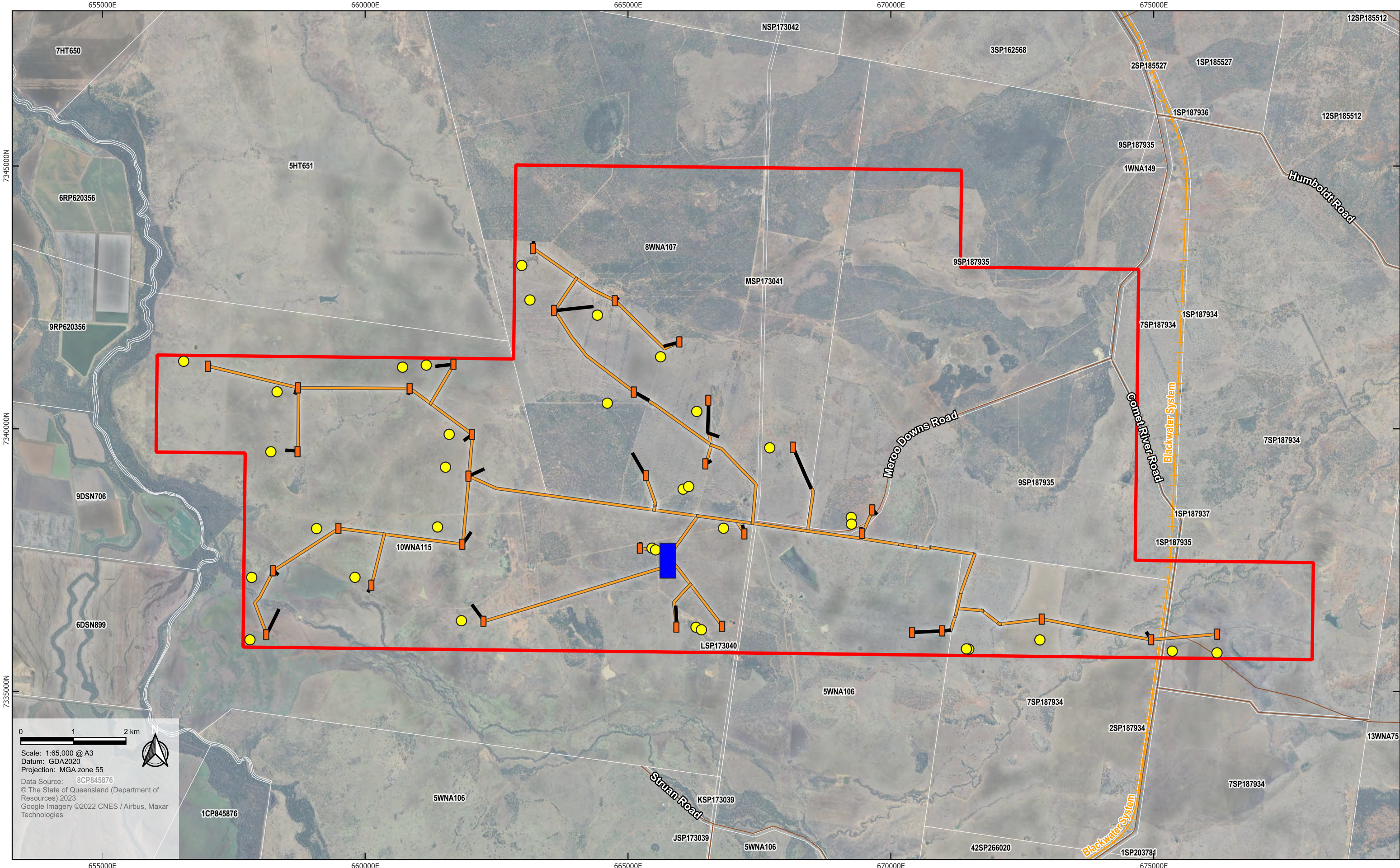
Produced water collected from gas production wells will be transferred to on-site water storages, such as above-ground lined ring tanks. A water treatment facility may be constructed to treat produced water to facilitate the beneficial use of water at a nominal treatment rate of up to approximately 1.0 megalitres (ML)/day.

Brine from any treatment process will be stored in above-ground storages constructed and operated in accordance with the relevant guidelines, from where it may be further concentrated via solar and mechanical evaporation to a concentrated slurry or solid salt. The waste product will be disposed of at a Regulated Waste Facility (RWF).

Water generated from the project may be beneficially used to support irrigation and industrial activities and development and operational activities (including drilling the wells and dust suppression). Water used for these purposes will comply with relevant standards, for example water used for irrigation will comply with Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines for irrigation and the End of Waste Code (EOWC) requirements.

2.5 New Access Tracks

The majority of access tracks required for the Project will utilise existing access tracks. In areas where no access tracks exist, new tracks will be established to allow access to project infrastructure. Based on the current project layout, the Project requires approximately 8 km of new access tracks to be established to access Project infrastructure.



Legend		
	Petroleum Lease Boundary	Infrastructure (indicative only)
	Cadastre (DCDB)	
	Roads and tracks	
	Railways	
		Gas production wells



**Comet Ridge
Mahalo North CSG Project
Ecological Assessment Report**

Figure 2
Project infrastructure layout

3 LEGISLATIVE CONTEXT

3.1 Commonwealth Legislation

3.1.1 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth EPBC Act is the key piece of Commonwealth legislation governing environmental protection in Australia. Administered by the Commonwealth DCCEEW, the EPBC Act defines and protects nine MNES including:

- World heritage properties
- National heritage places
- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines)
- A water resource in relation to coal seam gas development and large coal mining development

Under Part 3 of the EPBC Act, a person must not undertake an action (e.g. a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things) that will have, or is likely to have, a significant impact on a protected matter, without approval from the Minister.

If after all reasonable avoidance and mitigation measure have been taken, there is still a residual impact on a protected matter, an offset may be required where the impact is, or is likely to be, significant.

3.1.2 Environmental Offsets Policy 2012

The EPBC Act *Environmental Offsets Policy October 2012* (EOP) provides upfront guidance on the role of offsets in environmental impact assessments, and how the DCCEEW considers the suitability of a proposed offset. The EOP aims to improve environmental outcomes through the consistent application of best practice offset principles, provide more certainty and transparency, and encourage advanced planning of offsets.

3.2 Queensland State Legislation

3.2.1 Environmental Protection Act 1994

The objective of the EP Act is to protect Queensland's environment and to promote ecologically sustainable development. The EP Act defines a General Environmental Duty under which all persons in Queensland have a responsibility not to carry out an activity that causes or is likely to cause environmental harm, and to take all reasonable and practicable measures to prevent or minimise the harm.

The EP Act also regulates Environmentally Relevant Activities (ERAs). ERAs are activities that require an EA prior to activities commencing. Resource activities (including CSG operations) are defined under the EP Act as a resource ERA for which an EA is required.

In accordance with Section 125 of the EP Act the key areas relevant to ecological matters to be identified and addressed through the ERA application process regarding land include the following:

- Describe the environmental values relevant to, and potentially affected by ERAs associated with the activity
- Describe the potential adverse impacts and assess the risks and magnitude of those impacts on the identified environmental values
- Describe mitigation measures to be implemented to avoid or minimise adverse impacts resulting from the activity

Under the EP Act, EA applications consider (amongst other matters) impacts on the project in regard to biodiversity values. ESAs are biodiversity values identified under the subordinate *Environmental Protection Regulation 2019* (EP Regulation). Two categories of ESA are listed under the regulation (Category A and B) and include the following:

- Category A ESAs include National Parks, Conservation Parks and Forest Reserves as listed under the NC Act
- Category B ESAs include Endangered Regional Ecosystems, Coordinated Conservation Areas, World Heritage management areas, areas of Critical Habitat for threatened species, Wetlands of International Importance, or State Forest Parks or Scientific Areas listed under the *Forestry Act 1959*

Category C ESAs are identified under the Streamlined model conditions for petroleum activities (DES 2016) and may include any of the following environments: areas listed as essential habitat for threatened fauna or Of Concern REs (as listed under the EP Act).

Application requirements for an EA provide for ‘protection zones’ being established around ESAs including:

- Primary protection zone – an area within 200 m from the boundary of a Cat A, B or C ESA, or
- Secondary protection zone – an additional area of 100 m from the boundary of the primary protection zone placed around a Cat A and B ESA (DES 2016)

3.2.2 Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NC Act) regulates environmental impacts of development through the requirement for vegetation clearing permits, species management programs and other permits.

A clearing permit is required to clear protected plants unless an exemption applies. In general, clearing of Critically Endangered, Endangered, Vulnerable or Near Threatened protected plants will require a clearing permit. Clearing permit applications are assessed on a case-by-case basis and approvals will be subject to conditions.

Where activities involve tampering with ‘animal breeding places’, the tampering may be authorised by application to DES through an approved species management program.

3.2.3 Vegetation Management Act 1999

The *Vegetation Management Act 1999* (VM Act) regulates clearing of native vegetation in Queensland. The VM Act aims to conserve Queensland’s biodiversity through vegetation management. The intent of the VM Act is to regulate the clearing of native vegetation in a way that:

- Conserves remnant vegetation
- Ensures clearing does not cause land degradation
- Prevents loss of biodiversity
- Maintains ecological processes
- Reduces greenhouse gas emissions
- Allows for sustainable land use

3.2.4 Environmental Offsets Act 2014

Under the *Environmental Offsets Act 2014* (Offsets Act) an environmental offset is defined as ‘an activity undertaken to counterbalance a SRI of a prescribed activity on a PEM. PEMs are described as MSES and defined under Schedule 2 of the Offsets Regulation. Where a SRI is assessed as occurring on a PEM there may be a requirement for environmental offsets to compensate for the impact. The Queensland Environmental Offsets Policy Significant Residual Impact Guideline (QEOP Guideline) (DEHP 2014) provides the framework for assessing the potential for SRIs to MSES from a project’s activities.

3.2.5 Fisheries Act 1994

The *Fisheries Act 1994* (Fisheries Act) provides for the management, use, development and protection of fish habitats and resources. This includes waterways potentially used for 'fish passage' (considered as a MSES) as mapped within waterways for waterway barrier works mapping administered by the Department of Agriculture and Fisheries (DAF). Environmental offsets may be required where SRI to waterways for fish passage are identified (including permanent, partial and temporary barriers).

3.2.6 Biosecurity Act 2014

The *Biosecurity Act 2014* (Biosecurity Act) ensures a consistent, modern, risk-based and less prescriptive approach to biosecurity in Queensland. The Biosecurity Act provides comprehensive biosecurity measures to safeguard the economy, agricultural and tourism industries, environment and way of life from pests, diseases and contaminants. Decisions made under the Biosecurity Act will depend on the likelihood and consequences of risk, allowing for more appropriate management of risks.

Comet Ridge have a statutory duty of care ("general biosecurity obligation (GBO)") under the Act (s23). Under the GBO, Comet Ridge must:

- Take all reasonable and practical steps to prevent or minimise each biosecurity risk
- Minimise the likelihood of causing a 'biosecurity event', and limit the consequences if such an event is caused
- Prevent or minimise the harmful effects a risk could have, and not do anything that might make any harmful effects worse

Under the Biosecurity Act there are seven categories of 'restricted matter' with associated restrictions. Several categories may apply to a single 'restricted matter' and include the following (as relevant to the Project):

- Category 3: You must not distribute this restricted matter. This means it must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit
- Category 4: You must not move this restricted matter to ensure that it does not spread into other areas of the State
- Category 5: You must not keep in your possession this category of restricted matter
- Category 6: You must not feed this category of restricted matter. Feeding for the purpose of preparing for or undertaking a control program is exempted

4 ASSESSMENT METHODS

The ecological assessment for the Project consisted of a desktop review of publicly available ecological data sources and information. The desktop review was followed by two seasonal field surveys carried out within the Project area to describe the ecological values present on the site and to aid the evaluation of the potential impacts of the Project to values considered important to MNES. A summary of the assessment methods is provided in the following sections.

4.1 Desktop Assessment

Prior to commencing the field survey, desktop assessments were carried out to identify species and ecological communities of conservation significance (both MNES and MSES) that potentially occur within the Project area. Flora and fauna values of conservation significance in this report refer to:

- Flora and fauna species listed as Critically Endangered, Endangered or Vulnerable under the EPBC Act and the NC Act
- Regional Ecosystems listed as Endangered or Of Concern under the EP Act
- Fauna species listed as Migratory under the EPBC Act due to their inclusion under one or more of the following:
 - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
 - China-Australia Migratory Bird Agreement (CAMBA)
 - Japan-Australia Migratory Bird Agreement (JAMBA)
 - Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)

The desktop assessment also aimed to identify other environmental values relevant to the site including ESAs and MSES.

4.1.1 Data Sources

Flora and fauna records listed in publicly available databases and other resources were investigated to identify ecological matters relevant to the Study area. These resources included the following:

- DCCEEW Protected Matters Search Tool (PMST) (records within a 50 km radius of the point -24.0489, 148.6281, located in the centre of the site) (**Appendix A**)
- Queensland Government Wildlife Online (WildNet) database (records within a 50 km radius around the point -24.0489, 148.6281) (**Appendix A**)
- Species Profile and Threats Database maintained by DCCEEW (DCCEEW 2023)
- Atlas of Living Australia (ALA), a web-based search tool that is a partnership between CSIRO, Australian museums, herbaria and other biological collections, and the Australian Government (ALA 2023)
- DES MSES mapping
- DES Map of ESAs (**Appendix A**)
- Department of Resources (DoR) Regulated Vegetation Management Map and Vegetation Management Supporting Map, including Regional Ecosystems (RE), essential habitat, watercourse and wetland mapping
- DES certified RE mapping (Version 12.01)

4.1.2 Previous Studies

There has been extensive ecological assessment work in the local area in recent years, some of which includes lands within or adjacent to the current Study area. Where considered relevant, the desktop assessment and discussion of field results within this assessment includes information from the following reports:

- *Mahalo Gas Project: Ecology technical report* (Golder 2018) – project encompassed lands to the immediate south and south-east of the current Study area

- *Blackwater terrestrial ecology survey report* (EMM 2022) – project encompassed lands within the eastern portion of the current Study area (on Togara property) as well as lands to the immediate east

4.2 Field Assessment Methods

4.2.1 Survey Timing and Conditions

Two rounds of field surveys were completed, including a baseline flora and fauna assessment, REs and threatened fauna habitat during 4-7 April 2022 and a follow-up targeted threatened fauna survey including trapping and spotlighting during 30 January – 3 February 2023.

The nearest weather station providing continuous temperature and rainfall data is the Rolleston Airport station (approximately 41 km to the south). During the April 2022 survey temperatures ranged between 21.9 and 38.9 degrees Celsius (°C). For the January-February 2023 survey, temperature ranged from a minimum of 21.4 and a maximum of 36.2°C (BoM 2023). Patchy rain fell on the Study area during the survey period. The region recorded 269.2 millimetres (mm) of rainfall in the three months prior to the field survey, which is slightly more than the long-term average for this time period (248.5 mm). Over 135 mm was recorded in January prior to the survey (BoM 2023).

4.2.2 Limitations

In accordance with the *Terrestrial vertebrate fauna survey guidelines for Queensland* (Eyre et al. 2022) surveys in the Brigalow Belt Bioregion should be carried out in spring to early summer (September to mid-November) and autumn (March-mid-May). The 2022 survey was carried out in the autumn period. A survey planned to be carried out in November 2022 was cancelled due to the onset of heavy rains affecting site access. This survey was forced to be rescheduled to February 2023.

Site access during the surveys was restricted to two properties: Togara and Meroo Downs. Project infrastructure located outside the boundary of these properties has been assessed via desktop review only.

4.2.3 Baseline Flora and Fauna Assessment – April 2022

Native vegetation within the Study area was assessed and mapped into analogous REs. The survey and mapping of REs was in accordance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland V6.0* (Neldner et al. 2022). A combination of secondary and quaternary RE sites were used to verify the on-ground vegetation communities present. Rapid assessments were carried out where simple confirmation of the RE present was considered based on the results of the more detailed quaternary assessments carried out elsewhere at the Study area.

Secondary sites were used to identify REs with the quantification of vegetation community condition and floristic species composition. At a minimum the following data were recorded at each quaternary survey site:

- RE type
- Vegetation condition
- Dominant, co-dominant, sub-dominant and associated flora species, median height and cover for each strata level
- Ecologically dominant layer (EDL)
- Structural classification (Specht & Specht 2000) (i.e. grassland, open-woodland, woodland etc.)
- Structure category (i.e. dense, mid-dense, sparse, very sparse)
- Landform
- Soil type
- Weed species and density
- Disturbance

Quaternary were used to ground-truth the extent, classification and condition of vegetation communities within the Project area. At each quaternary site the following data were recorded:

- RE type

- Condition (i.e. remnant, regrowth, non-remnant)
- Dominant flora species at each strata level
- EDL strata
- EDL cover and median height
- Structural classification (Specht & Specht 2000) (i.e. grassland, open-woodland, woodland etc)

The flora survey site locations are shown in **Figure 8**. Site data sheets and an overall list of flora species present within the Study area was derived from the flora assessment (refer **Appendix B**). General searches for threatened flora species derived from the desktop review were carried out where suitable habitat was observed at flora sites.

The fauna assessment comprised non-invasive methods and included the following:

- Bird surveys and habitat searches for herpetofauna at habitat assessment points
- Deployment of an Anabat Swift microbat call detector for two nights
- One night of spotlighting
- Opportunistic observations throughout the survey

Fauna habitat assessments were conducted at sites across the Study area to ascertain the quality and availability of habitat, particularly for the potential presence of Ornamental Snake (*Denisonia maculate*).

Thirty-five assessment sites were selected during the fauna surveys and assessed for the following features:

- Ground cover
 - Grass cover
 - Bare ground
 - Non-native cover
- Presence of gilgais and cracking clay soils
- Nearby water source
- Tree hollows
- Woody debris
- Level of cattle disturbance (lack of grass cover and surface soil trampling)

4.2.4 Targeted Threatened Fauna Survey – January-February 2023

The terrestrial fauna survey catalogued all species of terrestrial vertebrates recorded within and immediately adjacent to the project area with consideration of the methods described in the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al. 2022). The recommended survey guidelines for Ornamental Snake were also considered in this methodology from the *Draft Referral guidelines for the nationally listed Brigalow Belt reptiles* (DSEWPC 2011).

A single, 2-person team fauna focussed survey led by a senior fauna ecologist carried out a five-day four-night trapping program and observations of fauna within the Study area during the January-February 2023 survey. The fauna survey focused particularly on Ornamental Snake which is listed as Vulnerable under the NC Act and EPBC Act. Survey conditions were considered highly suitable for detecting Ornamental Snake. There were very warm overnight temperatures with high humidity and some rainy periods, numerous scattered waterholes within the Study area, and frogs were active. Nevertheless, all terrestrial vertebrate fauna species present were documented. The trapping methods are described in **Table 1**.

Table 1. Project fauna trapping methods

Survey Method	Description	Target Taxa/Species
Elliot trapping	At each trap site, 25 Type-A Elliott Traps were placed 20-25 m apart and baited with a mix of peanut butter, oats, oil and honey. Traps were checked early in the morning. Two sets of traps were left out for four nights and a third site was left out for three nights. Total of 275 trap nights.	Small mammals
Funnel trap lines	Four pairs of funnel traps were placed per trap site. Funnel traps were arranged in two parallel lines either side of a 20-30 m long drift fence. All sites were placed in close vicinity to an adjacent waterhole	Frogs, snakes, other small-medium sized reptiles – in particular

Survey Method	Description	Target Taxa/Species
	on dark clay soils with scattered regrowth Brigalow present. Shade cloths were placed over each funnel trap to protect trapped animals during the day. Traps were operational for four nights at two survey sites and three nights at a further two sites. Traps were checked and cleared each morning and late afternoon. Total of 112 trap nights.	targeting Ornamental Snake
Spotlighting	Spotlighting was undertaken along vehicle tracks and where waterbodies were accessible (targeting Ornamental Snake). Approximately eight person hours of spotlighting was carried out within the Study area boundary across the 2022 and 2023 surveys.	Nocturnal fauna including arboreal mammals and herpetofauna
Habitat searches for herpetofauna	Inspections of potential shelter sites (e.g. fallen timber, debris, rocks, leaf litter) were carried out during the day to search for additional species (largely herpetofauna) not recorded using other survey techniques.	All herpetofauna
Bird surveys	Bird species were recorded at each systematic site during daily visits to check traps. Birds were identified by sight or call. An area with an approximate radius of 100 m around each trap-line was included in these bird censuses. At least two hours of survey effort was devoted to each site. Bird	All bird species
Opportunistic records	Searches were carried out opportunistically throughout the survey and included some records located outside the immediate boundary of the Study area.	All fauna

4.2.5 Suitably Qualified Personnel

The 2022 and 2023 surveys were led by Associate Environmental Scientist, Brett Taylor. The 2022 flora survey was carried out by Senior Environmental Scientist, Dr Oliver Robertson.

Brett Taylor

Brett completed his Honours (1st Class) degree (BSc in Ecology and Conservation Biology) in 2006 and has extensive fauna survey experience in Queensland, New South Wales and Papua New Guinea. Brett has conducted fauna work in habitats throughout Queensland for over 14 years. This includes using targeted survey techniques for a variety of conservation significant fauna. He has substantial experience carrying out ecological impact assessments and EPBC Act referrals. He has participated as a fauna expert on the expert panel review of the Biodiversity Planning Assessment for the North-west Highlands Bioregion in 2019.

Dr Oliver Robertson

With almost 9 years in the industry, Oliver has extensive experience in undertaking surveys for listed weeds and threatened fauna and flora species as part of environmental monitoring and compliance programs for projects throughout Queensland for a broad range of industries and government sectors including road and rail transport, energy, communications and defence. He is familiar with environmental legislative requirements in Queensland and NSW. Oliver is suitably qualified to complete Protected Plant Flora Surveys under the Queensland Department of Environment and Science Protected Plants Flora Survey Guidelines (DES 2020). Oliver holds a PhD in Ecology from the University of Queensland as well as a Bachelor of Environmental Science and a Bachelor of Science (Zoology) from Deakin University and University of Melbourne respectively.

4.2.6 Permits and Ethics Approvals

The field surveys were conducted in accordance with the following Queensland government permits and approvals:

- Scientific Use Registration Certificate (Department of Agriculture and Fisheries) – Registration No. SUR001535)
- Animal Ethics Approval (Department of Agriculture and Fisheries) – (Reference No. CA 2020/06/1377)
- Research Permit (DES) – Permit No. WA0027840

4.3 Likelihood of Occurrence Assessment

Following the field survey, a likelihood of occurrence assessment was completed to categorise the potential for threatened flora and fauna to occur based on the habitat observed within the Project area and surrounds (refer **Section 0**). The assessment provides the following criteria:

- Known to occur
 - Observed onsite during surveys
- Likely to occur
 - Observed close to site during surveys and suitable habitat occurs within site, or
 - Database records occurring close to site (within 10 km) and suitable habitat occurs within site
- Potential to occur
 - Database records occurring in wider area (>10 km and <50 km) and suitable habitat occurs within the site, or
 - Database records occurring close to site (within 10 km) and marginally suitable habitat occurs although remain relatively isolated (due to vegetation clearing)
- Unlikely to occur
 - No database records in wider area and/or
 - Habitat present in generally unsuitable and/or
 - Site generally outside of known distribution of species

4.4 Nomenclature and Taxonomy

The common names of many flora and fauna species frequently vary between regions, and many species lack them altogether. Taxonomy of flora presented in this report follows that currently endorsed by the Queensland Herbarium in the Census of Queensland Flora 2021 (Queensland Herbarium 2021a). The taxonomy of fauna follows the Australian Faunal Directory (ABRS 2023). In this report, flora and fauna species are referred to initially by both their common and scientific names and then for ease of reading, only by their common name (where the species has a common name).

5 DESKTOP ASSESSMENT RESULTS

5.1 Existing Environment

The Project is located within the Brigalow Belt North Bioregion (BBNB). Within the BBNB the Project area lies within the Isaac-Comet Downs subregions. Large areas of the Brigalow Belt have been cleared of remnant native vegetation for grazing, agriculture and mining. Remaining vegetation is often confined to rockier hilly areas, linear strips of roadside vegetation, riparian vegetation and relatively small, isolated pockets of remnant vegetation.

The overall Project encompasses approximately 14,078 ha. The majority of this area has been cleared for domestic livestock grazing. Extant tracts of vegetation communities remain disturbed to some degree (previous tree clearing and existing cattle grazing) and largely occur in the north and north-east of the Study area and along the Comet River to the west of the Study area. Lands subject to clearing occur in all directions surrounding the Study area. Lands to the west of the Comet River appear subject to cropping. The remaining area comprises areas which have been subject to extensive disturbance including tree clearing and blade ploughing to discourage regrowth. The Study area contains agricultural infrastructure such as fencing, water storage dams, cattle yards and unsealed tracks. Land to the north and northwest of the Project area has been substantially impacted by vegetation clearing associated with cattle grazing activity. The Comet-Rolleston Road intersects the far eastern portion of the Study area.

5.1.1 Topography, Geology and Soils

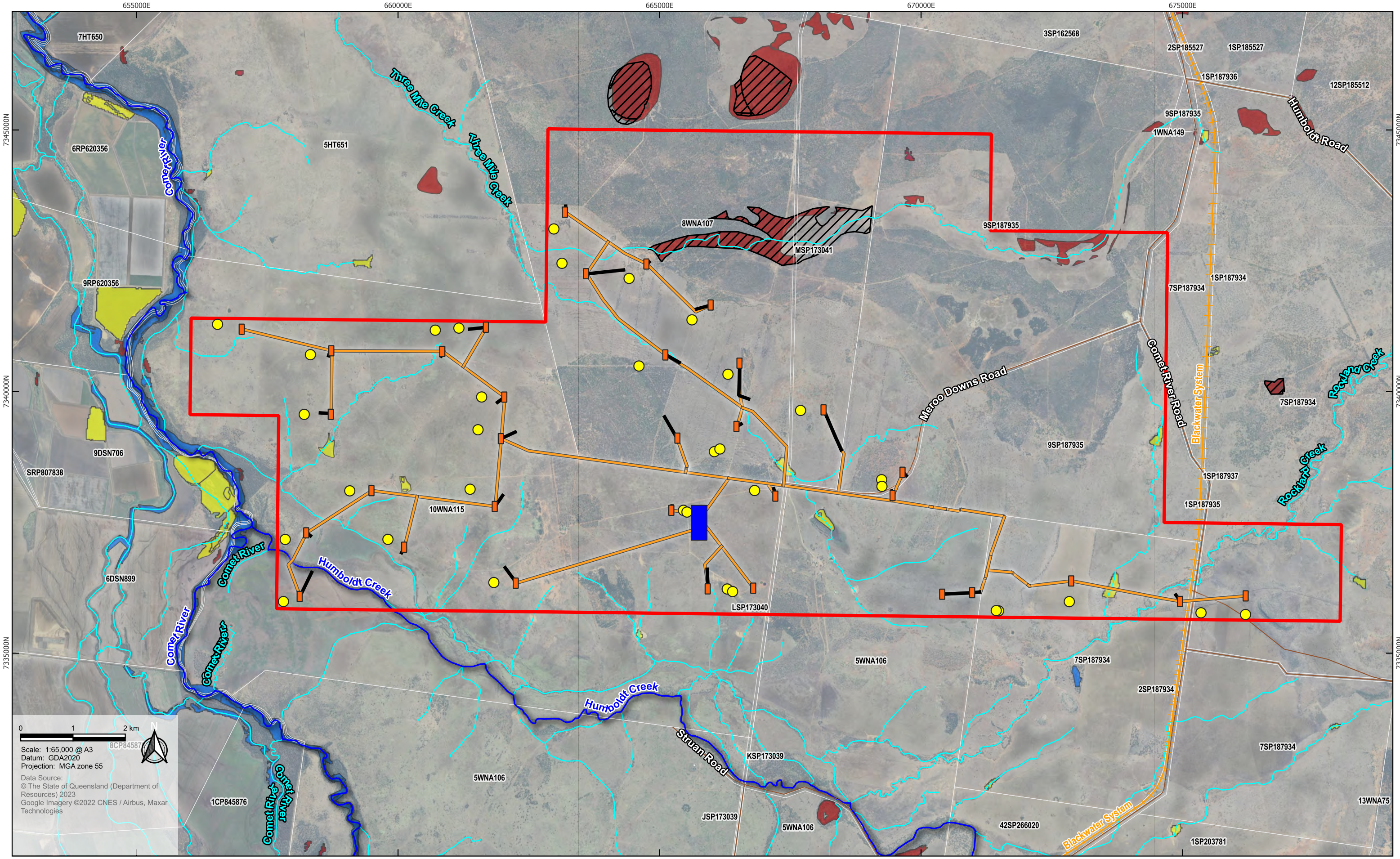
The Study area comprises grey self-mulching cracking clays and red massive earths on undulating plains. Topography descends in a relatively even manner from 240 m Australian Height Datum (AHD) at the eastern boundary of the Study area to 182 m AHD at the south-western boundary to the alluvial flats associated with the Comet River. The dominant geological substrate of the Study area is sedimentary rock associated with the Emerald Formation and alluvium associated with Humboldt Creek (refer **Table 2**). Isolated pockets of basalt occur adjacent to Humboldt Creek.

Table 2. Study area surface geology (QGlobe 2023)

Rock unit name	Lithological summary	Dominant rock	Age
Emerald formation	Deeply weathered fluvial and lacustrine claystone and siltstone, quartzose sandstone, pebbly sandstone, gravel, lignite, oil shale, interbedded basalt	Sedimentary rock	Eocene
Qa-QLD	Clay, silt, sand and gravel; flood-plain alluvium	Alluvium	Quaternary
Tb-QLD	Mostly olivine basalt flows and some plugs; some areas of nephelinite, basanite	Basalt	Tertiary

5.1.2 Wetland and Watercourse Mapping

The Project is located within the Comet River catchment which is part of the Fitzroy River Basin. The overall Project area is intersected by 14 stream order 1 watercourses, one stream order 2 watercourses, one stream order 5 watercourse, and one stream order 6 watercourse. A wetland of high ecological significance (HES) and surrounding trigger area is mapped in the northern portion of the Study area (refer **Figure 3**). The only major watercourse associated with the Study area is Humboldt Creek which intersects the south-west corner. The Comet River is located adjacent to, but outside the western boundary of the Study area (QGlobe 2023).



Filepath: -BAA\BAA220014.01 -Comet Ridge Mahalo North\Workspaces\BAA220014.01 Mahalo North\1_Petroleum Lease\2_Terrrestrial Ecology\EAR\Rev 2\Figure 3 Wetland and watercourse mapping for Study area.qgz

Scale: 1:65,000 @ A3
 Datum: GDA2020
 Projection: MGA zone 55

Data Source:
 © The State of Queensland (Department of Resources) 2023
 Google Imagery ©2022 CNES / Airbus, Maxar Technologies

Legend	
Petroleum Lease Boundary	Gas compression facility
Cadastre (DCDB)	New access tracks
Roads and tracks	Indicative gathering lines
Railways	
Infrastructure (indicative only)	Gas production wells
	Indicative lateral well
	Indicative vertical well
Vegetation management watercourse V7.0	
Major	
Minor	
Wetland areas (Qld Wetland Mapping v5.0)	MSES - High ecological significance wetlands
Lacustrine	
Palustrine	
Riverine	

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Figure 3
Wetland and watercourse mapping for study area

5.2 Matters of National Environmental Significance

The DCCEEW Protected Matters Report (PMR) identifies MNES protected under the EPBC Act considered as potentially occurring within the Study area and surrounds. The PMR identified three categories of MNES potentially present (as summarised in **Table 3**). A copy of the PMR is provided in **Appendix A**.

Table 3. EPBC Act PMR summary

MNES	PMR search result and relevance to Project
World heritage properties	Not applicable
National heritage places	Not applicable
Wetlands of International Importance	Not applicable
Great Barrier Reef Marine Park	Not applicable
Commonwealth Marine Area	Not applicable
Listed Threatened Ecological Communities (TECs)	Five TECs predicted to be present (refer Section 5.5.2 for further information)
Listed threatened species:	Twenty-six species listed as threatened predicted to be present including seven flora species and 19 fauna species (refer Section 0 and Section 6.2.3 for further information)
Listed migratory species	Nine species listed as migratory predicted to be present (refer Section 6.2.3 for further information)

5.3 Matters of State Environmental Significance

The Offsets Act is supported by the Offsets Regulation which provides detail on prescribed activities and environmental matters (i.e. MSES) to which the Act applies. MSES include environmental values that are protected under Queensland legislation. The Queensland Government Environmental Reports Online portal identified six MSES as present within the Study area (as summarised in **Table 4**).

Table 4. Matters of State Environmental Significance relevant to the Study area

Matters of State Environmental Significance	Relevance to Project
Wetlands in a wetland protection area or wetlands of high ecological significance as listed under the Environmental Protection Regulation 2019	There is a large area mapped as a Wetland Protection Area with an associated 500 m buffer area located in the north of the Study area (refer Figure 3).
Protected wildlife habitat for species listed as threatened or special least concern (NC Act) fauna or flora as listed under the NC Animals Regulation/NC Flora Regulation	There are patches of protected wildlife habitat located throughout the Study area. These largely occur on Togara and are considered to provide core habitat for Ornamental Snake (refer Section 5.6 and Figure 5).
Regulated vegetation under the VM Act:	
Category B (remnant) areas on the regulated vegetation management map, that are 'endangered' and 'of concern' regional ecosystems	There are a number of polygons mapped as present comprising vegetation listed as endangered under the VM Act. These largely occur on Togara property. Meroo Downs comprises polygons on the southern boundary of the Study area comprising vegetation listed endangered and of concern (refer Section 5.5.1 and Figure 5).
Essential habitat on the essential habitat map for wildlife prescribed as critically endangered, endangered or vulnerable under the NC Act	There are patches of essential habitat located throughout the Study area. These largely occur on Togara and are considered to provide habitat for Ornamental Snake.
Regulated vegetation located within a defined distance from the defining banks of a relevant watercourse identified on the VM Act watercourse and drainage feature map	Watercourse mapping intersects very little regulated vegetation within the Study area (refer Figure 3). This largely occurs in two vegetation polygons on Togara property.
Regulated vegetation management located within a wetland or within 100 metres from the defining bank of a wetland identified on the VM Act wetlands map	Two mapped wetland areas occur in the north of the Study area on Togara property (refer Figure 3).

5.4 Environmentally Sensitive Areas

Mapping indicates the following ESAs occur within the Study area (refer **Figure 4**):

- Category B – Vegetation (remnant and regrowth) listed as endangered under the EP Act (Biodiversity status). This includes vegetation identified as non-remnant under VM Act RE mapping
- Category C – Essential habitat for wildlife prescribed as critically endangered, endangered or vulnerable under the NC Act
- Category C - Of Concern Regional Ecosystems – Remnant (Biodiversity Status)

5.5 Flora

5.5.1 Vegetation Communities

Current Queensland regulated vegetation mapping indicates the majority of the Study area is considered as Category X (Non-remnant) vegetation. Areas in the centre and northern extents of the Study area are mapped as Category B (Remnant) and Category C (High-value Regrowth). The extents of this mapping are detailed in **Table 5**. Current DoR vegetation community mapping identifies 13 REs within the Study area mapped as a mix of homogeneous and heterogenous polygons. The REs are described in **Table 6** and depicted in **Figure 5**.

Table 5. Regulated vegetation mapped within the Study area

Regulated Vegetation category	Extent (ha)
Category B (Remnant)	2,079.16
Category C (High-value Regrowth)	170.27
Category X (Non-remnant)	11,828.83

Table 6. Regional ecosystems currently mapped within Study area

Regional Ecosystem	Short description (Queensland Herbarium 2021b)	VM Act Status	EP Act Status
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	Endangered	Endangered
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	Of concern	Of concern
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	Endangered	Endangered
11.4.9	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	Endangered	Endangered
11.4.9a	<i>Acacia harpophylla</i> , <i>Lysiphyllum carronii</i> +/- <i>Casuarina cristata</i> open forest to woodland. Not a Wetland	Endangered	Endangered
11.5.2	<i>Eucalyptus crebra</i> , <i>Corymbia</i> spp., with <i>E. moluccana</i> woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	Least Concern	No Concern
11.5.3	<i>Eucalyptus populnea</i> +/- <i>E. melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	Least Concern	No Concern
11.5.9	<i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. And <i>Corymbia</i> spp. Woodland on Cainozoic sand plains and/or remnant surfaces	Least Concern	No Concern
11.5.9b	<i>Eucalyptus crebra</i> , <i>E. tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. Woodland. Not a Wetland	Least concern	No concern at present

Regional Ecosystem	Short description (Queensland Herbarium 2021b)	VM Act Status	EP Act Status
11.5.16	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest in depressions on Cainozoic sand plains and remnant surfaces	Endangered	Endangered
11.7.2	<i>Acacia</i> spp. Woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Least concern	No concern at present
11.8.4	<i>Eucalyptus melanophloia</i> woodland to open woodland on Cainozoic igneous rocks.	Least concern	No concern at present
11.8.5	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks	Least concern	No concern at present

5.5.2 Threatened Ecological Communities

The PMST report identifies the following five TECs as possibly present with the Study area:

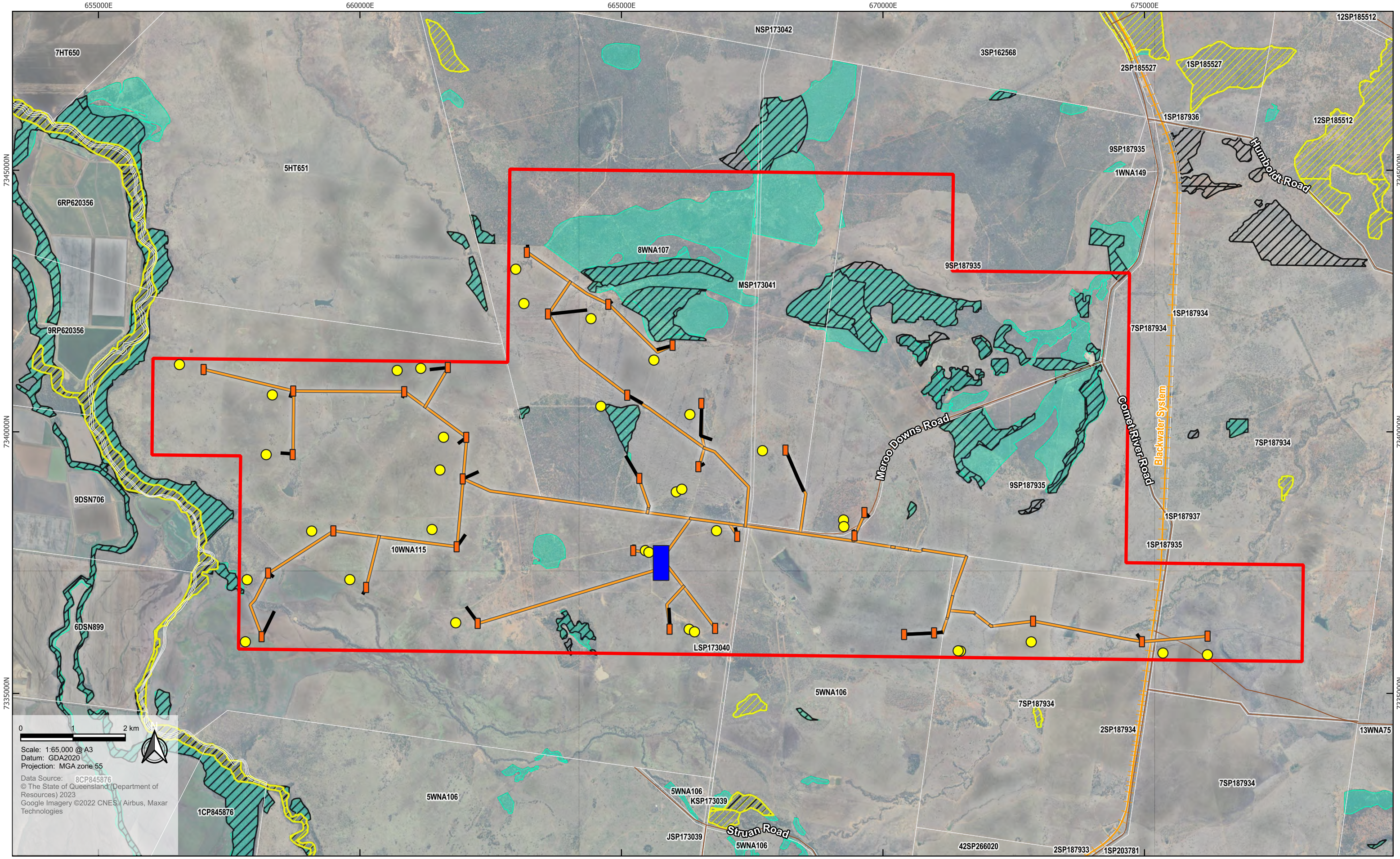
- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin
- Poplar Box Grassy Woodland on Alluvial Plains
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions
- Weeping Myall Woodlands

There are three REs mapped as present within the Study area which are considered analogous to the Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC: RE 11.4.8, 11.4.9 and 11.5.16 (refer **Figure 5**).

5.5.3 Conservation Significant Flora

The desktop review identified eight flora species listed as threatened under the NC Act and/or EPBC Act as potentially occurring within the wider area surrounding the site (refer **Appendix A** for database search results). The PMR predicted the potential presence of seven flora species listed as Vulnerable or Endangered under the EPBC Act and/or NC Act. The Wildlife Online search results identified one additional flora species listed as Vulnerable under the EPBC Act and/or Endangered or Near threatened under the NC Act. The Wildlife Online search results also identified 12 flora species listed as Special Least Concern (SLC) under the NC Act (refer to **Figure 7**).

- *Aristida annua* (Vulnerable – NC Act and EPBC Act) – One record (1993) located 6 km north of the Study area, two records (1971-1995) located south-west within 50 km of the Study area
- *Bertya opposens* (Least Concern – NC Act, Vulnerable – EPBC Act) – Seven records (1985-2019) located within 50 km north-east of the Study area. (1934-1999)
- *Cadellia pentastylis* (Vulnerable – NC Act and EPBC Act) – Two records (1991-1996) located 25 km northeast of the Study area. One record (2011) located 31 km south of the Study area
- *Dichanthium queenslandicum* (Vulnerable – NC Act, Endangered – EPBC Act) -17 records exist within 50 km of the Study area to the north, west and south-west
- *Dichanthium setosum* – (Least Concern – NC Act, Vulnerable – EPBC Act) – Three records 35-50 km south west of the Study area from 2018
- *Leichhardtia brevifolia* (Vulnerable – EPBC Act) – Six records (1985-2004) located within 50 km east of the Study area (high uncertainty on the coordinate precision of the record location associated with a single 1990 record)
- *Solanum dissectum* (Endangered – NC Act and EPBC Act) – Four records (2010-2019) located within 40 km northeast of the Study area
- *Solanum elachophyllum* (Endangered – NC Act) – 10 records (1964-2019) located within 50 km of the Study area to the northeast, east and southeast (high uncertainty on the coordinate precision of the record location associated with a 1964 and 2015 record). In addition a total of five individuals of the species were identified within the Study area during 2019 (EMM 2022)



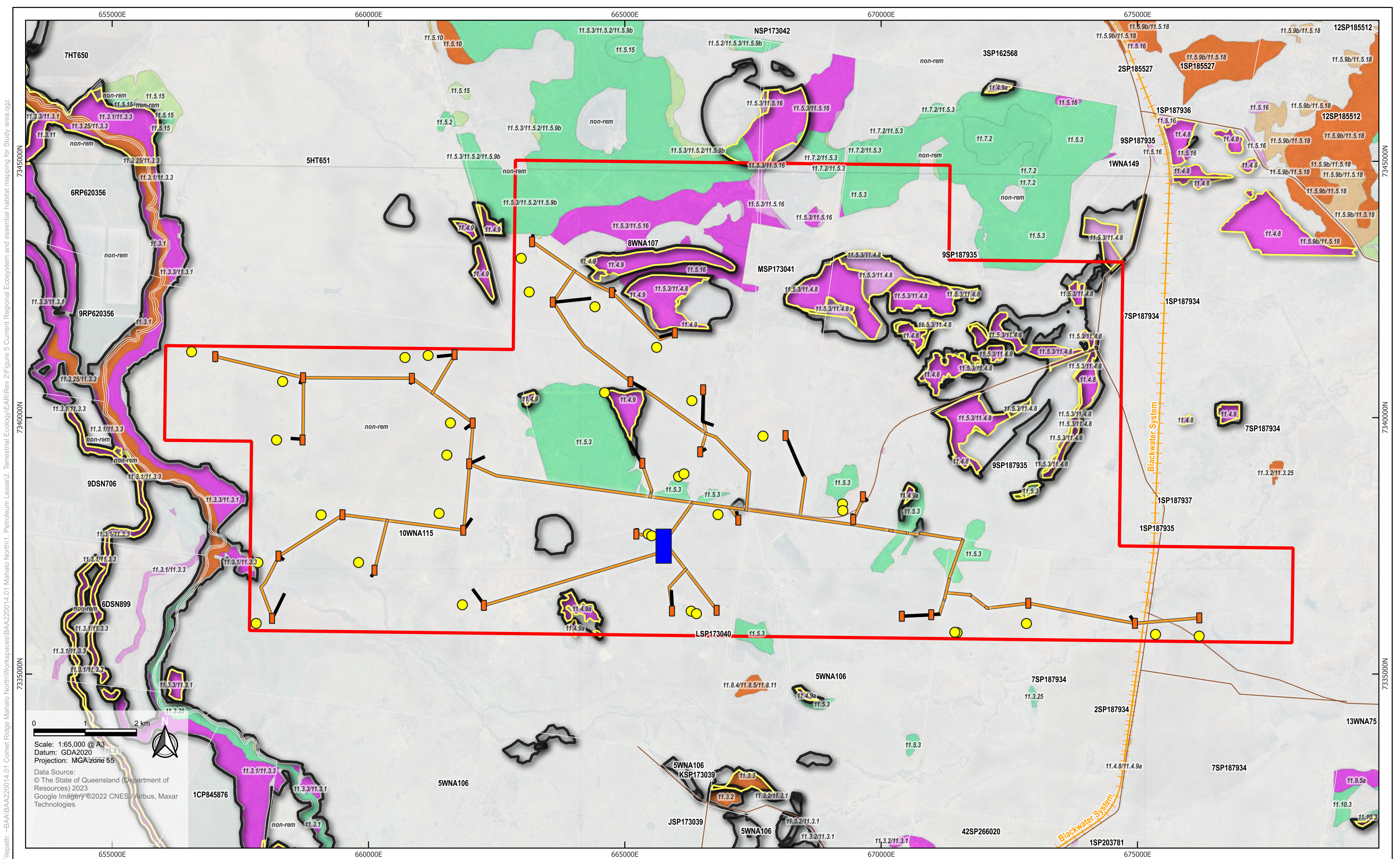
Scale: 1:65,000 @ A3
 Datum: GDA2020
 Projection: MGA zone 55
 Data Source: 8CP845876
 © The State of Queensland (Department of Resources) 2023
 Google Imagery ©2022 CNES / Airbus, Maxar Technologies

Legend		Gas production wells	Environmentally Sensitive Areas
Petroleum Lease Boundary	Infrastructure (indicative only)	Indicative lateral well	Cat B ESA - Endangered Regional Ecosystems (Remnant and Regrowth)
Cadastre (DCDB)	Gas compression facility	Indicative vertical well	Cat C ESA - Essential Habitat
Roads and tracks	New access tracks	Indicative gathering lines	Cat C ESA - Of Concern Regional Ecosystems
Railways			



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Figure 4
 Environmentally sensitive areas
 mapping for study area



Scale: 1:65,000 @ A3
 Datum: GDA2020
 Projection: MGA'zónie 55
 Data Source:
 © The State of Queensland (Department of Resources) 2023
 Google Imagery ©2022 CNES / Airbus, Maxar Technologies

Legend		Regional Ecosystems v12.02	
Petroleum Lease Boundary	Gas compression facility	Vegetation management essential habitat v11.04	Category C or R area containing endangered
Cadastre (DCDB)	New access tracks	MSES - Wildlife habitat (endangered or vulnerable)	Category C or R area containing of concern
Roads and tracks	Indicative gathering lines	Category A or B area containing endangered	Category C or R area that is of least concern
Railways	Indicative lateral well	Category A or B area containing of concern	Non-remnant
Indicative lateral well	Indicative vertical well	Category A or B area that is least concern	



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Figure 5
 Current Regional Ecosystem and essential habitat mapping for study area

5.6 Conservation Significant Fauna

5.6.1 Habitat Mapping

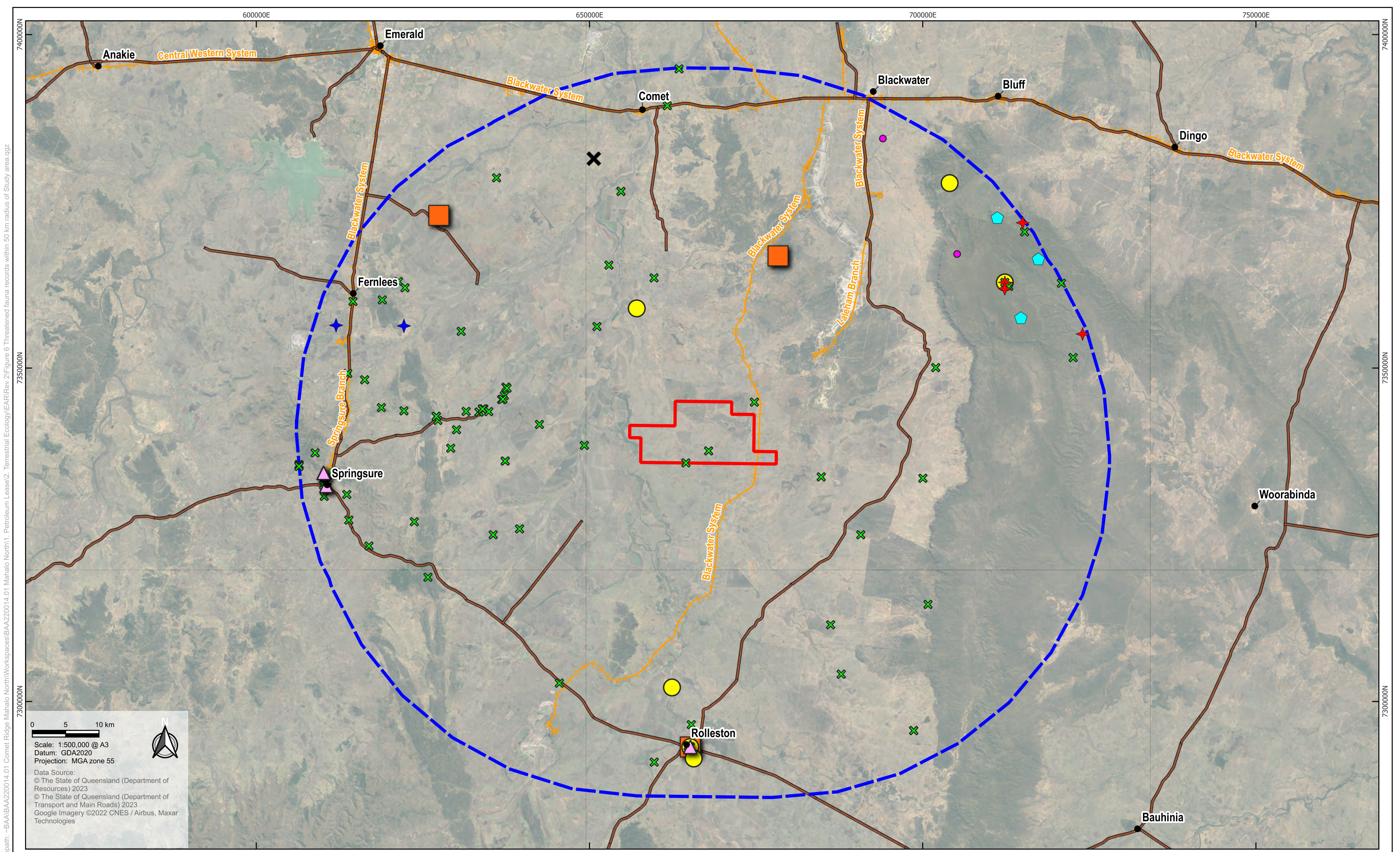
Assessment of DES habitat mapping for threatened fauna species (refer **Figure 5**) indicates there are areas located across Togara and to a lesser extent within Meroo Downs which are considered suitable for Ornamental Snake. Habitat along the Comet River is also considered suitable for Ornamental Snake.

An area within Togara located to the immediate north of the Study area and is considered as habitat for Australian Painted Snipe (*Rostratula australis*). Based on the shape of this particular area it appears to be based on a previous record of the species, rather than habitats based on REs (as for Ornamental Snake).

5.6.2 Threatened Fauna Species Records

The desktop review identified 20 fauna species listed as threatened and 12 fauna species listed as migratory under the NC Act and/or EPBC Act as potentially occurring within the wider area surrounding the site (refer **Appendix A** for database search results). The PMR predicted the potential presence of 19 fauna species listed as Vulnerable or Endangered and nine species listed as migratory under the EPBC Act and/or NC Act. The Wildlife Online search results identified three additional fauna species listed as migratory under the NC Act. Threatened species identified as occurring within 50 km of the Study area from the ALA (2023) database include the following (refer **Figure 6** for locations):

- Red Goshawk (*Erythrotriorchis radiatus*) (Vulnerable – EPBC Act, Endangered – NC Act) – Several records (1996-1998) located 41-51 km northeast of the Study area. Scattered records in the wider region surrounding the Study area but all are older (pre 1981)
- Australian Painted Snipe (Endangered – NC Act and EPBC Act) – Two undated Birdlife Australia records located 38 km and 47 km west of the Study area
- Squatter Pigeon (southern) (*Geophaps scripta scripta*) (Vulnerable – NC Act and EPBC Act) - Two records undated Birdlife Australia records located 15 km and 24 km north of the Study area (high uncertainty on the coordinate precision of the record location associated with these records)
- Grey Falcon (*Falco hypoleucos*) (Vulnerable – NC Act and EPBC Act) – Sparse records scattered in the wider area surrounding the Study area. Nearest record located 41 km east of the Study area. All of these records are older (pre 1981)
- Painted Honeyeater (*Grantiella picta*) (Vulnerable – NC Act and EPBC Act) – Two records (1985-2017) located 38 km and 48 km north-east of the Study area
- Northern Quoll (*Dasyurus hallucatus*) (Endangered – EPBC Act, Least Concern – NC Act) – Three records (1967-1975 and one undated) located 47 km west of the Study area. One record (1997) located 41 km south
- Greater Glider (*Petauroides volans*) (Endangered – NC Act and EPBC Act) – Multiple records located northeast at least 38 km from the Study area. Closest records (1997) located 24 km south of the Study area. Several records (2012 and 2016) located south and west including relatively recent records near Springsure (48 km west)
- Koala (*Phascolarctos cinereus*) (Vulnerable – EPBC Act, Vulnerable – NC Act) – Large number of database records in wider area including two records (1976 and 1996) within the Study area itself. Most records are older (pre1990). Nearest recent record (2012) located 17 km south-east of the Study area
- Ornamental Snake (Vulnerable – EPBC Act, Vulnerable – NC Act) – Nearest database records located approximately 25 km to the north (1995) and 45 km to the north-west (1977). Recorded during surveys for other projects in the wider area (Golders 2019; EMM 2022). All sightings were located west of the Comet-Rolleston Road despite targeted surveys for the species within the east of the current Study area (EMM 2022) and to the immediate south (Golders 2019).
- Grey Snake (*Hemiaspis damelii*) (Endangered - EPBC Act, Endangered – NC Act) - One record (2003) located 39 km north of the Study area



0 5 10 km

Scale: 1:500,000 @ A3
 Datum: GDA2020
 Projection: MGA zone 55

Data Source:
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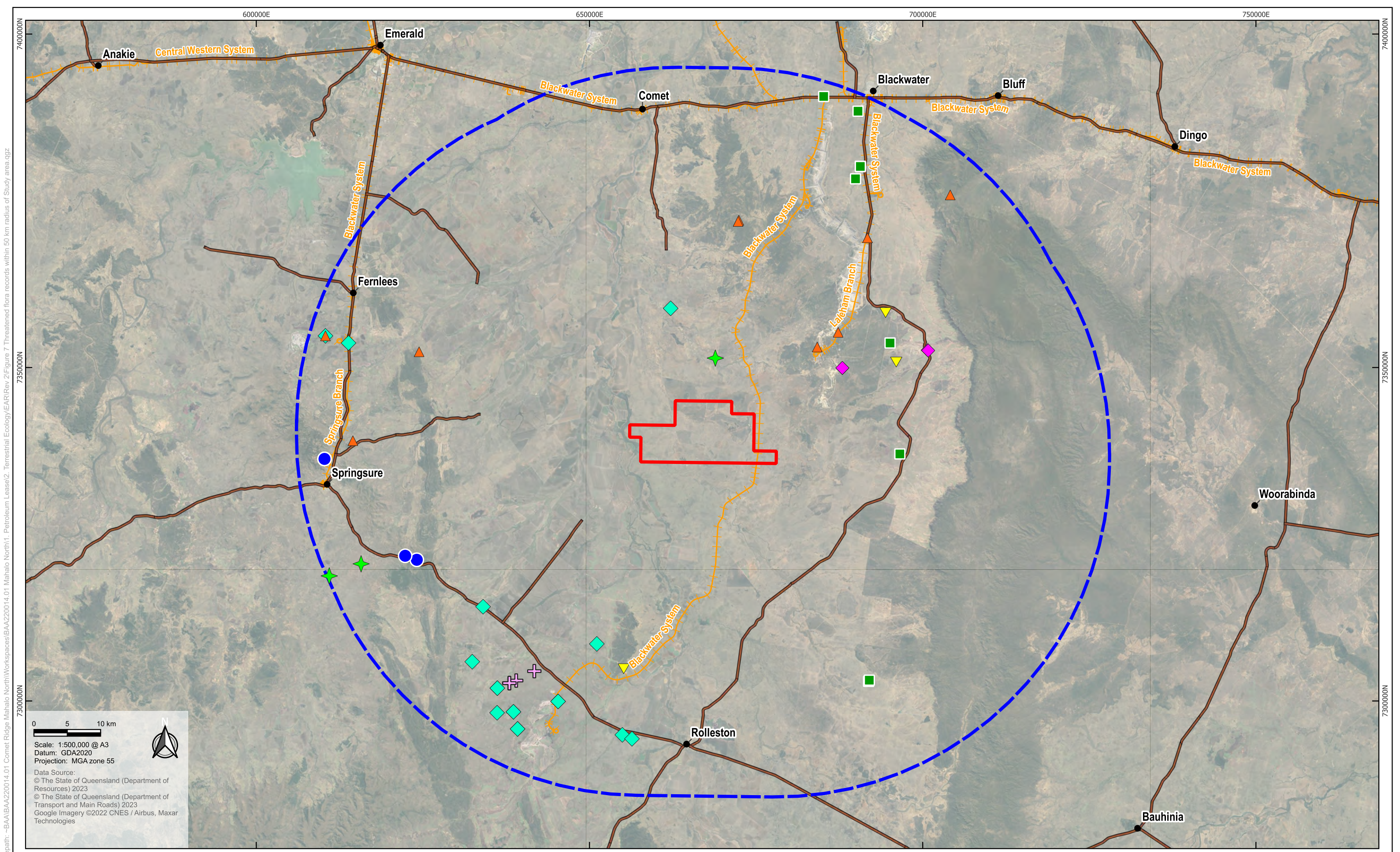
Legend

- | | | | | | | | | | | | |
|--------------------------|--------------------------|------------------------|-------------|---------------------------------|------------|----------------|------------------|--------------------|--------------------|---------------------------------------|---------------------------------------|
| Petroleum Lease Boundary | 50 km buffer | State controlled roads | Railways | Threatened fauna records | Grey Snake | Koala | Northern Quoll | Ornamental Snake | Painted Honeyeater | Red Goshawk | Squatter Pigeon (southern subspecies) |
| | Australian Painted-snipe | Greater Glider | Grey Falcon | Grey Snake | Koala | Northern Quoll | Ornamental Snake | Painted Honeyeater | Red Goshawk | Squatter Pigeon (southern subspecies) | |



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Figure 6
 Threatened fauna records within 50 km
 radius of study area



Filepath: -BAA\BAA220014.01 Comet Ridge Mahalo North\Workspaces\BAA220014.01 Mahalo North\1. Petroleum Lease\2. Terrestrial Ecology\EAR\Rev 2\Figure 7 Threatened flora records within 50 km radius of Study area.qgz

0 5 10 km

Scale: 1:500,000 @ A3
Datum: GDA2020
Projection: MGA zone 55

Data Source:
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Legend

- | | | | |
|--------------------------|---------------------------------|-----------------------------------|------------------------------|
| Petroleum Lease Boundary | Threatened flora records | <i>Dichanthium queenslandicum</i> | <i>Solanum dissectum</i> |
| 50 km buffer | <i>Aristida annua</i> | <i>Dichanthium setosum</i> | <i>Solanum elachophyllum</i> |
| State controlled roads | <i>Bertya opposens</i> | <i>Leichhardtia brevifolia</i> | |
| Railways | <i>Cadellia pentastylis</i> | | |



**Comet Ridge
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Figure 7
Threatened flora records within
50 km radius of study area

6 FIELD ASSESSMENT RESULTS

6.1 Flora Survey Results

6.1.1 Flora Diversity

A total of 123 flora species were identified within the site, including 14 non-native flora species. The floral assemblage is dominated by native grasses, herbs and woody shrubs. Tree species were comprised of Acacias, eucalypts and soft-wood scrub species. A full list of recorded flora species is provided in (refer **Appendix B**).

6.1.2 Ground-truthed Regional Ecosystems

A total of 20 secondary RE assessments and 27 quaternary RE assessments were completed across the Study area (refer **Figure 8**). Ground-truthing of current RE mapping confirmed the presence of six vegetation communities analogous to six RE types. There are substantial differences with the current State Government RE mapping which overstates the potential extent of Brigalow communities present within the Study area. The remaining area encompassed water bodies, and non-remnant areas impacted by vegetation clearing. The description, status and area of each RE is provided in **Table 7**, and the extent illustrated in further detail regarding vegetation community floristics, structure and representative photos is provided in the following sections. Secondary and Quaternary RE assessment data is provided in **Appendix B**.

Table 7. Ground-truthed REs within Study area

Vegetation community	RE	Regulated vegetation category	TEC	EP Act (biodiversity) status	Extent within Study area (ha)
1. Remnant Brigalow woodland	11.3.1	B	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered	21.77
	11.4.8				84.80
	11.4.9				96.49
	11.4.9a				36.65
	11.5.16				76.59
2. Regrowth Brigalow woodland	11.4.8	C	N/A	No concern at present	3.57
	11.4.9a				27.37
3. Remnant Blackwood woodland	11.4.8	B	N/A	Endangered	104.76
4. Remnant Poplar Box woodland	11.5.3	B	N/A	No concern at present	1,181.38
5. Regrowth Poplar Box woodland	11.5.3	C			289.05

6.1.2.1 Remnant Brigalow Woodland

This vegetation community occurs on a variety of soil types including alluvium, clay plains and old loamy sandy plains. The structure of the community varies from woodland to open-woodland (refer **Plate 1**). The community is dominated by Brigalow (*Acacia harpophylla*) with co-dominant Dawson Gum (*Eucalyptus cambageana*) or associated Narrow-leaved Grey Box (*Eucalyptus woollsiana*) or Belah (*Casuarina cristata*). Scattered Queensland Bottle Tree (*Brachychiton rupestris*) occasionally occur as do emergent Coolabah (*Eucalyptus coolabah*) with a median height range of 10-17 m and a canopy cover range or 15-35 percent (%). There are a number of patches in the north-east of the Study area where Brigalow has been replaced by a dense canopy cover of Blackwood (*Acacia argyrodendron*). A subcanopy typically occurs and is comprised of Brigalow, Wilga (*Geijera parviflora*), Paperbark (*Melaleuca decora*), Yellow-wood (*Terminalia oblongata* subsp. *oblongata*), False Sandalwood (*Eremophila mitchellii*) and Emu Apple (*Owenia acidula*), with a median height range of 5-11 m.

A mid-dense shrub layer always occurred and was comprised of Turkey Bush (*Eremophila deserti*), Curracabah Wattle (*Acacia crassa* subsp. *crassa*), Wilga, Boonaree (*Alectryon oleifolius* subsp. *canescens*), False Sandalwood, Slender Grape (*Clematicissus opaca*), Brigalow, Emu Apple, Dysentery Plant (*Grewia latifolia*), Currant Bush (*Carrissia ovata*) and Cocaine Bush (*Erythroxylum australe*). A secondary very low shrub layer also

typically occurred and included Currant Bush, Curracabah Wattle, Slender Grape, Goathead Burr (*Sclerolaena bicornis*), Scrub Boonaree (*Alectryon diversifolius*) and *Salsola australis*.

Ground cover was sparse and dominated by annual and perennial tussock grasses with some forbs and sedges present. Ground cover species included Hairy Panic (*Panicum effusum*), Native Millett (*Panicum decompositum*), Spreading Umbrella Grass (*Digitaria divaricatissima*), Dark Wiregrass (*Aristida calycina*), Lignum (*Duma florulenta*), Annual Pigeon Grass (*Setaria surgens*), Bottle Washers (*Enneapogon avenaceus*), Purple Wiregrass (*Aristida ramosa*) and *Salsola australis*.

Non-native plant cover ranged from 5% to 70% and included Common Pest Pear (*Opuntia stricta*), Buffel Grass (*Cenchrus ciliaris*), African Lovegrass (*Eragrostis curvula*), Harrisia Cactus (*Harrisia martinii*) and Guinea Grass (*Megathyrus maximus*). The vegetation community was subject to varying degrees of disturbance from cattle and feral animals, particularly Feral Goats and Feral Pigs. Gilgais were largely absent from the community, except for an area of RE 11.3.1 fringing a drainage line in the far western portion of the Study area.



Plate 1. Remnant Brigalow woodland

6.1.2.2 Regrowth Brigalow Woodland

This regrowth vegetation community occurs on clay plain as low woodland (refer **Plate 2**). The community is dominated by Brigalow with associated Yellow-wood and Ebony Tree (*Lysiphyllum carronii*) with a median height of 5 m and a canopy cover of 15%. A very-sparse shrub layer was comprised of Wilga and Desert Lime (*Citrus glauca*). A secondary low shrub layer of Turkey Bush also occurred.

Ground cover was sparse and dominated by tussock grasses including Spreading Umbrella Grass, Native Millett, and Rats Tail Grass (*Sporobolus creber*). Forbs were also present to a lesser degree and included Hairy Joyweed (*Alternanthera nana*), High Sida (*Sida trichopoda*), Ruby Saltbush (*Enchylaena tomentosa*), Pin Sida (*Sida fibulifera*) and Sesbania Pea (*Sesbania cannabina*).

Non-native plant cover was estimated at 5% to 30% and included invasive grasses such as Rhodes Grass (*Chloris gayana*) and Sabi Grass (*Urochloa mosambicensis*). Examples of this vegetation community within the Study area included linear patches of roadside regrowth and larger areas subject to historical thinning and clearing. Analysis of historical imagery determined that clearing of the vegetation community occurred greater than 15 years ago.



Plate 2. Regrowth Brigalow woodland

6.1.2.3 Remnant Poplar Box Woodland

This vegetation community occurs on old loamy sandy plains. The structure of the community varies from woodland to open-woodland (refer **Plate 3**). The community is dominated by Poplar Box (*Eucalyptus populnea*) with associated Silver-leaved Ironbark (*Eucalyptus melanophloia*), Brigalow, Dawson Gum, Long-fruited Bloodwood (*Corymbia clarksoniana*), Gidgee (*Acacia cambagei*), White Cypress Pine (*Callitris glaucophylla*), Queensland Bottle Tree and Budgeroo (*Lysicarpus angustifolium*), with a median height range of 10-30 m and a canopy cover range of 10-70%. A mid-dense sub-canopy typically occurs, including White Cypress Pine, Blackwood (*Acacia argyrodendron*), Yellow-wood, Brigalow, Queensland Bottle Tree, Gidgee, Quinine Tree (*Petalostigma pubescens*), Poplar Box, Leichardt Bean (*Cassia brewsteri*), Red Ash (*Alphitonia excelsa*), False Sandalwood, Myrtle Tree (*Canthium oleifolium*) and Supplejack (*Ventilago viminalis*), with a median height range of 5-8 m.

A mid-dense shrub layer always occurred and was comprised of Leichardt Bean, Curracabah Wattle, Wax Flower (*Philotheca difformis*), Wilga, Cocaine Bush, Black Wattle (*Acacia leiocalyx*), Quinine Tree, False Sandalwood, White Cypress Pine, Sandalwood (*Santalum lanceolatum*), Kurrajong (*Brachychiton populneus*), Gidgee, *Acacia debilis* and Peach Bush (*Ehretia membranifolia*).

A secondary very low shrub layer also typically occurred and included Currant Bush, Curracabah Wattle, Dysentery Plant and Wild Orange (*Capparis canescens*).

Ground cover was sparse and dominated by tussock grasses and annual herbs including Kangaroo Grass (*Themeda triandra*), Hairy Panic, Black Speargrass (*Heteropogon contortus*), Dark Wiregrass, Many-headed Wiregrass (*Aristida caput-medusae*), Leafy Nineawn (*Enneapogon polyphyllus*), Native Millett, High Sida and Pin Sida.

Non-native plant cover ranged from 5% to 70% and included Common Pest Pear, Buffel Grass, Shrubby Stylo (*Stylosanthes scabra*) and Guinea Grass (*Megathyrsus maximus*). The vegetation community was subject to varying degrees of disturbance from cattle.



Plate 3. Remnant Poplar Box woodland

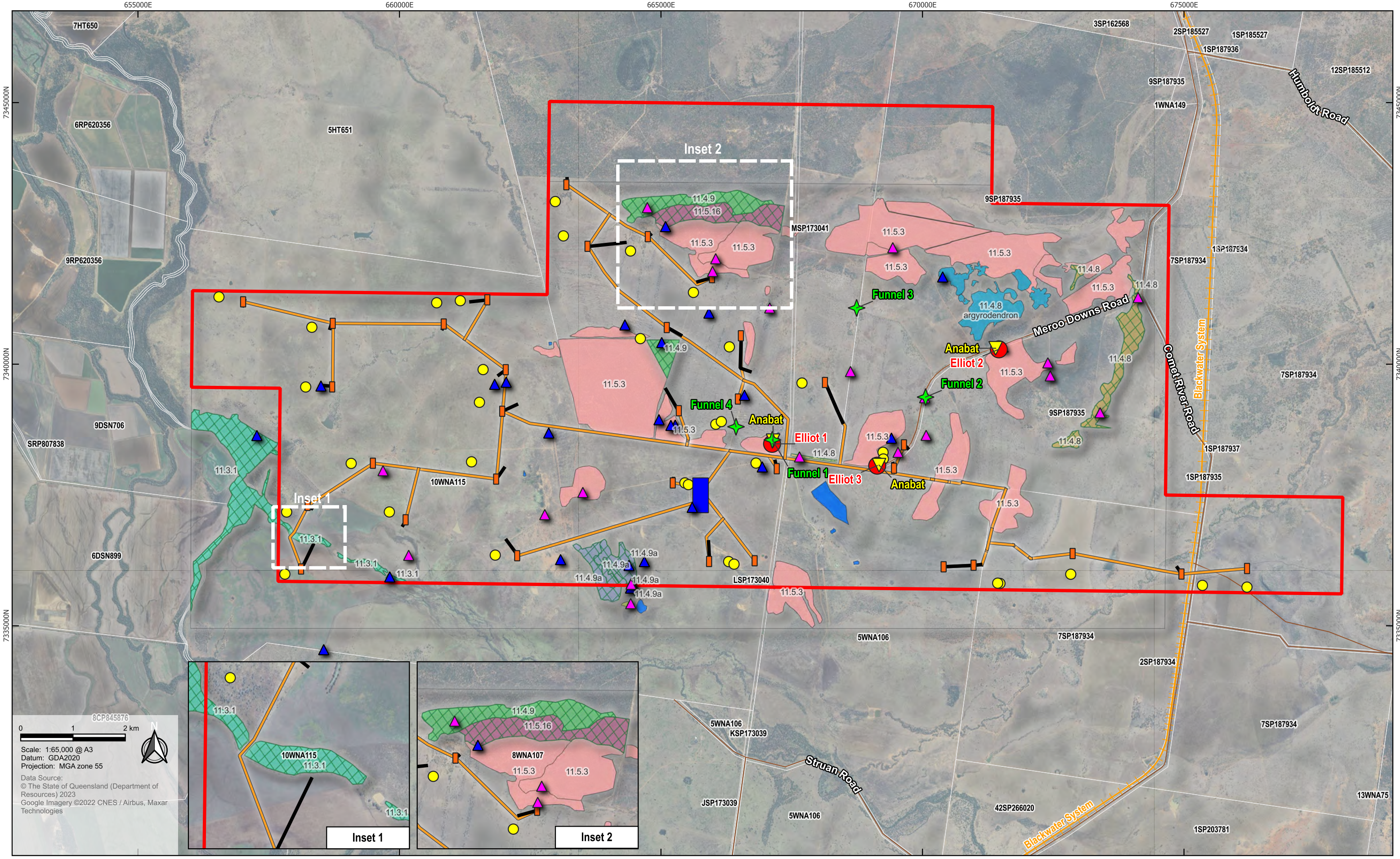
6.1.2.4 Regrowth Poplar Box Woodland

This regrowth vegetation community occurs on old loamy sandy plains in an open-woodland state (refer **Plate 4**). The community is dominated by Polar Box (*Eucalyptus populnea*) with associated Silver-leaved Ironbark and Dawson Gum with a median height range of 9-15 m and a canopy cover of 5%. A low and sparse sub-canopy was comprised of Quinine Tree, Red Ash and False Sandalwood with a median height of 5 m. A sparse shrub layer was comprised of Curracabah Wattle, Quinine Tree, Wilga, Cocaine Bush and Myrtle Tree with a median height range of 1-2.5 m.

Ground cover was sparse and dominated by tussock grasses and annual herbs including Black Speargrass, Golden Beard Grass (*Chrysopogon pallidus*), Native Millett, Hairy Panic, Comet Gras (*Perotis rara*), Bottlewashers (*Enneapogon avenaceus*), High Sida, Pin Sida and Flaxweed (*Pimelea trichostachya*). Non-native plant cover was low at 0-5% and included Buffel Grass and Shrubby Stylo. The vegetation community was subject to disturbance from historical vegetation clearing and tree thinning, particularly the selective removal of Poplar Box trees.



Plate 4. Regrowth Poplar Box woodland



Scale: 1:65,000 @ A3
 Datum: GDA2020
 Projection: MGA zone 55
 Data Source:
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Legend		Threatened ecological community		Survey sites	
Petroleum Lease Boundary	Gas compression facility	Brigalow	Quaternary	Funnel	
Cadastre (DCDB)	New access tracks	Ground-truthed Regional Ecosystems	Secondary		
Roads and tracks	Indicative gathering lines	11.3.1 Brigalow	Anabat		
Railways	Indicative lateral well	11.4.8 argyrodendron	Elliot		
	Indicative vertical well	11.4.8 Brigalow			
		11.4.9 Brigalow			
		11.5.3			
		11.5.16 Brigalow			
		Non-remnant water			



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 Figure 8
 Ground-truthed Regional Ecosystems and survey sites

6.1.3 Threatened Ecological Communities

A single TEC, Brigalow (*Acacia harpophylla* dominant or co-dominant) was identified within the Study area. The TEC is listed as Endangered under the EPBC Act. Two vegetation communities, remnant Brigalow woodland and regrowth Brigalow woodland are considered analogous to Brigalow TEC and are comprised of the following remnant and regrowth REs:

- RE 11.3.1
- RE 11.4.8
- RE 11.4.9
- RE 11.4.9a
- RE 11.5.16

Following ground-truthing of vegetation communities and analysis of aerial imagery the extent of Brigalow TEC within the Study area is estimated to be 347.24 ha and the extent illustrated in **Figure 8**.

6.1.4 Conservation Significant Flora Species

The likelihood of occurrence assessment for conservation significant flora species identified in database searches determined that a single species, *Solanum elaeagnifolium*, is known to occur within the Study area (based on records associated with works carried out by EMM 2022). A single flora species is likely to occur within the Study area (refer **Table 8**):

- Annual wiregrass (*Aristida annua*)

One further flora species is considered a possible occurrence within the Study area:

- Ooline (*Cadellia pentastylis*)

The remaining threatened flora species are considered unlikely to occur within the Study area and are not considered further in this report.

Table 8. Likelihood of occurrence assessment of conservation significant flora species

Species	Habitat and distribution	Likelihood of occurrence
<i>Cerbera dumicola</i> NC Act: NT	The species occurs across a range of habitats in central and southern Queensland. Associated vegetation and species include open woodland on sandstone hills and plateaus, semi-deciduous notophyll-microphyll vine forest on rhyolite hillslopes and woodland of <i>A. rhodoxylon</i> on brown, sandy loam (DES 2023a). The species is distributed from Barakula State Forest in the south to Charters Towers in the north (ALA 2023).	Unlikely. Suitable habitat for the species does not occur within the Study area. The species was not observed during project field surveys. The nearest historical record of the species is located 14 km to the north-east (ALA 2023).
<i>Leichhardtia brevifolia</i> EPBC Act: V NC Act: V	The species is known to occur in woodlands on serpentine rock outcrops and serpentine derived soils. The species is distributed across northern and central Queensland in areas of suitable habitat (DEWHA 2008a).	Unlikely. Suitable habitat for the species does not occur within the Study area. The species was not observed during project field surveys. The nearest historical record of the species is located 37 km to the south-west (ALA 2023).
Ooline (<i>Cadellia pentastylis</i>) EPBC Act: V NC Act: V	This species occurs on the western edge of the New South Wales (NSW) north-west slopes, from Mt Black Jack near Gunnadah to west of Tenterfield, and extends into Queensland to Carnarvon Range and Callide Valley, south-west of Rockhampton (DEWHA 2008b). This species grows in semi-evergreen vine thickets, Brigalow woodland and Poplar box woodlands on undulating terrain of various geology, including sandstone, conglomerate and claystone (DEWHA 2008b).	Possible. Suitable habitat for the species occurs throughout the Study area in the form of Brigalow and Poplar box dominated woodland vegetation, although the species was not observed during project field surveys. The nearest historical record of the species is located 23 km to the north-east (ALA 2023).
<i>Bertya opponens</i> EPBC Act: V NC Act: LC	Suitable habitat for the species includes shrublands, mallee, open-forest and woodland and semi-evergreen vine-thicket on shallow sandy or stony soils (TSSC 2016).	Unlikely. Suitable habitat for the species does not occur within the Study area. The dominant soils in the Study area are cracking clays. The species was not observed during project field surveys. The nearest historical record of the species is located 14 km to the north-east (ALA 2023).
Annual Wiregrass (<i>Aristida annua</i>) EPBC Act: V NC Act: V	This species is known to occur in eucalypt woodlands on black clay and basalt soils. This species is restricted to central Queensland in the Emerald and Springsure districts (DE 2014a).	Likely. Suitable habitat for the species occurs through the Study area. The species was not observed during project field surveys although the species is a rare annual. The nearest historical record for the species is located 6.5 km to the north (ALA 2023).
King Blue-grass (<i>Dichanthium queenslandicum</i>) EPBC Act: E NC Act: V	Suitable habitat for the species primarily includes black cracking clay soils supporting tussock grasslands in association with other species of blue grasses (<i>Dichanthium</i> spp. and <i>Bothriochloa</i> spp.) (DES 2022b). Other habitat types includes eucalypt woodland with <i>Corymbia dallachiana</i> , <i>Corymbia erythrophloia</i> or <i>Eucalyptus orgadophila</i> . The species is distributed from near Dalby north to about 90 km north of Hughenden and west as far as Clermont.	Unlikely. Suitable habitat for the species does not occur within the Study area. Grasslands within the Study area are non-native, dominated by invasive pasture grasses and subject to heavy grazing pressure. The species was not observed during project field surveys. The nearest historical record for the species is located 14 km to the north (ALA 2023).

Species	Habitat and distribution	Likelihood of occurrence
<p><i>Dichanthium setosum</i> EPBC Act: V NC Act: LC</p>	<p>Suitable habitat for the species includes open grassy woodland, grassland, cleared woodland and disturbed pastures on basaltic black soils and red-brown loams with clay subsoil (DEWHA 2008c). This species occurs in inland NSW and Queensland, as well as in Western Australia and Tasmania. In Queensland, it has been reported from the Leichhardt, Morton, North Kennedy and Port Curtis regions, and in the Mistake Range, in Main Range National Park, and possibly on Glen Rock Regional Park, adjacent to the national park (DEWHA 2008c).</p>	<p>Unlikely. The species was not observed during project field surveys. The nearest historical record for the species is located 35 km to the south-west (ALA 2023). The Project area is heavily disturbed and does not comprise the soils the species is usually associated with. Suitable habitat for the species occurs adjacent to but outside the Study area in the form of regrowth woodland on basalt-derived soils (RE 11.8.4). Woodland and cleared pasture areas within the Study area supported by Tertiary-early Quaternary clay deposits and loamy and sandy plains do not provide suitable habitat for the species.</p>
<p><i>Solanum dissectum</i> EPBC Act: E NC Act: E</p>	<p>Suitable habitat for the species includes Brigalow open forest or woodland, and <i>Eucalyptus thozetiana</i> woodland on solodic clay soils (DES 2022c)</p>	<p>Unlikely. Suitable habitat for the species does not occur within the site. The species was not observed during project field surveys. The nearest historical record of the species is located 11 km to the north-east (ALA 2023).</p>
<p><i>Solanum elachophyllum</i> NC Act: E</p>	<p>The species is not to occur in open forest dominated by Brigalow and <i>Eucalyptus thozetiana</i> on fertile cracking clay soils. The species is restricted to central Queensland between Middlemount and Theodore (DES 2022d).</p>	<p>Known. Suitable habitat for the species occurs through the Study area. A total of 256 individuals of the species were identified across five locations within the eastern portion of the Study area during 2019 (EMM 2022). The species was recorded in association with Brigalow (RE 11.4.8). The nearest historical record for the species is located 2 km to the east (ALA 2023).</p>

6.1.5 Weed Species

A total of 14 non-native weed species were identified within the Study area including a six invasive pasture grasses with Buffel Grass (*Cenchrus ciliaris*) being the most abundant and comprising between 5 % and 30 % of ground cover in wooded areas. Buffel grass has infested cleared areas and also invaded woodland vegetation including Brigalow. Parthenium (*Parthenium hysterophorus*) was also dense in cleared areas, particularly sites with clay soils and with greater soil moisture. Prickly Pear (*Opuntia stricta*) was scattered in low density across the Study area. Non-native flora species identified within the Study area, their Biosecurity listings and Weeds of National Significance (WoNS) status are provided in **Table 9**.

Table 9. Non-native flora species identified within the Study area

Common name (Species name)	Biosecurity Act category	WoNS
African Lovegrass (<i>Eragrostis curvula</i>)	-	-
Black Pigweed (<i>Trianthema portulacastrum</i>)	-	-
Buffel Grass (<i>Cenchrus ciliaris</i>)	-	-
Flannel Weed (<i>Sida cordifolia</i>)	-	-
Guinea Grass (<i>Megathyrsus maximus</i>)	-	-
Harrisia Cactus (<i>Harrisia martinii</i>)	3	-
Parthenium (<i>Parthenium hysterophorus</i>)	3	Yes
Prickly Pear (<i>Opuntia stricta</i>)	3	Yes
Purple Pigeon Grass (<i>Setaria incrassata</i>)	-	-
Red Natal Grass (<i>Melenis repens</i>)	-	-
Rhodes Grass (<i>Chloris gayana</i>)	-	-
Sabi Grass (<i>Urochloa mosambicensis</i>)	-	-
Shrubby Stylo (<i>Stylosanthes scabra</i>)	-	-
Siratro (<i>Macroptilium atropurpureum</i>)	-	-

6.2 Fauna Survey Results

The April 2022 and February 2023 surveys recorded a total of 138 fauna species including 10 frogs, 18 reptiles, 91 bird and 19 mammal species within and in the immediate surrounds of the area. This includes at least 11 microbat species recorded via Anabat monitoring. The fauna comprised a range of mostly widespread and common fauna species known from the region. A complete list of the observed fauna species is provided in **Appendix C**.

6.2.1 Observed Fauna

6.2.1.1 Herpetofauna

Frogs in particular were commonly observed during the 2023 survey during spotlighting and funnel trapping activities (both targeting waterholes). Of the 10 species identified eight were caught in funnel traps. Common species included Green-striped Frog (*Cyclorana alboguttata*), Salmon-striped Frog (*Limnodynastes salmini*) and Northern Banjo Frog (*Limnodynastes terraereginae*) (refer **Plate 5**). The introduced Cane Toad (*Rhinella marina*) was commonly observed throughout during spotlighting.

Reptiles were generally less conspicuous due to the heavy ground cover and the targeted nature of the funnel trapping activity. As such, no species were commonly recorded. Nevertheless, 18 species were identified across both surveys including two geckos, eight skinks, two dragons (refer **Plate 6**) and six snake species.

Ideal conditions were encountered during the 2023 survey for detecting Ornamental Snake. Conditions were hot and humid, patchy rain occurred in the area and prey species (frogs) were commonly observed and trapped. Four traps sites were established next to standing water in gilgais (refer **Figure 8** for locations and **Appendix C** for location data). The species was not recorded within the Study area or driving to and from the Study area during either the 2022 or 2023 surveys.



Plate 5. Northern Banjo Frog (February 2023)



Plate 6. Bearded Dragon (February 2023)

6.2.1.2 Birds

Sixty-eight bird species were recorded in April 2022 and 78 species recorded in January-February 2023. Of the overall total of 91 species recorded 82 of these were identified on Togara and 59 species on Meroo Downs. This reflects both the highly modified habitat present, and a resulting lesser survey focus on that property. Timbered areas provided habitat for a range of species common to the region including Peaceful Dove (*Geopelia striata*), Striped Honeyeater (*Plectorhyncha lanceolata*), Grey-crowned Babbler (*Pomatostomus temporalis*) and Pied Butcherbird (*Cracticus nigrogularis*). The abundant grasslands present provide habitat for a range of species associated with open habitats including Horsfield's Bushlark (*Mirafra javanica*), Rufous Songlark (*Megalurus mathewsi*), Brown Falcon (*Falco berigora*), finch species and Black-faced Woodswallow (*Artamus cinereus*). Nocturnal birds were observed to be common during both surveys and in particular during the 2023 survey. This was likely influenced by the good growing conditions at the time contributing to prey abundance.

6.2.1.3 Mammals

Native mammal species were dominated by microbats (11 species) as recorded by echolocation recordings. In general mammals were only sparingly observed which may reflect the heavy grass cover and limited availability of habitats able to be surveyed, particularly for spotlighting activity. The only macropod observed onsite was scattered individuals of Eastern Grey Kangaroo (*Macropus giganteus*). Short-beaked Echidna (*Tachyglossus aculeatus*) was observed on a single occasion. Rufous Bettong (*Aepyprymnus rufescens*) was recorded off-site although tracks likely to be of the species were recorded within the Study area. No arboreal mammals were observed.

6.2.2 Fauna Habitat Values

In general, faunal habitat quality at the time of the January 2023 survey was in relatively good condition due to recent rainfall. Grass coverage was dense across much of the Study area. Shallow water-filled waterholes were scattered across Togara and frog activity was high. Nevertheless, the fauna habitat values present are limited by the extent of vegetation clearing and blade ploughing for cattle grazing purposes. The following sections describe the habitat values observed within the Study area.

6.2.2.1 Eucalypt Woodlands

Dry woodland communities dominate the tracts of vegetation remaining in the Study area. These largely occur on the Togara property excepting a single stand of disturbed woodland near the homestead and a narrow riparian corridor (also highly disturbed) along Humboldt Creek on Meroo Downs. Throughout much of the Study area these communities appear to have been impacted by past tree clearing or tree thinning with few

large canopy trees present (**Plate 7**). More contiguous tracts of vegetation in the north-east of the Study area remain in better condition. Dominant canopy species throughout include Poplar Box, Silver-leaved Ironbark (*E. melanophloia*), Dawson Gum (*E. cambageana*) and Long-fruited Bloodwood. There is a distinct lower storey often dominated by White Cypress Pine, Wilga (*Geijera parviflora*), Acacia species and immature canopy trees. Buloke (*Allocasuarina luehmannii*) occurs in the north of the Study area. As noted above, the shrub layer was variable in extent and the ground layer was often dense due to the wet summer conditions experienced in the region prior to the February 2023 survey.

Past tree clearing activities have limited the availability of some habitat features useful to fauna. Large tree hollows provide shelter/nest sites for a range of arboreal fauna (such as large gliders, possums, owls and parrots) but were uncommon throughout due to the lack of old growth trees. Similarly, large woody debris, which provides shelter for a range of ground dwelling fauna species was generally sparsely distributed.

Nevertheless, these woodland habitats provide seasonal food resources for nectivorous bird species (honeyeaters and lorikeets), year-round prey resources for smaller insectivorous bird species and microbats, and small tree hollows suitable as shelter sites for microbats and small gliders. Koala is known to utilise the leaves of a variety of eucalypt species for foraging. It is noted no arboreal mammal species were recorded during spotlighting surveys. In general, the bird assemblage recorded during the site surveys was restricted to widespread and commonly occurring species.



Plate 7. Disturbed Poplar Box woodland – southern portion of Togara (February 2023)



Plate 8. Disturbed Brigalow woodland - Togara (April 2022)

6.2.2.2 Acacia Woodlands to Open Forest

There are stands of open forest/woodland dominated by a continuous canopy of Brigalow (refer **Plate 8**) or Blackwood scattered within Togara property, as well as a single patch of Brigalow with a vine-thicket understorey located in the south of the Study area on Meroo Downs. Brigalow has been extensively cleared across much of the Study area. These patches are often disturbed with an uneven canopy (but provide suitable foraging values for a variety of smaller forest bird species (e.g. Weebill (*Smicronis brevirostris*), Rufous Whistler (*Pachycephala rufiventris*) and fairywrens) that prefer a more closed canopy and dense low vegetation. There is abundant shelter for small ground fauna (particularly reptiles) in the form of low shrubs and fallen timber. Gilgais occur in some stands of remaining Brigalow in the south of Togara. Following heavy rainfall gilgais may provide habitat for frogs and associated predators such as snakes, herons and egrets.

6.2.2.3 Non-remnant Grasslands

Non-remnant grasslands dominate much of the Study area including much of the southern portion of Togara and almost all of Meroo Downs. In general, the grasslands provide limited structural and floristic diversity, and thereby limited faunal diversity in comparison to forested habitats.

The Togara property has been subject to blade ploughing (anecdotally) (refer although appears much less intensive than occurs on Meroo Downs. As such there is substantially more micro-landform variation and

gilgais occur. These generally occur as sparsely scattered, wide and shallow (<50 cm deep) depressions (refer **Plate 9**)



Plate 9. Blade plough areas (April 2022)

Scattered gilgaied areas comprising standing water were found to be common during the February 2023 survey (refer **Plate 10**). Nevertheless, there are lesser areas of more frequent deeper gilgais. The grasslands on Togara are still dominated by Buffel Grass but there is more diversity of native species present, often associated with the gilgai depressions. Brigalow occurs as sparsely scattered regrowth in areas not subject to recent ploughing. This habitat was targeted during the February 2023 survey due to the potential presence of Ornamental Snake (as associated with gilgaied areas). A variety of frog species were common in the vicinity of water-filled gilgai depressions which provides forage value for some predator species such as snakes, herons and egrets. Waterholes provide temporary watering points for a variety of other fauna. Otherwise, the limited structure of grasslands provide habitat for species that depend on grasslands and open habitats for foraging such as Eastern Grey Kangaroo (*Macropus giganteus*), finches, Horsfield's Bushlark (*Mirafra javanica*), Rufous Songlark (*Megalurus mathewsi*) and Jacky Winter (*Microeca fascinans*).

The Meroo Downs property has been subject to intensive blade ploughing to encourage pasture grass growth for cattle grazing. In the south-west of the Study area paddocks adjacent to Humboldt Creek are subject to cropping activity. As a result there is little habitat variation across the entire property with few stands of large trees and no observed evidence of gilgai formations. Buffel Grass is dominant with scattered individuals or patches of low regrowth trees occurring, often dominated by *Acacia crassa* (refer **Plate 11**). Given the poor structural diversity present the grassland habitat on Meroo Downs provides very limited value for fauna being largely restricted to grassland bird species such as Horsfield's Bushlark, Australian Pipit (*Anthus australis*) and Golden-headed Cisticola (*Cisticola exilis*) as well as other widely occurring species of open country.



**Plate 10. Water-filled gilgai on Togara
(February 2023)**



**Plate 11. Non-remnant grassland on Meroo Downs
(February 2023)**

6.2.3 Conservation Significant Fauna

No conservation significant fauna listed as threatened or migratory were recorded during the 2022 or 2023 survey. A single species listed as SLC under the NC Act was recorded: Short-beaked Echidna.

A detailed assessment of the likelihood of occurrence within the Study area of conservation significant fauna species identified during the desktop review is provided in **Table 10**. Of the conservation significant fauna species identified in the desktop review, one species is known to occur (Short-beaked Echidna) and two species are considered likely to occur (Ornamental Snake and Koala). A further five species are considered as potentially occurring. A further six species listed as Migratory under the EPBC Act may also possibly occur based on the habitat values present within the Study area.

Table 10. Likelihood of occurrence assessment of conservation significant fauna species

Species	Data source	Ecology and distribution	Likelihood of occurrence
Threatened Species			
Red Goshawk (<i>Erythrotriorchis radiatus</i>) EPBC Act: V NC Act: E	PMR	Endemic to northern and eastern Australia in coastal and subcoastal areas with large home ranges of up to 200 km ² . Occurs where there are extensive tracts of woodlands and forests and prefers mosaic habitats that hold a large population of birds and permanent water. Riparian areas are heavily favoured (Marchant & Higgins 1993). In partly cleared habitats in eastern Australia it occurs in areas with gorges and escarpments (Garnett et al. 2011).	Unlikely. The nearest records are several from 1996-1998 located in Blackdown Tablelands National Park (41-51 km north-east of the Study area. There are scattered records in the wider region surrounding the Study area but all are older (pre 1981) (ALA 2023). The wider landscape associated with Study area is mostly cleared. There is no suitable habitat present for the species.
Australian Painted Snipe (<i>Rostratula australis</i>) EPBC Act: E NC Act: E	PMR	Breeding only occurs in swamps with temporary water regimes and complex shorelines forming islands, shallow water, exposed wet mud and dense low fringing vegetation (Rogers et al. 2005; Geering et al. 2007). In non-breeding periods the species may be found in dams, waterlogged grasslands and roadside drains (Marchant & Higgins 1993). The only wetland habitat present in the Project area are two farm dams with no vegetative cover present.	Possible. The two closest known records are both undated <i>Birdlife Australia</i> records (ALA 2023). The records are 38 km and 47 km west of the Study area. There are no other records within 60 km of the Study area. The Study area comprises areas of gilgais which may provide transient habitat for the species following heavy rainfall periods. The species potential use of these sites would be temporary and very sporadic, if it occurs at all.
Curlew Sandpiper (<i>Calidris ferruginea</i>) EPBC Act: CE, M NC Act: CE	PMR	In Australia Curlew Sandpiper mostly occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays and lagoons. It also uses swamps, lakes, saltworks and sewage ponds. Less often it is recorded inland, around lakes, dams and bore drains, usually with bare edges of mud or sand (Higgins & Davies 1996).	Unlikely. The closest known record is from 1976 at Lake Maraboon, southwest of Emerald and approximately 65 km from the Project area. The species prefers large waterbodies with shallow muddy edges for foraging. The waterbodies in the Project area are relatively small farm dams and are not suitable for the species.
Squatter Pigeon (southern) (<i>Geophaps scripta scripta</i>) EPBC Act: V NC Act: V	PMR	The southern subspecies of the Squatter Pigeon occurs mainly in dry grassy eucalypt woodlands and open forests (Frith 1982; Crome & Shields 1992), also inhabiting Cypress Pine and acacia woodlands (Frith 1982). It mostly occurs on sandy sites near permanent water (Blakers et al. 1984), and particularly favours areas of sandy soil dissected by low gravelly ridges close to water (Frith 1982). Breeding habitat includes stony rises occurring on sandy or gravelly soils, within one km of a suitable, permanent waterbody (Squatter Pigeon Workshop 2011), and alluvial areas, which are also important habitat (Frith 1982).	Possible. Not observed during surveys for the Project and not recorded during surveys for other projects in the wider area (Golders 2019; EMM 2022). The two closest known records are both undated <i>Birdlife Australia</i> records (ALA 2023). The records are 15 km and 24 km north of the Study area. Both records have a high spatial uncertainty (9 km) placed on the record. There are scattered records of the species in all directions in the surrounding region. Much of the Study area comprises unsuitable clay soils. Nevertheless, the species may utilise the woodland areas with sandy soils (regrowth and remnant RE 11.5.3).

Species	Data source	Ecology and distribution	Likelihood of occurrence
Grey Falcon (<i>Falco hypoleucos</i>) EPBC Act: V NC Act: V	PMR	Species occurs in arid and semi-arid inland Australia where annual rainfall is less than 500 mm. Younger individuals may disperse outside of this habitat in drought years that follow wet years in inland Australia. Preferred habitat includes sparsely timbered lowland plains, particularly Acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Schoenjahr 2018; TSSC 2020).	Unlikely. There are sparse records scattered in the wider area surrounding the Study area the nearest of which is 41 km east of the Study area. All of these records are older (pre 1981). Mean rainfall in the Rolleston region is above 600 mm (BoM 2023). The Study area is located outside the core range of the species. There are no recent records close to the Study area and the habitat present is marginal at best. Occasional dispersing vagrant individuals may occur but the Study area is generally unsuitable for the species.
Painted Honeyeater (<i>Grantiella picta</i>) EPBC Act: V NC Act: V	PMR	Sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory (Garnett & Baker 2021). The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland (from approximately Roma south) (DCCEE 2023). The species forages on mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, Acacia dominated woodlands, paperbarks, <i>Casuarinas</i> , <i>Callitris</i> , and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes (DE 2015).	Possible. The nearest records of the species are from 1985 and 2017 and located 38 km and 48 km north-east of the Study area. All other records are further west and south. The Study area is on the eastern edge of the species range. Suitable non-breeding habitat for the species does occur within the site, particularly areas with Brigalow. However, mistletoes were observed to be generally rare across the Study area.
Star Finch (southern) (<i>Neochmia ruficauda ruficauda</i>) EPBC Act: E NC Act: E	PMR	Occurs in grasslands and grassy woodlands, near permanent water, and sometimes in or near cleared suburban areas. Also reported along river banks dominated by native grasses and sedges. Distribution is poorly known. The subpopulation is currently thought to be extinct (Garnett & Baker 2021).	Unlikely. There are sparsely scattered records in the wider region surrounding the Study area. The nearest of these is located 38 km north with an uncertain collection date (possibly 1986). There are no recent records of the subspecies and it likely no longer occurs at all.
Southern Black-throated Finch (<i>Poephila cincta cincta</i>) EPBC Act: E NC Act: E	PMR	The species prefers grassy, open woodlands and forests, dominated by <i>Eucalyptus</i> , <i>Corymbia</i> or <i>Melaleuca</i> . Tussocks grasslands and freshwater wetlands also provide occasional habitat. The species is typically observed in riparian habitats or near water. The subspecies is currently only locally common in Queensland at sites near Townsville and Charters Towers, with records scattered throughout the Brigalow Belt North and Desert Uplands bioregions (BTFRT 2007).	Unlikely. Database records in the wider region are all older records (pre-1976) and the species is very likely extinct in the region. The closest recent database records (2016) are from a known population associated with the Bravus coal mine and are over 290 km north-west of the Study area. Will not occur.

Species	Data source	Ecology and distribution	Likelihood of occurrence
<p>Diamond Firetail (<i>Stagonopleura guttata</i>) EPBC Act: V NC Act: V</p>	<p>PMR</p>	<p>Occurs in lightly timbered habitats with high grass coverage. May occur in farmlands with scattered trees. Once occurred as far north as Cardwell in Queensland but now only occurs in the far south of the state. Prefers areas with a low density of trees, little fallen timber and a heavy grass cover (DCCEEW 2023).</p>	<p>Unlikely. There are sparsely scattered records in the surrounding region (none within 38 km of the Study area) although all of these are older records (pre 1982). The only recent record is from 2020 and located over 140 km to the south in Expedition Range National Park. Even this record appears very isolated from other recent records which are much further south (ALA 2023). It is unlikely the remaining habitats in the Study area are suitable for the species and the species is very unlikely to currently occur in the region.</p>
<p>Short-beaked Echidna (<i>Tachyglossus aculeatus</i>) NC Act: SLC</p>		<p>The species is specialised for feeding on ants, termites and beetle larvae. It occurs in almost all terrestrial habitats except for highly modified areas and is active both by day and night. It shelters in logs, caves, crevices, burrows and leaf litter. The Short-beaked Echidna occurs throughout Australia and although it may be sparsely distributed in some areas, especially arid regions, it remains ubiquitous and common (Augee 2008; Menkhorst 2010).</p>	<p>Known. Individual observed within the Study area during the 2023 survey. Scats also observed in 2022. The species is widespread and can occur in both remnant and heavily disturbed habitats.</p>
<p>Northern Quoll (<i>Dasyurus hallucatus</i>) EPBC Act: E NC Act: LC</p>	<p>PMR</p>	<p>Northern Quoll is most common around rocky escarpments but is also found in eucalypt forest and woodland and around human settlements. It is now absent from much of its former range, and although it may be locally common the species is rapidly declining (Oakwood 2008). In Queensland the species is now only known from the most rugged and remote parts of its range, mostly along the ranges along the east coast (Burnett 2012), mostly confined to rocky outcrops that provide protection from Cats (<i>Felis catus</i>) and too-frequent fires (Baker & Dickman 2018). Its range is now highly fragmented (Woinarski et al. 2014) and may be as little as 10% of its potential range (Baker & Dickman 2018).</p>	<p>Unlikely. There are three records located 47 km west of the Study area (from 1967, 1975 and one undated) and a 1997 record located 41 km south (ALA 2023). The Study area is heavily disturbed and largely cleared of woody vegetation. There is no rocky shelter habitat present. Cane Toads were observed as abundant during surveys. The species is unlikely to occur.</p>

Species	Data source	Ecology and distribution	Likelihood of occurrence
<p>Greater Glider (<i>Petauroides volans</i>) EPBC Act: E NC Act: E</p>	<p>PMR</p>	<p>Greater Glider is found from the Windsor Tableland in north Queensland to central Victoria, occurring from sea level to 1200 m (Woinarski et al. 2014). The species lives in a variety of eucalypt-dominated forest and woodland. The species requires woodlands with large tree hollows for daytime shelter sites. The species is absent from regenerating forest lacking old trees with suitable hollows. Home ranges are about 1-4 ha in size in productive forests (Kehl & Borsboom 1984) and up to 16 ha in less productive areas. The species forages in a restricted range of tree species within its distribution. Eyre (2006) notes in drier inland forests in the region Greater Gliders preferred forests dominated by red gums (<i>E. camaldulensis</i> and <i>E. tereticornis</i>), grey gums (<i>E. longirostrata</i> and <i>E. biturbinata</i>), Lophostemon species and Spotted Gum.</p>	<p>Unlikely. Not observed during surveys for the Project and not recorded during surveys for other projects in the wider area (Golders 2019; EMM 2022). There are a large number of records to the north-east associated with the Blackdown Tablelands (at least 38 km from the Study area). The closest records are from along the Comet River in 1997 and are 24 km south of the Study area. There are several other records to the south and west including relatively recent records (2012 and 2016) near Springsure (48 km west) (ALA 2023). The Study area has been heavily impacted by vegetation clearing. The dominant eucalypt species present is Poplar Box which is not a preferred tree species based on a detailed analysis of species records (Eyre et al. 2022b). Riparian habitat along Humboldt Creek within the Study area is heavily degraded with few trees with large hollows. While the species may occur along the Comet River there is little suitable habitat present within the Study area.</p>
<p>Koala (<i>Phascolarctos cinereus</i>) EPBC Act: V NC Act: V</p>	<p>PMR WildNet</p>	<p>Associated with eucalypt woodland and forest habitats comprising suitable food trees, mainly of the following genus: <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Angophora</i> and <i>Melaleuca</i> (Moore & Foley, 2000; Martin et al. 2008). They are not necessarily restricted to bushland areas and are known to occur and breed where suitable tree species occur within farmland and the urban environment (Dique et al. 2004).</p>	<p>Likely. A large number of database records in the wider area including two records (1976 and 1996) within the Study area itself. Most records are older (pre1990). The nearest recent record is from 2012 and located 17 km south-east of the Study area. In recent surveys for other projects in the area Koalas were detected to the east of the site in riparian and Acacia woodlands (EMM 2022) and scats were detected along a creek line by Golder (2019). Within the Study area the most suitable habitat is along Humboldt Creek in the south-east.</p>
<p>Ghost Bat (<i>Macroderma gigas</i>) EPBC Act: V NC Act: E</p>	<p>PMR</p>	<p>The species occurs across a range of habitats, from arid Pilbara to tropical savanna woodlands and rainforests. During the daytime they roost in caves, rock crevices and old mines. Roost sites used permanently are generally deep natural caves or disused mines with a relatively stable temperature of 23°–28°C and a moderate to high relative humidity of 50–100 percent. The average foraging distance is approximately 2 km from the daytime roost (DCCEE 2023).</p>	<p>Unlikely. Suitable rocky roosting habitat for the species does not occur within or near the Study area. The nearest records of the species include a 1997 record 41 km south and 1985 record from the Blackdown Tableland (54 km north-east). No suitable habitat is present.</p>

Species	Data source	Ecology and distribution	Likelihood of occurrence
Corben's Long-eared Bat <i>Nyctophilus corbeni</i> EPBC Act: V NC Act: V	PMR	Surveys suggest the species requires large tracts of forest to occur (Turbill et al. 2008). It occurs in a range of woodlands but the preferred habitat is mallee and <i>Callitris</i> woodlands and habitats that have a distinct canopy with a dense, cluttered understorey (Pennay et al 2011; Turbill & Ellis 2006).	Unlikely. There is a 1998 record from Blackdown tableland 42 km to the east and an 1883 record 87 km east of the Study area. All other species records are at least 120 km south of the Study area. The Study area is located on the northern edge of the species potential distribution. The Study area has been heavily impacted by tree clearing and does not support the preferred habitats or large tracts of woodlands the species requires.
White-throated Snapping Turtle <i>(Elseya albagula)</i> EPBC Act: CE NC Act:	PMR	Found in the major drainage basins of the Fitzroy, Burnett and Mary rivers of south-east Queensland. There are also records from the Raglan, Kolan and Gregory-Burrum drainages (Thomson et al. 2006). The species is most commonly found in flowing water, with log tangles, undercut banks and irregular rocky substrate that act as shelter. It is rarely found in ephemeral waterbodies or in waterbodies away from flowing streams. It is generally scarce or absent in standing waterbodies created by dams or weirs (Hamann et al. 2007).	Known. The species was recorded in the Comet River to the east of the Study area in March 2023 during aquatic ecology surveys for the Project. There are no previous publicly available database records of the species occurring in the Comet River. Species records occur in the Mackenzie River downstream of the confluence with the Comet River. The only substantial creek associated with the Study area is Humboldt Creek which is ephemeral and appears highly unsuitable for the species occurrence.
Fitzroy River Turtle <i>(Rheodytes leukops)</i> EPBC Act: V NC Act: V	PMR	The Fitzroy River Turtle is limited to the Fitzroy River catchment in central Queensland (Gordos 2012). Known sites include Boolburra, Gainsford, Glenroy Crossing, Theodore, Baralba, the Mackenzie River, Connors River, Duaringa, Marlborough Creek and Gogango (DE 2020a). It occurs in fast-flowing clear rivers (Ehmann 1992). Core areas of activity are focused on riffle zones year-round. The species doesn't move far, even during flood events, and as base flows re-establish, individuals are found within a few hundred metres of riffles. If the riffle zone is seasonally ephemeral or dried completely, females retreat to deeper sections of pools (Tucker et al. 2001).	Unlikely. The species may occur in the Comet River to the west of the Study area although there are no publicly available database records of the species occurring. The only substantial creek associated with the Study area is Humboldt Creek which is ephemeral and appears highly unsuitable for the species occurrence.
Collared Delma <i>(Delma torquata)</i> EPBC Act: V NC Act: V	PMR	The species is typically associated with west-facing ridgelines with dry open sclerophyll and Acacia woodlands with an open midstorey and a ground cover of native grasses, thick leaf litter and abundant loose rocks (Peck 2012). Surface rocks are a significant habitat feature.	Unlikely. The nearest database record is from 1997 and located in the Blackdown tableland (53 km north-east). Soils in the area largely comprise cracking clays with areas of sandy soils. There are no raised rocky areas and no suitable habitat present.

Species	Data source	Ecology and distribution	Likelihood of occurrence
Yakka Skink (<i>Egernia rugosa</i>) EPBC Act: V NC Act: V	PMR	The species occurs in a wide variety of habitat types, particularly eucalypt/Acacia woodlands and open forests. Yakka skinks usually occur on well-drained, coarse, gritty soils in the vicinity of low ranges, foothills and undulating terrain (Ehmann 1992; Brigalow Belt Reptiles Workshop 2010) but are also found on loam and clay soils (Eddie 2012). The species lives in communal burrow systems, often under timber and in deep rock crevices (Ehmann 1992; Wilson 2015).	Unlikely. The nearest record is located 24 km to the west and is a Queensland Museum record with no collection date and a high spatial uncertainty (10 km). There is a 1976 record located 44 km north of the Study area. The Study area largely comprises cracking clay soils cleared of vegetation in flat undulating country. There are no rocky areas or ridgelines present. There is little suitable habitat for the species present.
Ornamental Snake (<i>Denisonia maculata</i>) EPBC Act: V NC Act: V	PMR	Largely restricted to low-lying areas with deep-cracking clay soils, which are subject to seasonal flooding, and adjacent areas of clay and sandy loams. Habitat includes woodland and shrubland, such as Brigalow, and riverine habitats, where the species lives in soil cracks and under fallen timber (Ehmann 1992; Wilson & Swan 2010). The species may be found in areas of simple habitat structure, such as paddocks, grasslands and regrowth if frogs are present (Melzer 2012).	Likely. Not recorded during surveys for the Project despite ideal conditions for detecting the species. Recorded during surveys for other projects in the wider area (Golders 2019; EMM 2022). All sightings were located west of the Comet-Rolleston Road despite targeted surveys for the species within the east of the current Study area (EMM 2022) and to the immediate south (Golders 2018). Two of these records are located within 3 km east of the Study area. There are areas of gilgai habitat on Togara property which may support the species. Potential habitat on Meroo Downs has been heavily impacted by blade ploughing and does not appear suitable. Cane Toads were noted as abundant during Project surveys.
Grey Snake (<i>Hemiaspis damelii</i>) EPBC Act: E NC Act: E	PMR	Occurs on floodplains (Ehmann 1992) and is often found in seasonally inundated areas, preferring cracking, flood-prone clay or loam soils and areas with gilgais. The preferred habitat for the species in southern Queensland is woodlands featuring Brigalow, <i>Casuarina cristata</i> and <i>Eucalyptus populnea</i> (Hobson 2012) on dark, cracking clay soils (Hobson 2012; DCCEE 2023). The species is often found in riverine habitats near watercourses, natural levees, gullies and ditches (Ehmann 1992; DCCEE 2023).	Possible. Not observed during surveys for the Project and not recorded during surveys for other projects in the wider area (Golders 2019; EMM 2022). The nearest record is from 2003 and located 39 km north of the Study area. Most other records are located much further south in southern Queensland. The Study area is on the north-west edge of its potential distribution. There is suitable gilgaied habitat present although records of the species in the region are scarce.
Migratory Bird Species			

Species	Data source	Ecology and distribution	Likelihood of occurrence
Glossy Ibis (<i>Plegadis falcinellus</i>)	WildNet	Glossy Ibis is considered migratory and nomadic (Marchant & Higgins 1990; Matheu & del Hoyo 1992) and is generally uncommon and erratic in occurrence (Pringle 1985). Glossy Ibis occurs in terrestrial wetlands, preferring inland freshwater wetlands with abundant aquatic flora (Pringle 1985; Marchant & Higgins 1990). Within Australia, the species moves in response to good rainfalls, expanding its range, however the core breeding areas used are within the Murray-Darling Basin region of New South Wales and Victoria, the Macquarie Marshes in New South Wales, and in southern Queensland. Breeding typically occurs in dense colonies, often with other waterbirds and occurs in response to flood events (Pringle 1985).	Possible. Single 2018 database record 19 km north of Project. Permanent wetlands in the Study area are restricted to farm dams. Observations at these sites indicated little aquatic vegetation present. There is a minor potential for the species to occur, although likely only in a transient manner.
Latham's Snipe (<i>Gallinago hardwickii</i>)	PMR	Occurs in a wide variety of permanent and ephemeral wetlands, preferring open freshwater wetlands with fringing vegetation. The species is also recorded from swamps, billabongs, lakes, edges of creeks and rivers, bogs, marshes behind coastal sand dunes and some artificial waterbodies. It will occur in any vegetation around wetlands, including grasslands, heath, woodland and forest (Higgins & Davies 1996).	Possible. No nearby records of the species. Permanent wetlands in the Study area are restricted to farm dams. Observations at these sites indicated little aquatic or fringing vegetation present at these sites. There is a minor potential for the species to occur, although likely only in a transient manner.
Common Sandpiper (<i>Actitis hypoleucos</i>)	PMR	Non-breeding spring/summer migrants to Australia, which are largely coastal in occurrence but may occur on inland wetlands, particularly during migration. Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. Pectoral Sandpiper mostly occurs on shallow fresh or saline wetlands where it forages in shallow water or soft mud at the edges. Common Sandpiper occurs mostly in the north and west. It prefers narrow and often steep shorelines, often away from other waders. It is most common along mangrove-lined creeks but will also use sewage ponds and dams (Higgins & Davies 1996; Menkhorst et al. 2017).	Possible – Sharp-tailed Sandpiper only, other species unlikely. The species has not been recorded during any Project surveys. There are database records for Sharp-tailed Sandpiper although none within 50 km of the Study area. There are no nearby records for Common Sandpiper and Pectoral Sandpiper largely occurs in near coastal areas. Sharp-tailed Sandpiper may occur occasionally around farm dams within the Study area. Mainly larger dams with shallow edges as occur in the south of the Study area.
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	PMR		
Pectoral Sandpiper (<i>Calidris melanotos</i>)	PMR		
Gull-billed Tern (<i>Gelochelidon nilotica</i>)	WildNet	Caspian Tern occurs mostly in sheltered coastal habitats, such as bays, estuaries, harbours and inlets, usually with sandy or muddy margins. Gull-billed Terns prefer shallow wetlands, particularly those with	Possible. Generally aquatic habitat within the Study area for these species is unsuitable (i.e. relatively small farm dams and ephemeral creek lines).

Species	Data source	Ecology and distribution	Likelihood of occurrence
Caspian Tern (<i>Sterna caspia</i>)	WildNet	mudflats including estuaries, river deltas, lakes, swamps and lagoons, including ephemeral waterbodies. Both use fresh and saline waterbodies and occur on inland wetlands, especially lakes, and reservoirs and rivers (Marchant & Higgins 1996).	Nevertheless, the two species may occasionally occur on larger dams in the south of the Study area on Meroo Downs and Struan properties.
Oriental Cuckoo (<i>Cuculus optatus</i>)	PMR	The species mostly occurs on the northern and eastern coasts of Australia, between September and April. Oriental Cuckoos occur in rainforest, vine thicket and open forest and woodland. The species is sometimes found in mangroves and is often recorded in gardens and plantations (Blakers et al. 1984; Higgins 1999).	Unlikely. Sparse records in the wider area although none within 45 km of the Study area. The species generally occurs in habitats closer to the coast. Habitat within the Study area has been heavily modified and generally is unsuitable for the species presence.
Fork-tailed Swift (<i>Apus pacificus</i>)	PMR	Fork-tailed Swift breeds in Asia and occur throughout Australia from September/October to April. The species is widespread in Australia (Higgins 1999). In Australia, Fork-tailed Swift is almost exclusively an aerial species, probably even sleeping on the wing, though individuals are occasionally recorded roosting in trees.	Possible. Sparse records in the wider area although none within 45 km of the Study area. Species occurs widely across Australia in the summer months and may occur over almost any habitat, including highly modified environments.
Satin Flycatcher (<i>Myiagra cyanoleuca</i>)	PMR	Satin Flycatcher inhabits east coast forests (Menkhorst et al. 2017), avoiding dry habitats and is virtually confined to the east of the Great Dividing Range (Boles 1988). During passage it may occur in coastal forests, woodlands, mangroves, gardens and trees in open country (Pizzey 1980). Satin Flycatcher is infrequently seen in central and northern Queensland, where it is mostly a passage migrant (Menkhorst et al. 2017).	Unlikely. Scattered records in the wider area although none within 40 km of the Study area. The veracity of records in inland Queensland may be questionable. The species is easily confused with the much more common Leaden Flycatcher (<i>Myiagra rubecula</i>). Habitat within the Study area has been heavily modified and generally is unsuitable for the species presence.
Yellow Wagtail (<i>Motacilla flava</i>)	PMR	Yellow Wagtail is a regular migrant to coastal Australia but in small numbers. Occurs in open areas with low vegetation, especially in cultivation and on lawns, sporting fields and airfields, as well as sewage farms and occasionally beaches (Higgins et al. 2006; Menkhorst et al. 2017).	Unlikely. There is no record of Yellow Wagtail within 280 km of the Project. The majority of records in Australia are coastal or near coastal.

6.2.4 Pest Species

Seven species of feral animal were recorded during the field surveys within the Study area (refer **Table 11**). Only Cane Toad was observed to be common (during spotlighting surveys). Common Myna was observed sporadically at several sites throughout the Study area. Of the species, four are listed under Schedule 2 of the Biosecurity Act as ‘Restricted Matters’.

Table 11. Pest species identified during the 2022/23 field surveys

Scientific name	Common name	Biosecurity Act categories
<i>Sus scrofa</i>	Pig	3,4,6
<i>Mus musculus</i>	House Mouse	-
<i>Acridotheres tristis</i>	Common Myna	-
<i>Rhinella marina</i>	Cane Toad	-
<i>Oryctolagus cuniculus</i>	Rabbit	3,4,5,6
<i>Canis lupus</i>	Common Dog/Dingo	3,4,6
<i>Felis catus</i>	Cat	3,4,6

7 POTENTIAL PROJECT IMPACTS AND MITIGATION MEASURES

The indicative Project footprint is shown in **Figure 8** overlaid on the field-verified vegetation mapping. For conservation significant species considered as potentially occurring, impacts were assessed for loss of habitat by the construction of Project infrastructure.

7.1 Potential Project Impacts

The Project activities have potential to directly and indirectly impact a range of ecological values, including vegetation communities and habitat for threatened flora and fauna. The majority of impacts are expected to occur during construction of Project infrastructure which comprises the following:

- CSG production well pads (34 lateral wells and 34 production well pads maximum disturbance area per well pad of 1 ha). Following construction 0.04 ha (20 m x 20 m) at each well will be retained for the operational phase and the remainder will be rehabilitated (based on the previous flora species/vegetation community present)
- New access tracks where required (disturbance width of 6 m on average within the gas gathering line disturbance area)
- Gathering flow line disturbance area for gas (disturbance width of 18 m excepting intersection of habitat for threatened fauna where reduced to width of 6 m)
- One temporary construction camp requiring 1 ha located in previously cleared grazing lands that are not located in areas mapped as suitable habitat for Ornamental Snake, to be located near site construction works
- Gas compression facility (disturbance area of 20 ha) including:
 - CSG processing and water management/storage infrastructure
 - Site offices
 - One permanent operational camp
 - Other ancillary infrastructure (e.g. storage buildings)

The current proposed layout of the Project is depicted on the ground-truthed vegetation mapping for the Study area in **Figure 8**. The design of the Project will be subject to further refinement as the design phase progresses.

7.1.1 Clearing Vegetation

The clearing of vegetation is the most significant and direct impact of the Project on ecological values of the Project area. Land clearance is listed as a key threatening process under the EPBC Act. The removal of habitat reduces the size of local populations of flora and fauna dependent on that habitat. These impacts are immediate and significant in the short-term. Impacts may persist in the long-term if habitat created during rehabilitation does not closely resemble pre-disturbance ecosystems. In addition, if sufficient habitat refuges are not maintained locally, prior to the maturation of rehabilitated land, local extinction of certain species may occur.

The layout of the Project gas field infrastructure currently encompasses a total of 178.27 ha. Given the heavily modified landscape present, Project infrastructure has been located away from sensitive ecological values as much as is feasible. The disturbance footprint has been subject to several revisions in order to further avoid identified higher values habitats.

The predicted extent of overall impact to vegetation communities and habitat for threatened species (including MNES) is provided in **Table 12**. The extent of impact is based on the results of the ground-truthed vegetation mapping (where surveys could be carried out), analysis of aerial imagery (elsewhere in the Study area) and onsite habitat assessments (particularly with regard to Ornamental Snake). The Project is predicted to impact a maximum of 1.17 ha of remnant vegetation under the current layout. An additional potential impact to threatened fauna species is on gilgai habitat considered suitable for Ornamental Snake which does not require the presence of overhead woody vegetation (i.e. the species can occur in non-remnant areas). Grey Snake and Australian Painted Snipe may also utilise this habitat.

Table 12. Predicted vegetation clearing for Project gas field infrastructure based on current layout

RE	Biodiversity (EP Act) status	Potential MNES habitat	Proposed impact area (ha)
11.5.3	No concern	Koala, Squatter Pigeon, Ooline	1.17
Non-remnant (gilgais present)	-	Ornamental Snake, Grey Snake, Australian Painted Snipe	0.89
Non-remnant (other)	-	N/A	176.21
Overall area			178.27

7.1.2 Habitat Fragmentation, Connectivity and Edge Effects

Highly fragmented habitats support fewer species than connected blocks of habitat of the same size. This is because fragmentation restricts dispersal of fauna and plant seeds between available habitat. The impacts of habitat fragmentation depend on the degree to which dispersal is inhibited by habitat gaps, the size of the remaining habitat fragments, and ecological attributes of the species.

The landscape associated with the Project has been heavily impacted by tree clearing for cattle grazing purposes. The Project infrastructure has been situated in areas already cleared of vegetation wherever possible. There will be very little clearing of remnant vegetation required. The majority of infrastructure will be underground following completion of construction. There will be no impact to landscape connectivity and habitat fragmentation as a result of the Project.

The habitats that remain extant in the Project area are likely already subject to the potential for edge effects caused by increased exposure (along the edges of remaining patches) to wind and sun as well as increased weed invasion risk. Fauna species of more open habitats may displace woodland species as patches decline in size. Many patches within the Project are of a size or shape (thin remnants) as to be considered all edge. Regardless, the Project is proposing to clear a very minor extent of wooded habitat and is considered to have a negligible impact on increasing the impact of edge effects within the Project area.

7.1.3 Fauna Mortality

Clearing of vegetation for the Project presents a risk of direct mortality or injury to fauna. Fauna of low mobility are at risk of injury or death from heavy machinery and vehicular movements during the construction of the Project and to a lesser extent during operations. Additional impacts include the trapping of fauna in trenches during installation of gas pipelines. The operational phase is unlikely to add to this impact due to the small scale of Project operations.

Clearing will only occur within designated areas and only during designated time periods. The presence of qualified Wildlife Spotter-Catcher/s to assist with initial clearing and daily checking of trenches will decrease incidences of fauna mortality. Educating employees and contractors with regard to fauna and flora will further reduce direct mortality as part of the Project.

7.1.4 Airborne Dust

Earthworks and vehicular traffic associated with Project construction and operation can generate substantial amounts of dust during dry weather (Field et al. 2010). Dust can have both a physical and chemical impact on plants, either through the smothering of leaves, whereupon the rate of deposition is important, or through chemical changes to the soil or directly to the plant surface. Changes in soil properties, such as pH, can ultimately impact plant species assemblages. Dust can form a hard crust on the leaf surface, increasing leaf temperature and increasing susceptibility to drought. Dust can have adverse impacts on plant photosynthesis, respiration, transpiration and productivity (Farmer 1993; Chaston & Doley 2006). Evidence of potential impacts on entire vegetation communities is scarce. Many studies focus on specific impacts to single species and findings may not be conclusive.

The pronounced wet and dry seasons associated with the Project area (inland southern Brigalow Belt) may make vegetation in these areas less susceptible to the impacts of dust. In general, the construction disturbance will take place well away from extant woody vegetation communities.

7.1.5 Noise and Lighting

Understanding of the impacts of noise on fauna is limited. There are no current government policies or guidelines that recommend noise thresholds or limits for development activities to mitigate potential harm to fauna. Noise may affect wildlife through a variety of impacts such as: interfering with communication calls; interfering with foraging/defence through cloaking the sound of predators and prey; causing general stress or avoidance reactions; or changes in reproductive or nesting behaviours. Excessive noise may lead some species to avoid noisy areas, which could result in the localised fragmentation of habitat at the species or individual territory level. Radle (2007) states the consensus that terrestrial fauna will avoid any industrial plant or construction area where noise or vibration presents an annoyance to them. Nevertheless, many animals may interpret a new noise as a potential danger at first, but rapidly understand the noise is not associated with any threats (Radle 2007).

Artificial lighting may have a range of impacts across different groups of taxa and between species within these groups. Some taxa such as rodents may avoid brightly lit areas at night. Alternatively, nocturnal fauna such as many microbat species, frogs and some reptiles may congregate at artificial lights to feed on insects attracted to light (Perry et al. 2008; Rich & Longcore 2006). Although, other microbat species may avoid well-lit areas (Threlfall et al. 2013). Artificial light can alter foraging and calling by frogs and probably impairs their vision (Buchanan 1993) and may lead to individuals being killed by vehicles when attracted to lights for feeding on invertebrates.

Noise impacts from the Project to surrounding fauna habitat will largely be restricted to that emitted during construction activities. The gas compression facility is likely to be the only substantial source of noise and lighting impacts during operations. The facility is located in cleared habitat on Meroo Downs with relatively poor habitat for fauna present. Post-construction it is expected that any resident fauna will become accustomed to the ongoing noise generated by the facility. The CSG production wells will be powered by a generator and is expected to emit low level noise that is not expected to impact fauna. Similarly, lighting at well sites will be unnecessary, or restricted to low levels that will not be an impact on fauna.

7.1.6 Weed and Pest Animals

Introduced weeds have the potential to impact on terrestrial and aquatic ecological values as native flora can become displaced through competition with weed species, and adversely affected by browsing and soil trampling caused by feral herbivores. Native fauna populations, particularly small to medium sized species, may be impacted by predation from introduced carnivores such as feral cats and Red Fox. These are indirect impacts which may not manifest themselves in the short-term and are likely to be exacerbated by existing cattle grazing activities on the Project lands. Introduced weed species are already present throughout the Study area which is dominated by Buffel Grass in the ground layer throughout. Parthenium was observed to be common, particularly in the non-remnant grassland areas and is listed as a WoNS and under the State's Biosecurity Act.

The following activities associated with the Project have the potential to promote the proliferation of weeds and pests within the Study area, or introduce new weeds and pests from surrounding areas:

- The use of construction machinery, plant and materials sourced from outside the region and increased vehicular traffic in general may introduce and spread weed seeds if biosecurity hygiene measures are not in place
- Land clearance favours the establishment of weeds due to increased light and soil disturbance
- Inappropriate disposal and storage of putrescible wastes may attract feral animals

The pests and weeds currently occurring within the Study area are not expected to significantly proliferate in response to the Project activities. The main threat is the introduction of new weeds to the area via contaminated vehicles or soils. Impacts will be managed by implementing biosecurity hygiene and control measures during Project activities.

7.1.7 Fire

The Project is located within largely cleared grazing lands with tracts of sclerophyll woodlands mainly to the north. The woodland areas have potential to be severely impacted by accidental high-intensity fires caused by Project activities. Fire hazard mapping for Queensland indicates the majority of woodlands within the Study area as having a 'medium potential bushfire intensity'. There are very small pockets of 'high' potential bushfire intensity associated with woodland remnants in the south of the Study area on Meroo Downs and Memooloo properties.

Fire is noted as a threatening process on the Brigalow TEC occurring within the Study area. Project-specific fire management measures will be developed and implemented in line with Queensland guidelines and in collaboration with local landowners.

7.1.8 Surface Water

7.1.8.1 Construction Impacts

The Project has potential to impact surface water and associated aquatic ecology values through a variety of processes:

- During construction disturbance, uncontrolled sedimentation of watercourses (particularly during and following heavy rainfall events) can impact aquatic ecology by smothering stream beds with fine material, and decreasing bed roughness and reducing habitat diversity
- Similarly, uncontrolled sedimentation movements associated with construction disturbance may lead to localised increased turbidity and suspended solids which may negatively impact fish and macroinvertebrates (through reduced respiratory and feeding efficiency), and adversely affect submerged aquatic plants as light penetration (required for photosynthesis) is reduced
- Poorly designed and constructed waterway crossings may create waterway barriers that prevent or impede movements of aquatic fauna
- Waterway crossings may cause bank instability if remediation works are not adequately designed and implemented. This may lead to bank erosion (causing impacts to instream sedimentation and turbidity) and adverse impacts to riparian vegetation

Waterways in the Project area are highly ephemeral and were observed to be largely dry at the time of the 2022 and 2023 ecology surveys. The only waterways of any substantive size are Humboldt Creek and the Comet River (to the west of the Project). The Project will develop and implement an Erosion and Sediment Control Plan (ESCP) to mitigate uncontrolled sediment flows into waterways as a result of Project works.

Pipeline crossings at waterways will be avoided where possible during the final Project design phase. Where pipeline crossings are required (such as at Humboldt Creek), they will be located underground through the application of directional drilling. Where required, instream construction impacts such as trenching will be temporary and occur during the dry season to minimise the impact of sediment entrainment during rainfall-associated flow events.

7.1.8.2 Aquatic Pollutant Release

The accidental release of pollutants from Project activities has the potential to degrade the surrounding environment and local waterways within and downstream of the Project area. Potential sources of contaminants may include runoff from chemical and fuel/oil storage areas and general wastewater from vehicle/machinery washdown areas. In the event of a significant fuel spill (>200 litres) (L) to waterways there is potential to have a local impact on both flora and fauna. The extent of impact will of course be dependent on the size of the spill and the volume of water in the waterway (including whether there is flow), thereby influencing the length of stream potentially impacted.

Chemicals used in the CSG well drilling process may be toxic to the environment and have been subject to a number of assessments with regard to local CSG operations in southern Queensland (ERM 2017; KCB 2018). An assessment for the Atlas Project KCB identified chemicals used in the drilling process that could be toxic to fish, invertebrates and algae, although only if they were directly released to surface waters (KCB 2018). Conservative contaminant transport modelling concluded the likelihood for a drilling fluid to adversely affect

any MNES would be high unlikely to unlikely where appropriate mitigation controls are put in place, and the overall risk to MNES was assessed as low significance to insignificant (KCB 2018).

Nevertheless, despite the potential impacts broadly described above, it is noted the creeks in the Study area are highly ephemeral (no flows occurring the majority of the time) and are predominantly likely to be considered to be of low value (excepting Humboldt Creek and Comet River). Storage of chemicals associated with Project activities and vehicle refuelling sites will be located a minimum of 200 m from the nearest watercourse to further reduce the potential for accidental spills to impact waterways.

The Project will treat produced water generated by CSG extraction through reverse osmosis processing. Produced water will be stored in 'feed tanks' and saline water produce by processing will be stored in separate 'brine tanks' within the water treatment facility site. Treated water is proposed to be transferred to landholders for a beneficial use such as agriculture. The Project's treated wastewater will be managed under the State's End of Waste Code (EOWC) such that no impacts to aquatic ecological values are expected.

7.2 Proposed Mitigation Measures

The proponent will commit to a range of measures to minimise impacts to MNES, MSES and general ecological values associated with Study area. The final design process for the Project will reduce the area of impact to areas representing habitat for threatened species as much as is feasible for the construction of the required infrastructure. This has already been demonstrated through avoidance of vegetation clearing in remnant or regrowth vegetation communities and gilgai areas across the majority of the Project footprint and a commitment to underground pipeline installation at watercourse crossings (avoiding impacts to surface riparian vegetation and aquatic ecosystems). Where avoidance is not possible, a range of mitigation strategies will be implemented under an overarching Project Construction Environmental Management Plan (CEMP) and Operation Environmental Management Plan (OEMP). The CEMP and OEMP should be informed by a number of management plans relevant to ecological impacts including (but not limited to):

- Weed and Pest Management Plan
- Erosion and Sediment Control Management Plan
- Surface Water Management Plans
- Rehabilitation Management Plan

The CEMP, OEMP and various sub-plans will comprise a range of measures that will mitigate potential impacts to ecological values as detailed in **Table 13**.

Table 13. Recommended mitigation measures proposed for general impacts resulting from Project works

Impact	Management measure	Project timing
Vegetation clearing	The Project will develop a CEMP prior to works being carried out. Vegetation clearing protocols will be established within the CEMP and will include the following mitigations measures at a minimum.	Pre-construction
	A Rehabilitation Management Plan will be developed for the Project detailing the reinstatement goals, methods and monitoring protocols for those areas subject to post construction rehabilitation activities. The Plan will seek to reinstate construction areas subject to disturbance but not required for operation to the vegetation communities previously present on each site.	Prior to clearing
	Where possible the overall Project footprint will be refined and minimised further during the final design process	Final design
	Project employees and contractors should be made aware of environmental obligations and compliance requirements through the induction program.	Project induction
	Vegetation clearing extents will be clearly demarcated with flagging or bunting prior to clearing to limited the area safely and reasonably required for permanent and temporary works	Prior to clearing
	Targeted pre-clearance surveys will be carried out prior to vegetation clearing and will incorporate searches for threatened plants. Pre-clearance surveys will be carried out by suitable qualified ecologists prior to vegetation clearing.	Prior to clearing

Impact	Management measure	Project timing
	Topsoil should be stockpiled in wind rows and used for rehabilitation.	Following clearing
	Disturbed areas that are no longer required will be immediately reinstated to a non-polluting and stable landform.	Following construction
Fauna mortality	The designated Project Environmental Officer will develop a fauna register to record all fauna encountered during clearing works (as per fauna spotter-catchers) including fauna incidents (injuries and mortality).	Pre-construction
	Fauna spotter-catchers (licensed) will inspect sites prior to vegetation clearing. Fauna habitat shelter features (large hollows) will be clearly marked where they are unable to be accessed/inspected prior to tree felling.	Prior to clearing
	CEMP will incorporate procedures for tree felling that will minimise potential impacts on resident fauna where habitat shelter features are identified.	Prior to clearing
	CEMP will incorporate measures applicable to trenching activity. Trenches left open overnight will be inspected by a qualified fauna spotter each morning prior to works being carried out.	Prior to clearing
	Procedures will be in place where injured fauna are encountered during clearing works. Local wildlife carer and/or veterinarian will be identified prior to works being carried out and be notified that clearing works are being carried out (prior to clearing).	Ongoing
	Onsite speed limits will be established throughout Project area to limit the potential for road collisions.	Ongoing
Threatened flora and fauna	Fauna and Flora Management Plan will be in place prior to construction works being carried out. Plan will establish species-specific management procedures for threatened species considered to be potentially or likely to be present in this report.	Pre-construction
	Searches for threatened plant and fauna species will be carried out by a suitably qualified ecologist as part of pre-clearance surveys.	Pre-construction
	Project inductions will outline species of significance that may occur on the project area.	Project induction
	Project employees will be required to notify fauna spotter/catchers when a species of significance is observed in the Project area. All encounters with a threatened species will be recorded in the project fauna register maintained by the designated Environmental Officer.	Ongoing
Noise and lighting	The final Project design process will incorporate components (mechanical) and design elements to reduce ongoing operational noise from permanent Project infrastructure that has potential to impact adjacent fauna habitat (such as the gas processing facility).	Final design
	The final Project design process will incorporate the use of low light spill lighting components and directional lighting (away from adjacent fauna habitat) where night lighting is considered necessary.	Final design
	All Project-associated construction/operational machinery will be maintained as per manufacturer design specifications to ensure project noise is minimised.	Ongoing
	Onsite speed limits will be established throughout Project area to limit noise levels as a result of vehicle movements.	Ongoing
Airborne dust	Monitoring of weather conditions will be carried out to inform Project activities and planning during high-wind weather conditions.	Ongoing
	Ensure employees made aware of potential dust generating activities and mitigation and management measures to prevent nuisance	Ongoing
	Monitoring of air/dust emissions will be carried out in accordance with regulatory requirements.	Pre-construction

Impact	Management measure	Project timing
	Dust from areas likely to be a source of airborne dust (such as tracks and topsoil stockpiles) will be suppressed during construction using water trucks/wetting to keep dust related impacts to a minimum. Water used for dust suppression will be obtained from Project-associated produced water where possible.	During construction - as required
	Onsite speed limits will be established to minimise dust caused by vehicle movements	Ongoing
	Areas subject to vegetation clearing and no longer required for construction will be subject to vegetation reinstatement as soon as is practicable.	Ongoing
Weeds and pests	Weed and Pest Management Plan will be in place prior to construction works being carried out. Plan will detail all required management measures and monitoring procedures. Weed control strategies will be developed in line with the Central Highlands Regional Council biosecurity plan 2020-2025 (CHRC 2019).	Pre-construction
	Mapping of the extent of weed/pest occurrence within the Project footprint will be recorded during pre-clearance surveys.	Pre-construction
	Vehicle wash-downs will be required for all new vehicles (including earthmoving and other construction machinery) entering the Project area.	Ongoing
	Disposal and storage of putrescible wastes must be undertaken appropriately to ensure feral animals aren't attracted to the Project area.	Ongoing
	Storage of construction/operation materials carried out in a manner so as to not encourage the establishment of resident pest fauna.	Ongoing
	Regular monitoring of weed and pest occurrence in association with Project works areas and in response to complaints from adjacent landowners.	Ongoing
Fire	Monitoring of weather conditions will be carried out to inform Project activities and planning during high fire-risk weather conditions.	Ongoing
	The Project will maintain communications with local representatives for the Queensland Fire and Emergency Services (QFES) regarding Project activities and bushfire hazard conditions.	Ongoing
	Appropriate fire breaks will be maintained around above ground Project infrastructure.	Ongoing
	Site will include designated smoking areas.	Ongoing
	Onsite fire-fighting equipment will be regularly maintained and staff training will be developed and implemented.	Ongoing
Surface water	An ESCP will be developed and implemented prior to construction commencing. The ESCP will be developed by a Certified Professional in Erosion and Sediment Control and be in accordance with the International Erosion Control Association Best Practice Erosion and Sediment Control (2008).	Pre-construction
	Access track crossings of watercourses will be designed and constructed in accordance with the accepted development requirements for waterway barrier works (DAF 2018) to minimise impacts to fish passage.	Final design
	Applicable Project materials/chemicals will be stored and handled in accordance with relevant legislative requirements and Australian Standards including: <ul style="list-style-type: none"> AS 3780:2008 – The storage and handling of corrosive substances AS 1940:2004 – The storage and handling of flammable and combustible liquids AS 3833:2007 – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers 	Ongoing
	All storage of chemicals associated with Project works (including for CSG drilling works) will be stored a minimum of 200 m from the nearest watercourse.	Ongoing
	Refuelling will be in designated bunded areas a minimum of 200 m away from watercourses	Ongoing

Impact	Management measure	Project timing
	Spill response equipment (e.g. booms and absorbent materials) will be available at refuelling areas and other sites (where relevant). Staff will be trained in the appropriate use of spill response equipment.	Ongoing
	Onsite washdown areas for Project vehicles/machinery will be located and clearly demarcated to prevent contaminated run-off from entering waterways.	Ongoing
	<p>Wherever possible watercourse crossing will avoid instream works including through the use of directional drilling to locate pipelines under the watercourse. Where this is not possible (such as for new access tracks) works within a watercourse will be conducted in the following order of preference:</p> <ul style="list-style-type: none"> • Conducting works when no water is presence • Conducting works in times of no flow • Conducting works in times of flow but in a way that does not negatively impact the flow of water within the watercourse, permanently impound water or permanently divert the flow of water 	Ongoing
	As per the Rehabilitation Management Plan – disturbed riparian areas that are no longer required following construction will be immediately rehabilitated in line with the reference site nominated for the RE.	Following construction

8 RISK ASSESSMENT

A hazard and risk assessment was undertaken in accordance with AS/NZS ISO 31000:2018 Risk Management – guidelines and HB203:2006 Environmental risk management principles and processes, to provide an assessment of the potential risks from the project’s activities (refer **Section 7.1**) to the Environmental Values identified as present in this report, following the application of project-specific mitigation measures (refer **Section 7.2**)

8.1 Project Risk Assessment Method

The criteria adopted for assessing risk levels of identified hazards is shown in **Table 14**. Analysis of the consequence and likelihood was conducted to determine the risk rating given against each hazard (refer **Table 15** and **Table 16**). The risk assessment matrix in **Table 17** is a summary of the hazard and risk assessment findings for all stages of the Project (pre-construction, construction, operation, decommissioning).

Table 14. Risk Assessment Criteria

Likelihood	Consequence				
	Extreme 5	Major 4	Moderate 3	Minor 2	Insignificant 1
Almost Certain 5	Extreme (25)	Extreme (20)	Extreme (15)	High (10)	Moderate (5)
Likely 4	Extreme (20)	Extreme (16)	High (12)	Moderate (8)	Low (4)
Possible 3	Extreme (15)	High (12)	Moderate (9)	Moderate (6)	Low (3)
Unlikely 2	High (10)	Moderate (8)	Moderate (6)	Low (4)	Low (2)
Rare 1	Moderate (5)	Low (4)	Low (3)	Low (2)	Very low (1)

Table 15. Likelihood Scale

Level	Description	Definition
1	Rare	Unlikely to occur during a lifetime or very unlikely to occur
2	Unlikely	Could occur about once during a lifetime or more likely not to occur than to occur
3	Possibility	Could occur more than once during Project lifetime or more likely not to occur than to occur
4	Likely	Will probably occur in most circumstances
5	Almost Certain	Is expected to occur in most circumstances

Table 16. Consequence Scale

Level	Description	Definition
1	Insignificant	<ul style="list-style-type: none"> • Very low level environmental impacts confined to a small area within the project area • Prompt clean-up/restoration of environmental values • Negligible potential for negative media coverage
2	Minor	<ul style="list-style-type: none"> • Low environmental impact confined within the project area • Short-term clean-up/restoration of environmental values • Regulation breaches without fine or litigation • Negative local media coverage possible • Complaint from community
3	Moderate	<ul style="list-style-type: none"> • Moderate but reversible offsite environmental impacts, requiring short-term clean-up (weeks) • Onsite (within Project area) medium term impact requiring clean-up/restoration of environmental values • Regulation breaches resulting in fine or prosecution • Negative media coverage at local/regional level over more than one day with resulting impact to social/environmental capital
4	Major	<ul style="list-style-type: none"> • Major, offsite, environmental impacts requiring medium-term clean-up (months) • Onsite impact with irreversible residual damage or requiring significant clean-up effort (years) • Substantial impact to social/environmental capital, will attract public concern • Major litigation at operation level • Negative national media coverage
5	Extreme	<ul style="list-style-type: none"> • Prolonged or severe, offsite or regional environmental impacts requiring long-term clean-up (years) with irreversible residual damage • Extreme permanent loss of social/environmental capital, with anticipated major public outrage • Major litigation or prosecution at parent company level • Loss of environmental licence

8.2 Project Risk Assessment Findings

To quantify the potential for an impact to cause harm, a qualitative environmental risk assessment was undertaken using the ISO 31000:2009 Risk Management – Guidelines and HB 203:2012 Managing environment-related risk. The analysis outlines the risks associated with hazards identified in **Section 7.1**, using the risk criteria (consequence and likelihood) to allocate a risk rating for the hazard.

The risk assessment process was undertaken on both unmitigated risks and residual (mitigated) risks. This identified where additional management controls were needed to ensure the impacts and risks are as low as reasonably practical. **Table 17** provides a summary of the project risks.

Table 17. Project risk assessment - ecological matters

Hazard	Potential impacts	Risk rating (unmitigated)	Mitigation measures	Residual risk rating
Vegetation clearing – native vegetation	<ul style="list-style-type: none"> • The total area of the Project disturbance area is 178.27 ha and may result in clearing a maximum of 1.17 ha of remnant vegetation. Resulting impacts include: <ol style="list-style-type: none"> a) Loss of threatened flora species listed under EPBC Act and/or NC Act b) Loss of native vegetation c) Loss of ecosystem function 	Moderate (8)	<ul style="list-style-type: none"> • Project design has utilised further refinement to avoid TECs and endangered vegetation • Prior to construction project design may be refined further to minimise vegetation clearing footprint • Vegetation located adjacent to the project construction works will be appropriately marked to avoid unnecessary clearing/vegetation damage • Carry out pre-clearance protected plant surveys and use results to refine project design avoid clearing threatened flora • Progressive rehabilitation of areas cleared for construction but not required for operation will be undertaken as project progresses • Rehabilitation will be completed to the standards required of the EA conditions to inform the ‘final rehabilitation report’ as per the EA requirements 	Low (4)
Vegetation clearing – threatened native fauna habitat	<ul style="list-style-type: none"> • The current Project layout may result in clearing remnant/regrowth vegetation suitable for the following threatened fauna species considered likely or possibly occurring in Study area: <ol style="list-style-type: none"> a) Ornamental Snake – 0.89 ha b) Grey Snake – 0.89 ha c) Australian Painted Snipe – 0.89 ha d) Koala – 1.17 ha e) Squatter Pigeon – 1.17 ha 	Moderate (8)	<ul style="list-style-type: none"> • Project design has utilised further refinement to minimise vegetation clearing footprint • Measures in place within Fauna Management Plan including carry out pre-clearance surveys and (where possible) use results to refine project design avoid clearing identified threatened fauna habitat/sites • Vegetation located adjacent to the project construction works will be appropriately marked to avoid unnecessary clearing/vegetation damage • Progressive rehabilitation of areas cleared for construction but not required for operation will be undertaken as project progresses • Rehabilitation will be completed to the standards required of the EA conditions to inform the ‘final rehabilitation report’ as per the EA requirements 	Low (4)

Hazard	Potential impacts	Risk rating (unmitigated)	Mitigation measures	Residual risk rating
Vegetation clearing - loss of potential breeding/roosting habitat	<ul style="list-style-type: none"> Loss of potential breeding and resting sites for fauna including large tree hollows, fallen timber and surface rocks/rock piles Remnant vegetation throughout much of the Project area has been subject to past tree clearing/thinning. Large trees retaining large tree hollows used as potential breeding/roosting sites for a range of larger fauna are generally uncommon in the Study area 	Moderate (6)	<ul style="list-style-type: none"> Project design has been adjusted to avoid riparian vegetation featuring large hollow-bearing trees via underground drilling at watercourse crossings No unnecessary clearing of vegetation or damage to adjacent vegetation Fallen timber created by vegetation clearing should be scattered in adjacent habitats to provide offsite shelter habitat for fauna Progressive rehabilitation of areas cleared for construction but not required for operation will be undertaken as project progresses Rehabilitation will be completed to the standards required of the EA conditions to inform the 'final rehabilitation report' as per the EA requirements 	Low (3)
Habitat fragmentation and connectivity	<ul style="list-style-type: none"> The Project footprint is largely restricted to small areas (up to 1 ha for well pads) and narrow linear clearing (18 m wide disturbance corridor including 6 m for access tracks) impacts which largely occur in cleared lands The Landscape Fragmentation and Connectivity Tool identified no significant impact on connectivity area 	Low (3)	<ul style="list-style-type: none"> Progressive rehabilitation of areas cleared for construction but not required for operation will be undertaken as project progresses, thus reducing impacts to connectivity Rehabilitation will be completed to the standards required of the EA conditions to inform the 'final rehabilitation report' as per the EA requirements 	Low (3)
Fauna mortality – vegetation clearing	<ul style="list-style-type: none"> Accidental death of resident fauna during vegetation clearing 	Moderate (9)	<ul style="list-style-type: none"> Very little woody vegetation to be impacted by Project footprint Progressive rehabilitation of areas cleared for construction but not required for operation will be undertaken as project progresses, thus reducing impacts to connectivity Rehabilitation will be completed to the standards required of the EA conditions to inform the 'final rehabilitation report' as per the EA requirements 	Low (4)

Hazard	Potential impacts	Risk rating (unmitigated)	Mitigation measures	Residual risk rating
Fauna mortality – vehicle strike and trenching	<ul style="list-style-type: none"> Accidental death of resident fauna due to Project associated vehicle strike (increase in local vehicle traffic) Accidental death caused by overnight entrapment during trenching works for pipeline activities 	High (12)	<ul style="list-style-type: none"> Appropriate site speed limits set and enforced Open trenches to be inspected by a suitably experienced fauna spotter catcher prior to works being carried out each morning Staff and contractors educated on site values under project inductions and ongoing safety activities, and Monitoring/recording of fauna injury/mortality events to remediate 'high risk' areas 	Low (4)
Airborne dust	<ul style="list-style-type: none"> Dust escaping onto adjacent habitat and settling on plants due to earthworks and vehicle traffic. Dust generated by vehicles that settles on plants may interfere with plant health and community structure (although impact uncertain). 	Moderate (6)	<ul style="list-style-type: none"> Monitoring of weather conditions to guide project activities during dry, windy conditions Monitoring of air/dust emissions will be carried out in accordance with regulatory requirements Progressive rehabilitation to limit exposed land Water truck to be used for dust suppression where deemed necessary Vehicle speeds to be reduced to 40 km/h on unsealed roads 	Low (4)
Noise - created by Project activities (construction and operation)	<ul style="list-style-type: none"> Noise may negatively impact on fauna behaviour and physiology Impact likely to be localised (to area of noise source), response will be species-specific, and potentially temporal (individuals may become accustomed to ongoing noise), and Construction noise will be temporary with major operation noise restricted to gas processing facility area located in cleared habitat 	Moderate (6)	<ul style="list-style-type: none"> Final design will incorporate noise management strategies where possible (with regard to design of permanent gas processing facility and water management plant) Vehicle speed limits implemented across site to reduce noise levels Training on noise mitigation strategies will be undertaken Regular service and maintenance of equipment/machinery - excessively noisy plant will be tagged out and repaired immediately 	Low (3)
Lighting	<ul style="list-style-type: none"> Artificial lighting may negatively impact on fauna behaviour and physiology Impact likely to be localised (to area of light source), and response will be species-specific 	Moderate (6)	<ul style="list-style-type: none"> Final design will incorporate light management strategies where possible (with regard to design of permanent gas processing facility and water management plant) Project lighting will be minimised (low luminance) as far as possible and directed away from fauna habitat 	Low (3)

Hazard	Potential impacts	Risk rating (unmitigated)	Mitigation measures	Residual risk rating
	<ul style="list-style-type: none"> Major ongoing operational source of lighting impact restricted to gas processing facility located in cleared lands 		<ul style="list-style-type: none"> Construction is expected to be carried out largely during daylight hours Night lighting will be lights required for safety and security 	
Weeds and pests	<ul style="list-style-type: none"> Project vehicles/plant may introduce and spread weed seeds Vegetation clearing within native vegetation, although minor in extent, may favour the establishment of weeds in native habitats due to increased light/soil disturbance, and Project infrastructure and food waste may favour the establishment of resident populations of feral predators 	High (12)	<ul style="list-style-type: none"> A Weed and Pest Management Plan will form part of the Project CEMP and OEMP and be implemented over the life of the project Project employees and contractors will be made aware of obligations related to weed and food waste management through a site induction program Vehicles to be washed and certified clean prior to arrival onsite All machinery and equipment brought to the site will be cleaned Minimise the use of off-road vehicle movements Implementation of erosion and sediment control measures to minimise the risk of weed seed washing into local watercourses Areas subject to vegetation clearing should be subject to regular weed inspections and new weed infestations should be recorded and controlled Infestations of weeds/pests listed as Restricted Matters (as listed under the Biosecurity Act) and WoNs onsite will only be dealt with and/or disposed of in a way prescribed under regulation and/or as recommended by DAF 	Moderate (6)

9 SIGNIFICANT RESIDUAL IMPACT ASSESSMENT – MNES AND MSES

9.1 Matters of National Environmental Significance Assessment

The EPBC Act defines and protects nine matters considered to be of MNES. Under Part 3 of the EPBC Act, a person must not undertake an action that will have, or is likely to have, a significant impact on a protected matter, without approval from the Minister.

One TEC, nine threatened species and six bird species listed as Migratory under the EPBC Act have some potential to occur in the Study area (refer **Table 8** and **Table 10**) comprising the following MNES:

- Known to occur:
 - Brigalow TEC – Endangered
 - White-throated Snapping Turtle – Critically Endangered
- Likely to occur
 - Annual wiregrass – Vulnerable
 - Ornamental Snake – Vulnerable
 - Koala – Endangered
- Possibly occurs - flora:
 - Ooline - Vulnerable
- Possibly occurs - fauna:
 - Australian Painted Snipe – Endangered
 - Squatter Pigeon (southern) – Vulnerable
 - Painted Honeyeater - Vulnerable
 - Grey Snake – Endangered
- Possibly occurs - migratory
 - Glossy Ibis
 - Latham’s Snipe
 - Sharp-tailed Sandpiper
 - Gull-billed Tern
 - Caspian Tern
 - Fork-tailed Swift

An assessment of the potential for significant impacts resulting from the Project activities was carried out only on those MNES considered as potentially subject to substantial impacts. The assessments have been carried out in accordance with the *MNES significant impact guidelines 1.1* (MNES Guidelines) (DE 2013a)

The gas field disturbance footprint largely avoids impacts woody vegetation. As stated previously (refer **Section 7.1.1**) the impact assessment does not include an assessment of the potential impacts associated with the export pipeline.

9.1.1 MNES Not Subject to Significant Impact Assessment

The current layout of the gas field infrastructure impacts a maximum of 1.17 ha encompassing a single RE comprising Poplar Box woodland (refer **Table 12**). All occurrences of Brigalow TEC have been avoided and no potential for significant impacts are considered possible.

White-throated Snapping Turtle was recorded to the immediate west of the Study area at a waterhole on the Comet River. There is no suitable habitat present within the Study area itself which comprises ephemeral waterways including Humboldt Creek. No activities associated with the Project will impact the Comet River,

either through direct disturbance or indirectly (no impact to habitat or water quality values). The species will not be impacted by the Project.

Impacts to fauna associated with the presence of woody vegetation include the following species: Squatter Pigeon (southern). The species occurs across a very large area within central Queensland. The Project proposes to clear a maximum of 1.17 ha of potential habitat for the species. There is abundant identical habitat remaining in the Study area which will not be impacted. The potential impact on Squatter Pigeon is considered very minor at worst and it is not assessed further. Brigalow communities as well as other acacia dominant communities provide the preferred habitat supporting the mistletoe species associated with Painted Honeyeater. No Brigalow communities will be impacted and as such, there are no impacts expected on this species.

Ooline is known from Cape York Peninsula, including sites near Musgrave, the Irvineband to Petford area, and south-west of Mt Garnet (DEWHA 2008). Suitable habitat for the species occurs throughout the Study area in the form of Brigalow and to a lesser extent Poplar box dominated woodland and open-forest. The species is distinctive (i.e. readily observable where it occurs) and was not observed during project field surveys. The only suitable habitat for the species within the disturbance footprint is provided by remnant RE 11.5.3 (Poplar Box woodland) with a total area of 1.17 ha occurring within the disturbance footprint. Brigalow communities which are more likely to support the species have been avoided. The extent of disturbance is considered negligible given the species was not observed within the disturbance footprint.

Aristida annua is restricted to central Queensland in the Emerald and Springsure districts where it is known to occur in eucalypt woodlands (with *Eucalyptus orgadophila*) and natural grasslands on basalt derived black clay soils (DE 2014a). The species was not detected within the Study area during field surveys but is considered a possible occurrence within the Study area. Potential habitat for the species within the Study area is considered to be restricted to Brigalow habitats on land zone 4 (RE 11.4.8 and 11.4.9). These communities have been avoided and no impact on the species is expected.

There is a possibility for a number of migratory wetland-associated bird species to be present. The Project will not impact any of the existing waterbodies, including several farm dams of various sizes, within the Study area. Gull-billed Tern or Caspian Tern will not be impacted by the Project as a result. Following heavy rainfall events three of the species (Sharp-tailed Sandpiper, Latham's Snipe and Glossy Ibis) may also have a low potential to use water-filled gilgais within the Study area although no migratory species were identified during either Project survey. Any potential impacts on these species are considered to be of a very minor risk and managed under general mitigation measures outlined in **Section 7.2**.

Fork-tailed Swift is an aerial species that may occur over any habitat including inland, coastal and marine areas and disturbed habitat such as urban areas. It has only occasionally been recorded as landing in Australia. The species is highly mobile and may forage anywhere from 1 m up to 100s of metres above ground (Higgins 1999; DCCEE 2023). Given the species' aerial habits it is inconceivable the Project area would represent 'important habitat' (as defined in DE 2013a) for the species and the Project activities would be highly unlikely to impact the species in any way.

9.1.2 Significant Impact Assessment – Threatened Species

With regard to species listed as vulnerable the significant impact assessments commence with an evaluation of the likely importance of the population of vulnerable fauna species associated with the Project area and immediate surrounds. Under four of the nine assessment criteria identified within the MNES guidelines, vulnerable species are considered as subject to significant impacts when an 'important population' is impacted.

An 'important population' for vulnerable species as defined within the MNES guidelines is as follows:

- '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

Given the specificity of the above definition and the often scarce ecological information and occurrence records available for many threatened species and populations in Australia, it is difficult to determine either of:

- Attributes such as breeding and dispersal behaviour and whether the population is a 'key source' or
- The genetic diversity of individuals inhabiting a regional population or sub-population

A single assessment criterion (for vulnerable, endangered and critically endangered species) refers to impacts on 'habitat critical to the survival of a species or ecological community' which is defined under the MNES Guidelines as areas that are necessary:

- For activities such as foraging, breeding, roosting, or dispersal
- For long-term maintenance of the species or ecological community
- To maintain genetic diversity and long-term evolutionary development and/or
- For the reintroduction of populations or recovery of the species or ecological community

Such habitats may be, but are not limited to:

- Habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community

Many species do not have approved recovery plans and 'habitat critical to the survival of a species' is generally not identified in available literature. For species that have a wide distribution/occurrence, habitat considered as that necessary for 'foraging, breeding, roosting or dispersal' is a broad definition that is not necessarily analogous with the definition of critical at a species level. Given the relative lack of information that is often available, significance of impacts to threatened species has been based on the professional expertise of the assessment team and the latest available information relating to species habitat and ecological requirements and distribution.

Assessment of the significance of impact in accordance with the criteria contained within the MNES Guidelines has been undertaken for the six threatened species that are considered to be likely or possibly occurring and potentially subject to substantial impacts from the Project. The significant impact assessments are provided in the following sections covering species information relevant to the assessment and an assessment table using the criteria set out in the MNES Guidelines.

Under the assessments, a significant impact is not considered to be likely to occur as a result of the Project activities.

9.1.2.1 Ornamental Snake – Vulnerable

Ecology

Ornamental Snake is largely restricted to low-lying areas with deep-cracking clay soils, which are subject to seasonal flooding, and adjacent areas of clay and sandy loams. Habitat includes woodland and shrubland, such as Brigalow, and riverine habitats, where the species lives in soil cracks and under fallen timber (Ehmann 1992; Wilson & Swan 2010). The species may be found in areas of simple habitat structure, such as paddocks, grasslands and regrowth if frogs are present (Melzer 2012).

The species apparently feeds exclusively on frogs (Wilson & Swan 2017) and can change from being abundant to absent over a few hundred metres due to changes in soil type or topography (Swan & Wilson 2008). Recent collecting from large-scale trenches for pipelines has shown the species to be much more common than previously thought (Swan & Wilson 2012).

Association with Study area

Not recorded during surveys for the Project despite ideal conditions occurring during the January-February survey period (i.e. frog prey abundant and active, waterbodies commonly present and warm humid nights). There are three database records located within 50 km of the Study area. The nearest of these is from 1995 and located 22 km north but appears to be erroneously located based on the site information associated with the record. There are two other records to the north-west and south which are at least 40 km from the Project.

Targeted surveys for Ornamental Snake in the area have been carried out in the local region in recent years including the following:

- Ecological reporting for the Mahalo Gas Project (Golder 2018) – included targeted nocturnal surveys across three properties. Four sites located on Struan property to the immediate south of Meroo Downs (6 hours of survey effort – two personnel). Ornamental Snake (14 individuals) recorded to the south-east of the Study area on Humboldt and Somerby properties (7 km south-east and 10 km south of the eastern extent of the Study area respectively) (refer Figure 5 and Figure 14 in Golders 2018 for survey sites and species record locations).
- Ecological reporting for the Blackwater South Project (EMM 2022) – included targeted nocturnal surveys, pitfall and funnel trapping lines and active targeted searches (spotlighting and habitat searches) for Ornamental Snake. Four trap sites and six targeted Ornamental Snake sites located on Togara encompassing the eastern portion of the current Study area. Also, several sites to the immediate east on Memooloo property. Ornamental Snake (16 individuals across two survey periods in 2019 and 2020) recorded to the east and south-east of the eastern extent of the Study area. Not recorded within current Study area. Two individuals recorded 2 km east of the Study area (approximate locations shown on **Figure 9**) (refer Figure 5.1 and Figure 5.4 in EMM 2022 for survey sites and all species record locations).

There is abundant potential habitat present for the species on Togara property in the form of scattered gilgais on cracking clay soils. Some areas appear to have been subject to limited ploughing and soil surface structure was often affected by cattle compaction. Potential habitat is not considered to occur on Meroo Downs which has been subject to intensive land management and has eliminated gilgai structures on the property. An indicative map of potential habitat for Ornamental Snake within the Study area has been developed based on habitat features observed during onsite habitat assessments (i.e. presence of gilgais and cracking clay soils) and analysis of aerial imagery (refer **Figure 9**).

Nevertheless, it is noted the species was not observed despite ideal survey conditions in January-February 2023. It is also noted Cane Toads were abundant throughout the Study area.

DCCEEW approved species documents

There is no approved recovery plan for the species and no adopted threat abatement plan is considered relevant to the species. The Approved Conservation Advice (DE 2014b) for the species notes the following potentially threatening processes considered relevant to Ornamental Snake:

- Habitat loss and fragmentation due to land clearing (past and present)
- Habitat degradation caused by feral pigs
- Poisoning through ingestion of Cane Toads

There are no identified important populations or definitions of habitat critical to the survival of the species. The *Draft referral guidelines for the nationally listed Brigalow Belt reptiles* (Referral guidelines) (DSEWPC 2011) considers the presence of important habitat for this species a surrogate for an important population. The Study area is mapped as occurring within the known/likely distribution of the species (DCCEEW 2023). Important habitat is described as ‘gilgai depressions and mounds’ which occur within the Study area. Given gilgais occur the Study area has potential to comprise important habitat for the species under this definition.

The Referral guidelines notes that clearing of two or more hectares of important habitat may comprise a high risk of a significant impact on the species. The Project habitat mapping for the species (refer **Figure 9**) indicates there is potentially 1,513 ha of suitable habitat within the Study area. The Project layout currently proposes to impact up to 0.89 ha of cleared gilgai habitat which represents only 0.058% of the mapped habitat occurring within the Study area. At this stage it is predicted that four production wells will be drilled each year limiting the overall impact at any one time.

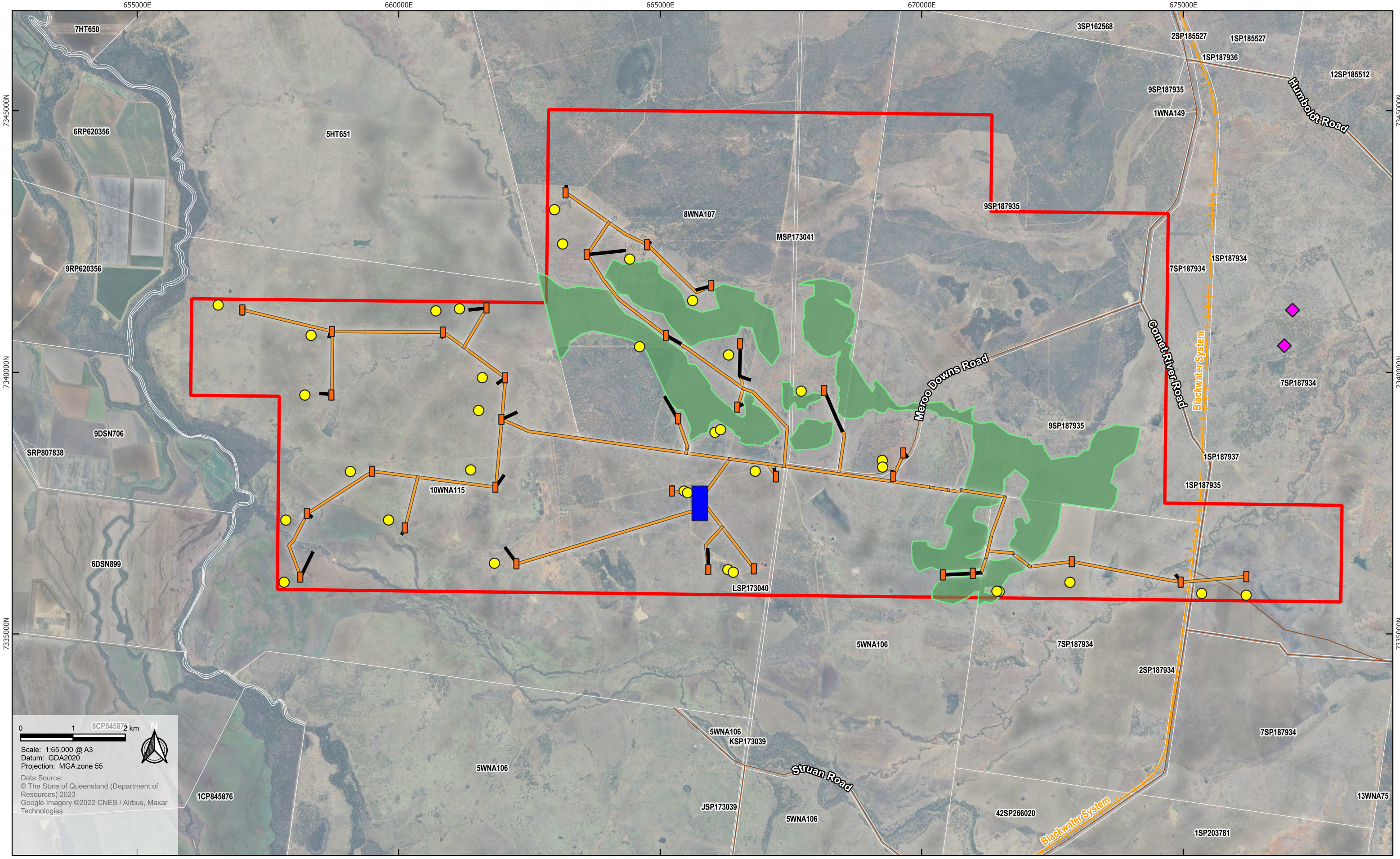
Much of the overall construction disturbance area will be reinstated following completion of construction. Well pads will be reduced from a 1 ha disturbance area to 0.04 ha of operational area with the remainder subject to revegetation. The layout of the gathering pipeline disturbance has been subject to revision in order to minimise impact on the identified gilgai habitat and will be restricted to a width of 6 m in these areas.

Table 18 provides an assessment of the potential for significant impacts on Ornamental Snake from the Project activities using the assessment criteria for vulnerable species outlined in the MNES Guidelines.

Table 18. Significant impact criteria assessment: Ornamental Snake

Criteria	Vulnerable species assessment
Lead to a long-term decrease in the size of an important population of the species	<p>Ornamental Snake was not recorded within the Study area during Project surveys despite ideal conditions for detecting the species. Ornamental Snake has been recorded in the wider area during recent surveys for other projects (Golder 2018; EMM 2022). This includes records located 2-2.5 km east of the Study area. Habitat mapping indicates there is 1,513 ha of gilgai habitat present within the Study area which may be suitable for the species (refer Figure 9). Important habitat is considered a surrogate for an important population of the species and may be considered as present.</p> <p>The disturbance footprint will impact a maximum area of 0.89 ha of gilgai habitat over the operational life of the Project. The Project has avoided areas of extant Brigalow communities comprising gilgai habitat. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Following well construction at a site any further disturbance will be negligible. Construction noise/vibration disturbance will be localised and temporary. Construction areas no longer required for operations will be revegetated (i.e. well sites only require 0.04 ha of cleared area for operational purposes). The Project is not considered likely to lead to a long-term decrease in the size of an important population of Ornamental Snake.</p>
Reduce the area of occupancy of an important population	<p>Ornamental Snake was not recorded within the Study area during Project surveys despite ideal conditions for detecting the species. Ornamental Snake has been recorded in the wider area during recent surveys for other projects. Important habitat for the species may be considered as present. The disturbance footprint will impact a maximum area of 0.89 ha of suitable habitat over the operational life of the Project. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Construction areas no longer required for operations will be revegetated (i.e. well sites only require 0.04 ha of cleared area for operational purposes). The Project is not considered likely to reduce the area of occupancy of an important population of Ornamental Snake to the extent a significant impact would be incurred on the species.</p>
Fragment an existing important population into two or more important populations	<p>Ornamental Snake was not recorded within the Study area during Project surveys despite ideal conditions for detecting the species. Ornamental Snake has been recorded in the wider area during recent surveys for other projects. Important habitat for the species may be considered as present. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The Project will not fragment an existing important population of the species.</p>
Adversely affect habitat critical to the survival of the species	<p>There is no definition of critical habitat for the species. Important habitat is considered as present in the form of gilgai depressions. The disturbance footprint will impact a maximum area of 0.89 ha of gilgai habitat over the operational life of the Project, much of which will be revegetated following construction completion. Habitat mapping indicates there is 1,513 ha of cleared gilgai habitat within the overall Study area. The Project is considered unlikely to affect habitat critical to the survival of the species to the extent a significant impact would be incurred on the habitat present in the Study area.</p>
Disrupt the breeding cycle of an important population	<p>Ornamental Snake was not recorded within the Study area during Project surveys despite ideal conditions for detecting the species. Ornamental Snake has been recorded in the wider area during recent surveys for other projects. Important habitat for the species may be considered as present. The breeding biology of the species is little known. The disturbance footprint will impact a maximum area of 0.89 ha of suitable habitat over the operational life of the Project. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. These occur in scattered locations within the Study area. While there may be some potential for the Project to disrupt the breeding cycle of individuals of the species (should it be found to be present) it will not be to the extent a population would be significantly impacted.</p>

Criteria	Vulnerable species assessment
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Important habitat for the species may be considered as present. The disturbance footprint will impact a maximum area of 0.89 ha of suitable habitat over the operational life of the Project. The Project has avoided areas of extant Brigalow communities comprising gilgai habitat where possible. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The Project is considered unlikely to impact the availability or quality of habitat present to the extent the species would decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species habitat	Cane Toads were observed to be abundant and are a known threat to Ornamental Snake. Evidence of feral pigs was observed in the Study area and is also considered a threat to the species. A weed and pest management plan will be developed and implemented, including the construction and operational phases of the Project. The Project will not result in the introduction of a novel invasive species, or proliferation of an existing invasive species in the Project area or surrounds.
Introduce disease that may cause the species to decline	There are no identified introduced diseases or pathogens associated with this species. The Project activities do not require the importation of soils or other biological matters into the Project area. Machinery imported from outside the region for Project earthworks, transportation and other construction activities will be required to be certified free of weed seeds and soil matter prior to entry onsite. It is inconceivable the Project activities will result in the introduction of a disease causing the species to decline.
Interfere substantially with the recovery of the species	<p>The Approved Conservation Advice for the species identifies the following priority actions as relevant for Ornamental Snake:</p> <ul style="list-style-type: none"> • Monitor known populations, key habitat and conservation areas and the effectiveness of any implemented management actions • Identify high conservation value populations and investigate conservation arrangements on public and private lands • Minimise adverse land use impacts at sites where the species is known to occur • Manage the impact of feral pigs where the species is known to occur • Develop and implement a Cane Toad management plan for the region (DE 2014b) <p>There is no conceivable reason the Project’s activities would interfere with any of the management priorities identified above. The project’s disturbance footprint with regard to potential habitat for the species is relatively minor. The Project will not interfere with the recovery of the species.</p>
Assessment result	The species has not been recorded within the Study area but important habitat is considered as potentially occurring. The Project’s extent of impact to suitable habitat comprising gilgais in cleared lands is minor given the extent of habitat present within the Study area. Based on the assessment above it is considered unlikely a significant to Ornamental Snake will occur as a result of the Project.



Filepath: -BAA\BAA220014.01 Comet Ridge Mahalo North\Workspaces\BAA220014.01 Mahalo North\1_Petroleum Lease\2_Terrestrial Ecology\EAR\Rev 2\Figure 9 Study area mapping of gilgai habitat.qgz

0 1 8CP845872 km

Scale: 1:65,000 @ A3
 Datum: GDA2020
 Projection: MGA zone 55

Data Source:
 © The State of Queensland (Department of Resources) 2023
 Google Imagery ©2022 CNES / Airbus, Maxar Technologies

Legend

- Petroleum Lease application area
- Cadastre (DCDB)
- Gilgai habitat
- Roads and tracks
- Railways
- ◆ Ornamental Snake record (EMM2022)

- Infrastructure (indicative only)**
- Gas compression facility
 - New access tracks
 - Indicative gathering lines

- Gas production wells**
- Indicative lateral well
 - Indicative vertical well



**Comet Ridge
 Mahalo North CSG Project
 Ecological Assessment Report**

Figure 9
 Study area mapping of gilgai habitat
 potentially suitable for Ornamental Snake and
 Australian Painted Snipe

9.1.2.2 Grey Snake - Endangered

Ecology

Grey Snake occurs in central inland New South Wales, in south-east Queensland and north to Rockhampton in central Queensland. The species is largely confined to the Brigalow Belt bioregion and, although sparsely distributed, can be locally common (Hobson 2012). The species occurs on floodplains (Ehmann 1992) and is often found in seasonally inundated areas, preferring cracking, flood-prone clay or loam soils and areas with gilgais. Habitats include grassland and woodlands such as Brigalow, Belah and Poplar Box (Hobson 2012). The species is often found in riverine habitats near watercourses and natural levees (Ehmann 1992). Grey snakes also inhabit dry eucalypt forest and occasionally pasture (Covacevich & Wilson 1995). Although the species shows some tolerance for such cleared or modified habitats, some regrowth has been present for most records from such habitat (Hobson 2012).

Grey Snakes are crepuscular and nocturnal frog-eating specialists (Wilson & Swan 2017), that occasionally also eat lizards (Ehmann 1992). Individuals are usually found under fallen or embedded logs and flood debris or in soil cracks and burrows, generally near waterbodies (Ehmann 1992; Richardson 2008; Hobson 2012). They are known to give birth to up to 16 live young (Ehmann 1992), but little else is recorded of their breeding biology.

Association with Study area

The species was not recorded during surveys for the Project or for other projects in the local region (Golder 2018; EMM 2022). There is a 2003 record located 38 km north of the Study area. There is a record of uncertain origin located 127 km north north-west of the Study area. The validity of these records cannot be verified. All other records are from the Rockhampton area (>190 km east) or much further south around Roma and Miles (>270 km from the Study area). The distribution of the species appears uncertain and dispersed. The Approved Conservation Advice for the species (DCCEEW 2022) notes almost all Queensland records are from the southern Brigalow Belt on the Condamine and Macintyre River floodplains, the Darling Downs and Lockyer Valley in south-east Queensland, Currawinya area in south-west Queensland and near Rockhampton.

Commonwealth Government habitat mapping indicates the species 'may occur' within the Study area (rather than being likely to occur). There is substantial gilgai habitat present within the Study area. However, it is noted woody regrowth in this habitat largely only occurs as scattered individual trees or very small patches. In general, the gilgai habitat remains cleared of overhead vegetation which the species appears to prefer.

DCCEEW approved species documents

There is no approved recovery plan for the species and no adopted threat abatement plan is considered relevant to the species. The Approved Conservation Advice (DCCEEW 2022) for the species notes the following potentially threatening processes considered relevant to Grey Snake:

- Habitat loss and fragmentation due to land clearing, agriculture and grazing impacts
- Diversion of water for irrigated agriculture
- Pesticide and herbicide use on floodplains
- Predation by feral pigs, cats and Red Fox
- Poisoning through ingestion of Cane Toads
- Coal and gas extraction developments
- Increased fire frequency

There are no identified important populations or definitions of habitat critical to the survival of the species. There is suitable gilgai habitat present within the Study area although much of this lacks the woody cover the species is associated with. The actual occurrence of the species in the region is uncertain.

The extent of gilgai habitat within the Study area has been depicted in **Figure 9** and indicates there is potentially 1,513 ha of suitable habitat within the Study area. The Project layout currently proposes to impact up to 0.89 ha of cleared gilgai habitat which represents only 0.058% of the mapped habitat occurring within the Study area. At this stage it is predicted that four production wells will be drilled each year limiting the overall impact at any one time.

Table 19 provides an assessment of the potential for significant impacts on Grey Snake from the Project activities using the assessment criteria for Endangered species outlined in the MNES Guidelines.

Table 19. Significant impact criteria assessment: Grey Snake

Criteria	Endangered species assessment
Lead to a long-term decrease in the size of a population of the species	<p>The species has not been recorded within the Study area and has not been recorded in the wider area during recent surveys for other projects (Golder 2018; EMM 2022). There is no evidence a population occurs in the region. Almost all Queensland records are from the southern Brigalow Belt on the Condamine and Macintyre River floodplains, the Darling Downs and Lockyer Valley in south-east Queensland, Currawinya area in south-west Queensland and near Rockhampton (DCCEEW 2022). There is substantial gilgai habitat present within the Study area, although in general, the gilgai habitat remains cleared of the overhead woody vegetation the species is thought to prefer.</p> <p>The disturbance footprint will impact a maximum area of 0.89 ha of low value gilgai habitat over the operational life of the Project. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Following well construction at a site any further disturbance will be negligible. Construction noise/vibration disturbance will be localised and temporary. Construction areas no longer required for operations will be revegetated (i.e. well sites only require 0.04 ha of cleared area for operational purposes). The Project is not considered likely to lead to a long term decrease in the size of a population of Grey Snake.</p>
Reduce the area of occupancy a population	<p>The species has not been recorded within the Study area and has not been recorded in the wider area during recent surveys for other projects (Golder 2018; EMM 2022). There is no evidence a population occurs in the region. Almost all Queensland records are from scattered areas much further south or east of the Study area. The disturbance footprint will impact a maximum area of 0.89 ha of low value gilgai habitat over the operational life of the Project. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Construction areas no longer required for operations will be revegetated (i.e. well sites only require 0.04 ha of cleared area for operational purposes). The Project is not considered likely to lead to reduce the area of occupancy of a population of Grey Snake.</p>
Fragment an existing population into two or more populations	<p>The species has not been recorded within the Study area and has not been recorded in the wider area during recent surveys for other projects (Golders 2018; EMM 2022). There is no evidence a population occurs in the region. Almost all Queensland records are from much further scattered areas much further south or east of the Study area. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The Project will not fragment an existing population of the species.</p>
Adversely affect habitat critical to the survival of the species	<p>There is no evidence habitat critical to the survival of the species is present. The disturbance footprint will impact a maximum area of 0.89 ha of low value gilgai habitat over the operational life of the Project. Habitat mapping indicates there is over 1,513 ha of cleared gilgai habitat within the overall Study area. The Project is considered unlikely to affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of a population	<p>The species has not been recorded within the Study area and has not been recorded in the wider area during recent surveys for other projects (Golder 2018; EMM 2022). There is no evidence a population occurs in the region. The breeding biology of the species is little known. The disturbance footprint will impact a maximum area of 0.89 ha of low value gilgai habitat. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. These occur in scattered locations within the Study area. While there may be some potential for the Project to disrupt the breeding cycle of individuals of the species (should it be found to be present) it will not be to the extent a population would be significantly impacted.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of	<p>The species has not been recorded within the Study area and has not been recorded in the wider area during recent surveys for other projects (Golder 2018; EMM 2022). There is no evidence a population occurs in the region. The disturbance footprint will impact a maximum area of 0.89 ha of low value gilgai habitat over the operational life</p>

Criteria	Endangered species assessment
habitat to the extent that the species is likely to decline	of the Project. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The Project is considered unlikely to impact the availability or quality of habitat present to the extent the species would decline.
Result in invasive species that are harmful to an endangered species becoming established in the endangered species habitat	Cane Toads were observed to be abundant and are a known threat to Grey Snake. Feral cat was observed in the Study area and is also considered a threat to the species. A weed and pest management plan will be developed and implemented, including the construction and operational phases of the Project. The Project will not result in the introduction of a novel invasive species, or proliferation of an existing invasive species in the Project area or surrounds. The Project will not impact the availability or quality of habitat present to the extent the species would decline.
Introduce disease that may cause the species to decline	There are no identified introduced diseases or pathogens associated with this species. The Project activities do not require the importation of soils or other biological matters into the Project area. Machinery imported from outside the region for Project earthworks, transportation and other construction activities will be required to be certified free of weed seeds and soil matter prior to entry onsite. It is inconceivable the Project activities will result in the introduction of a disease causing the species to decline.
Interfere with the recovery of the species	The Approved Conservation Advice for the species identifies the following conservation and management priorities as relevant for Grey Snake: <ul style="list-style-type: none"> • Undertake surveys and population monitoring across the species distribution in both known occupied areas and areas in which the species hasn't been recorded • Protect the species habitat from degrading agricultural practices, and the impacts of cattle and feral pigs • Investigate the hydrological requirements to sustain the species habitat and ensure future development maintains hydrological interchange across populations • Ensure land managers target feral pig management • Protect the species habitat with reserves and improve habitat values in other areas • Apply control programs for feral cats, Red Fox and pigs in Grey Snake habitat and allow Cane Toad resistant populations to recover (DCCEEW 2022) There is no conceivable reason the Project's activities would interfere with any of the management priorities identified above. The project's disturbance footprint with regard to potential habitat for the species is relatively minor and there is no evidence the species would occur. The Project will not interfere with the recovery of the species.
Assessment result	It is uncertain if the species actually occurs within the Study area or the region. The Project's extent of impact to low-value habitat comprising gilgais in cleared lands is minor given the extent of habitat present within the Study area. Based on the assessment above it is considered unlikely a significant impact to Grey Snake will occur as a result of the Project.

9.1.2.3 Australian Painted Snipe - Endangered

Ecology

Australian Painted Snipe is typically recorded singly or in small groups in freshwater marshes. They are extremely nomadic, moving in response to local rainfall and flooding. Although its occurrence in a location is often erratic, with the bird absent some years and common in others (Marchant & Higgins 1993) there is indication of some regular seasonal migration, e.g. to central and north coastal Queensland in autumn and winter (Black et al. 2010). Breeding only occurs in swamps with temporary water regimes and complex shorelines forming islands, shallow water, exposed wet mud and dense low fringing vegetation (Rogers et al. 2005; Geering et al. 2007). During non-breeding periods they may be found in a wider range of habitats including dams, rice paddocks, waterlogged grasslands, roadside drains and even brackish waterways (Marchant & Higgins 1993).

Association with Study area

The species was not recorded during surveys for the Project or for other projects in the local region (Golder 2018). EMM (2022) note the species had been observed in 2019 on the northern lease associated with the

Blackwater Mine (north-east of the Study area). There are two undated Birdlife Australia records of the species located 40 and 50 km east of the Study area (ALA 2023). The species may use farm dams in the Study area. Gilgais may provide ephemeral habitat for the species following heavy rains. It is noted most gilgai areas observed in the Study area were heavily vegetated and were generally unsuitable for the species presence as it requires open shallow, muddy areas for feeding.

DCCEEW approved species documents

The *Draft national recovery plan for the Australian Painted Snipe* (Australian Painted Snipe Recovery plan) (DEE 2020) has not been adopted under the EPBC Act but is considered in this assessment. No adopted threat abatement plan is considered relevant to the species. The Australian Painted Snipe Recovery plan identifies the following potentially threatening processes considered relevant to the species:

- Loss and degradation of wetland habitat including grazing and trampling by livestock and other introduced herbivores
- Diversion of water for irrigated agriculture
- Drainage and fragmentation of wetland habitat and reduced water quality
- Changes to plant cover in wetlands by invasive and native plant species
- Climate change
- Livestock overgrazing
- Predation by invasive species such as cats and Red Fox

Important populations are not relevant to the species as it is listed as endangered under the EPBC Act. The MNES Guidelines require consideration of impacts to populations. However, the species occurs as a single, homogenous breeding population and generally occurs in low numbers at a location (usually <10 individuals) (Garnett et al. 2011). The minimum extent of occurrence is estimated at 7,900,000 km² (Garnett & Baker 2021). As such, a population cannot be reliably attributed to the Study area.

Breeding habitat is thought to be quite specific and comprises shallow wetlands, with areas of exposed mud, and mixed heights of vegetative cover. Nests are almost always associated with small islands in freshwater wetlands (Rogers et al. 2005). Gilgai landforms comprising extensive systems of small mounds (1-3 m diameter) and hollows are also thought to be suitable (DEE 2020). Gilgais in the Study area occurred largely as scattered shallow depressions which were densely vegetated. A dense cover of the introduced Buffel Grass is dominant throughout. Breeding habitat is not considered to occur in the Study area.

Habitat considered critical to the survival of Australian Painted Snipe is considered in the Australian Painted Snipe Recovery plan to include:

- Habitat where the species is mapped as known or likely to occur especially where suitable breeding habitat occurs
- Locations outside the area identified above that may be periodically occupied when conditions are favourable

The Study area is located outside the species distribution mapped as known or likely to occur and suitable breeding habitat is not considered to occur. Given the paucity of records from the surrounding area and the habitat values observed as present there is no reason to believe habitat within the Study area would be considered as periodically occupied by the species. Habitat considered critical to the survival of the species is not considered to be present.

Potential habitat for Australian Painted Snipe within the Study area encompasses permanent waterbodies (farm dams) and to a lesser extent ephemeral waterbodies associated with gilgais. The extent of gilgai habitat has been depicted in **Figure 9** there is potentially 1,513 ha of suitable habitat within the Study area. The Project will not impact any existing farm dams. The Project layout currently proposes to impact 0.89 ha in locations in the south-east of the Study area. This represents only 0.058% of the available gilgai habitat within the Study area. At this stage it is predicted that four production wells will be drilled each year thereby limiting the overall impact at any one time.

Table 20 provides an assessment of the potential for significant impacts on Australian Painted Snipe from the Project activities using the assessment criteria for vulnerable species outlined in the MNES Guidelines.

Table 20. Significant impact criteria assessment: Australian Painted Snipe

Criteria	Endangered species assessment
Lead to a long-term decrease in the size of a population of the species	<p>The species is not known to occur within the Study area but may occur in the wider area. The species occurs as a single, sparsely distributed homogenous population across its range. If the species does occur it is only likely as transient individuals. A population will not be restricted to the Study area. The species may occur on farm dams within the Study area. It's uncertain how suitable the gilgai habitat present is for the species given the dense cover observed across much of the Project area.</p> <p>The disturbance footprint will impact a maximum area of 0.89 ha of marginally suitable gilgai habitat over the operational life of the Project. No farm dams will be impacted by Project activities. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Construction will necessarily take place in the dry season avoiding wet conditions that may be favourable to the species presence. Following well construction at a site any further disturbance will be negligible. Construction noise/vibration disturbance will be localised and temporary. Construction areas no longer required for operations will be revegetated (i.e. well sites only require 0.04 ha of cleared area for operational purposes). The Project is not considered likely to lead to a long term decrease in the size of a population of Australian Painted Snipe.</p>
Reduce the area of occupancy a population	<p>The species occurs a single, sparsely distributed homogenous population across its range. If the species does occur it is only likely as transient individuals. A population will not be restricted to the Study area. The disturbance footprint will impact a maximum area of 0.89 ha of marginally suitable gilgai habitat over the operational life of the Project. Habitat mapping indicates there is 1,513 ha of identical habitat within the overall Study area. It is predicted that four production wells will be drilled each year thereby limiting the overall extent of impact at any one time. Construction will necessarily take place in the dry season avoiding wet conditions that may be favourable to the species presence. Construction noise/vibration disturbance will be localised and temporary. The Project is not considered likely to reduce the occupancy of a population of Australian Painted Snipe.</p>
Fragment an existing population into two or more populations	<p>The species occurs a single, sparsely distributed homogenous population across its range. If the species does occur it is only likely as transient individuals. A population will not be restricted to the Study area. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The species is highly mobile. The Project will not fragment an existing population of the species.</p>
Adversely affect habitat critical to the survival of the species	<p>There is no evidence habitat critical to the survival of the species is present. No farm dams will be impacted by the Project. The disturbance footprint will impact a maximum area of 0.89 ha of marginally suitable gilgai habitat over the operational life of the Project. Habitat mapping indicates there is over 1,513 ha of identical habitat within the overall Study area. The Project is considered unlikely to affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of a population	<p>The species occurs a single, sparsely distributed homogenous population across its range. If the species does occur it is only likely as transient individuals. A population will not be restricted to the Study area. Breeding habitat is not considered to be present. The project is not considered likely to disrupt the breeding cycle of a population of the species.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	<p>The species is not known to occur within the Study area but may occur in the wider area. The species occurs as a single, sparsely distributed homogenous population across its range. If the species does occur it is only likely as transient individuals. No farm dams will be impacted by the Project. The disturbance footprint will impact a maximum area of 0.89 ha of marginally suitable gilgai habitat over the operational life of the Project. Habitat mapping indicates there is over 1,513 ha of identical habitat within the overall Study area. The Project disturbance footprint occupies scattered locations within the Study area, much of which will be revegetated following construction completion. The Project will not impact the availability or quality of habitat present to the extent the species would decline.</p>

Criteria	Endangered species assessment
Result in invasive species that are harmful to an endangered species becoming established in the endangered species habitat	Weed invasion is considered a potential threat to the species habitat. Buffel Grass occurs throughout suitable habitat areas for the species. Browsing and land degradation by cattle is considered a threat to the species habitat and is present in the Study area. Feral cat is also present and may be a predator on the species. A weed and pest management plan will be developed and implemented, including the construction and operational phases of the Project. The Project will not result in the introduction of a novel invasive species, or proliferation of an existing invasive species in the Project area or surrounds.
Introduce disease that may cause the species to decline	There are no identified introduced diseases or pathogens associated with this species. The Project activities do not require the importation of soils or other biological matters into the Project area. Machinery imported from outside the region for Project earthworks, transportation and other construction activities will be required to be certified free of weed seeds and soil matter prior to entry onsite. It is inconceivable the Project activities will result in the introduction of a disease causing the species to decline.
Interfere with the recovery of the species	<p>The Australian Painted Snipe Recovery plan identifies the following recovery objectives for Australian painted snipe:</p> <ul style="list-style-type: none"> • Manage and protect known breeding habitats at the landscape scale • Develop methods to accurately observe changes in population trajectory and measure success of recovery activities • Reduce, or eliminate threats at breeding and non-breeding habitats • Improve knowledge of the habitat requirements, biology and behaviour of Australian Painted Snipe • Engage community stakeholders to improve awareness of the conservation of Australian Painted Snipe • Coordinate, review and report on the recovery process (DEE 2020) <p>There is no conceivable reason the Project's activities would interfere with any of the recovery objectives identified above. The project's disturbance footprint with regard to potential habitat for the species is relatively minor and there is no evidence the species would occur. The Project will not interfere with the recovery of the species.</p>
Assessment result	It is uncertain if the species actually occurs within the Study area. Suitable habitat for breeding is unlikely to occur. The Project's extent of impact to potential habitat comprising gilgais is minor given the extent of habitat present within the Study area. Based on the assessment above it is considered unlikely a significant impact to Australian Painted Snipe will occur as a result of the Project.

9.1.2.4 Koala - Endangered

Ecology

Koalas have a distinct association with eucalypt woodland and forest habitats comprising suitable food trees, mainly of the following genus: Eucalyptus, Corymbia, Angophora and Melaleuca (Moore & Foley, 2000; Martin et al. 2008). They are not necessarily restricted to bushland areas and are known to occur and breed where suitable tree species occur within farmland and the urban environment (Dique et al. 2004). Similarly, movement is not confined to vegetated corridors, as they also move across cleared rural land and through suburbs (Martin et al. 2008). They may use a variety of trees, including many non-eucalypts, for feeding, shelter and breeding purposes (Dique et al. 2004; Martin et al. 2008).

They are known to have localised and variable preferences throughout their range, favouring some tree species over others (Pahl & Hume 1990). At the local level they are known to prefer individual trees. It has been suggested this could be a response to a number of factors such as high leaf moisture and/or nitrogen content, and low levels of toxic chemical compounds which are expressed by eucalypts as a result of herbivory (Pahl & Hume 1990; Hume & Esson 1993; Moore & Foley 2000).

Breeding occurs in spring / summer when males become territorial. Young permanently leave the pouch after seven months but may continue to ride on the mothers back until approximately 12 months. After this time adolescent females may remain in the natal habitat. Males generally disperse to new territories from one to three years of age (Dique et al. 2003; Martin et al. 2008).

Association with Study area

No Koalas, or signs of presence (scats or tree scratches) have been recorded within or near the Study area during the Project surveys in 2022 or 2023. There are a large number of database records in the wider area including two records (1976 and 1996) located within the Study area itself (refer **Figure 6**). Most records are older (pre 1990). The nearest recent record is from 2012 and located 17 km south-east of the Study area. In recent surveys for other projects in the area Koalas were detected approximately 7 km west and south-west of the Study area in riparian and Acacia woodlands with emergent gums (EMM 2022). In addition, Koala scats were identified along Humboldt Creek approximately 22 km south of the Study area by Golder (2018).

In the region of the Project River Red Gum is a primary, or preferred, forage tree species of Koala. Dawson Gum is considered a secondary forage species (AKF 2015). This habitat occurs along Humboldt Creek and Comet River. Remnant eucalypt woodlands occur in scattered patches within the north of the Study area (mainly on Togara). The canopy of these habitat patches is generally dominated by Poplar Box. Poplar Box is also a forage tree species for Koala, although is less preferred. The only habitat featuring the preferred forage tree species from the region (River Red Gum and Dawson Gum) impacted by the Project area is narrow strips of riparian vegetation along Humboldt Creek and Comet River.

DCCEW approved species documents

The *National recovery plan for the Koala Phascolarctos cinereus combined populations of Queensland, New South Wales and the Australian Capital Territory* (the Koala Recovery Plan) (DAWE 2022a) was approved on 8th April 2022. The Koala Recovery plan notes the following threats to the species:

- Habitat loss, fragmentation and modification including the impact of native forestry activities
- Drought, extreme heat events including associated with climate change
- Altered fire regimes
- Mortality from dog attack and vehicle collisions
- Diseases including Chlamydia and Koala retrovirus
- Plant pathogens impacting Koala habitat such as Myrtle Rust

The *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (DAWE 2022b) notes (with relevance to Queensland) the priority management actions associated with the south-east Queensland population and that sub-populations on the western edge of the species range may be ‘climate-sensitive’ and comprise genes adapted to environmental extremes which may prove critical to populations elsewhere in the future through translocation programs.

The Koala Recovery plan does not specifically identify any areas comprising ‘valued populations’ of Koala but does note an imperative to conserve populations:

- That may act as source populations to adjacent areas
- Occur in areas of climatic refugia (specifically from droughts and heat waves)
- Genetically diverse
- Contain adaptive genes to potential environmental stressors or
- Are geographical or environmental outliers

Koalas have not been observed in or near the Project area either currently or recently. The woodlands associated with the area comprise widespread communities much of which is disturbed and located within a heavily cleared landscape. There is no reason to believe this habitat would serve as a climate refuge or that a population (should one occur) would be part of a valued population.

Similarly, the Koala Recovery plan does not provide a clear description of ‘habitat critical to the survival’ of Koala. It does note that in order to halt the decline and promote recovery of the species the following activities should be avoided:

- Clearing of habitat used by Koalas
- Reducing connectivity between patches used by Koala
- Clearing habitat used during extreme events
- Avoiding activities that will expose Koalas to additional threats

The Study area is largely heavily disturbed by past vegetation clearing and there is little evidence that Koala currently uses habitat within the Study area or surrounds to any substantive degree. The Project will not erect structures that will provide an impermeable barrier to movement across the landscape. The Project will not increase additional threats to the species in the area. The Project layout avoids impacting riparian eucalypt habitat which may be considered as a refuge during drought or extreme heat events. The species has not been observed in the Project area and there is no reason to believe the habitat present would be used during an extreme heat event, or there would be habitat critical to the survival of the Koala present within the Project area or the immediate surrounds.

There is 1,470 ha of Poplar Box dominated habitat (RE 11.5.3) within the Study area. The Project gas field infrastructure proposes to impact 1.17 ha of this habitat (i.e. 0.079% of the available habitat within the Study area). This impact occurs as linear patches scattered in the east of the layout. There will be extensive tracts of identical vegetation remaining in the adjacent landscape which will not be impacted by the Project. The Project will seek to avoid impacts to preferred riparian vegetation by locating pipelines under watercourses through the application of directional drilling, where possible.

Table 21 provides an assessment of the potential for significant impacts on Koala from the Project activities using the assessment criteria for Endangered species outlined in the MNES Guidelines.

Table 21. Significant impact criteria assessment: Koala

Criteria	Endangered species assessment
Lead to a long-term decrease in the size of a population of the species	<p>The species (including any signs of presence) was not recorded within the Project area or surrounds during surveys (including spotlighting) carried out in 2022 and 2023. There are older database records located within the Study area (ALA 2023) and recent records of Koala in the wider area from other studies (Golder 2019; EMM 2022).</p> <p>Preferred forage tree species in inland Queensland includes habitat supporting River Red Gum. The gas field layout does not propose to clear such habitat. The Project will impact 1.17 ha of habitat comprising Poplar Box as the dominant canopy species. Poplar Box is less preferred for foraging in the region although Koala is known to feed on the species. There is abundant similar habitat in the surrounding area and region that will remain undisturbed. The majority of the Study area that will be impacted comprises cleared habitat sometimes with scattered regrowth Brigalow (which is not a forage tree for Koala).</p> <p>A fauna spotter is recommended to be present during vegetation clearing within suitable habitat for Koala to eliminate any potential impact on Koala individuals (should any be present at the time). Indirect impacts to Koala habitat from Project activities (such as noise, lighting and dust settlement) will be temporary and have a very minor impact at worst. The project is considered highly unlikely to lead to a long-term decrease in the size of a population of Koala.</p>
Reduce the area of occupancy a population	<p>The species is not known from the local area associated with the Project but may occur. There is no evidence the remnant vegetation associated with the Study area would support all or part of a local population of Koala. The Study area is largely cleared of remnant vegetation which may support the species. The Project proposes to clear 1.17 ha of potential habitat for Koala. This area is spread across scattered patches within the overall layout. There is abundant identical habitat located adjacent to the Project infrastructure which will remain undisturbed. Cleared habitat within the disturbance area largely comprises sparse regrowth Brigalow which does not comprise forage habitat for Koala. The project is considered highly unlikely to reduce the area of occupancy of a population of Koala.</p>
Fragment an existing population into two or more populations	<p>There is no evidence the minor area of remnant vegetation associated with the gas field layout would support all or part of a local population of Koala. The Study area is largely cleared of remnant vegetation which may support the species. The Project does not require elements that will represent a barrier to the species movement across the Study area and surrounds. The Project will not fragment an existing population of Koala.</p>

Criteria	Endangered species assessment
Adversely affect habitat critical to the survival of the species	There is no evidence habitat critical to the survival of the species is present. The gas field layout does not propose to clear riparian habitat which may be used as a refuge during drought conditions. The disturbance footprint will impact a maximum area of 1.17 ha of potentially suitable habitat over the operational life of the Project. Habitat mapping indicates there is over 1,353 ha of identical habitat within the overall Study area. The Project is considered unlikely to affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	There is no evidence the small area of remnant vegetation associated with the Project area would support all or even part of a local population of Koala. It is considered unlikely the Project will disrupt the breeding cycle of an important population of Koala.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	It is not known if the species occurs within the Project area, although suitable habitat occurs. The Project proposes to clear 1.17 ha of potential habitat for Koala. This area is spread across scattered patches within the overall layout. There is abundant identical habitat located adjacent to Project infrastructure which will remain undisturbed. The Project impacts largely occur in unsuitable grasslands, much of which will be reinstated following completion of construction. The Project will not impact the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to an endangered species becoming established in the endangered species habitat	Weed invasion is not considered a threat to the species. Feral and domestic dogs are a known threat to the species and are likely present to some degree in the landscape. Dingo was observed onsite in 2022. A weed and pest management plan will be developed and implemented, including the construction and operational phases of the Project. The Project will not result in the introduction of a novel invasive species, or proliferation of an existing invasive species in the Project area or surrounds.
Introduce disease that may cause the species to decline	Myrtle rust may impact a range of eucalypt species and may be a potential threat to habitat for Koala (DAWE 2022a). The Project activities do not require the importation of soils or other biological matters into the Project area. Machinery imported from outside the region for Project earthworks, transportation and other construction activities will be required to be certified free of weed seeds and soil matter prior to entry onsite. It is inconceivable the Project activities will result in the introduction of a disease causing the species to decline.
Interfere with the recovery of the species	<p>The Koala Recovery plan outlines a number of recovery strategies and actions for the species including the following:</p> <ul style="list-style-type: none"> • Identify nationally important populations and strategic areas for restoration, climate/fire refugia and movement corridors • Coordinate research programs including implementing a national monitoring program • Increase the area of protected Koala habitat through incorporation into State protected areas and on private lands and improve land management practises • Ensure koala conservation is integrated into policy, and statutory and land-use plans • Develop and implement strategic restoration of habitat including through natural resource management and land care groups and develop revegetation and restoration guidelines • Develop a strategy of active management practices Koala metapopulations including monitoring population health, fire management, and guidelines for managing Koala translocations and post-care release of individuals (DAWE 2022a) <p>It is uncertain to what extent the species actually occurs in the local area. The majority of the Study area has been heavily impacted by previous grazing practices. Should the species occur within or near Project works any impact will be very minor and is considered unlikely to interfere substantially with the management actions identified above or the recovery of the species.</p>
Assessment result	It is uncertain to what extent the species actually occurs within the Study area. The Project's extent of impact to potential foraging habitat comprising is very minor given the extent of habitat present elsewhere within the Study area. Based on the assessment above it is considered unlikely a significant impact to Koala will occur as a result of the Project.

9.2 Matters of State Environmental Significance Assessment

MSES are listed in Schedule 2, Section 1-12 of the Offset Regulation and are a component of the biodiversity state interest defined under the State Planning Policy (SPP). Under the QEOP Guideline (DEHP 2014), a SRI is described as an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter.

Under Queensland offsets legislation introduced in 2014, an offset condition may be imposed for SRIs to prescribed environmental matters. Prescribed environmental matters include:

- MSES
- Accredited MNES, should Queensland's offset framework receive accreditation for the purpose of the EPBC Act
- Matters of Local Environmental Significance: a matter for which an offset is required under a local planning instrument (not applicable to the Project area)

Impacts to MNES from the Project will be assessed through an EPBC Act referral to DCCEE. Where a matter listed as an MSES substantially overlaps with an MNES (e.g. species listed under both the State and Commonwealth legislation) the assessment defers to the EPBC Act assessment process and does not require consideration under the State assessment process. Six threatened fauna and three threatened flora species listed as both MNES and MSES and likely or possibly present have been addressed for the potential for significant impacts under the EPBC Act (refer Section 9.1) and are not discussed further as MSES.

The Project will be authorised to be undertaken under a site-specific EA as issued by DES and therefore, will be triggered as assessable development under the EP Act. As such, impacts to MSES require assessment against the criteria detailed in the QEOP Guideline. **Table 22** presents an assessment of the SRI resulting from the Project works on the six MSES identified as occurring in the Project area (refer **Table 4**).

Table 22. Guideline assessment (DEHP 2014) of SRI to MSES within the Project footprint

Prescribed environmental matter	Guideline criteria	Assessment outcome
Wetlands in a wetland protection area or wetlands of high ecological significance as listed under the Environmental Protection Regulation 2019	Assessed under relevant significant impact assessment criteria (refer DEHP 2014)	The Project footprint intersects the 500 m buffer zone applied to a wetland protection area. Nevertheless, the project footprint is located <200 m away from the wetland protection area in line with the <i>streamlined model conditions for petroleum activities</i> (ESR/2016/1989, Versions 2.02, 07 May 2016). No SRI expected
Protected wildlife habitat for species listed as threatened or special least concern (NC Act) fauna or flora as listed under the NC Animals Regulation/NC Flora Regulation	Species assessed under relevant significant impact assessment criteria (refer DEHP 2014) where necessary.	The Project footprint provides likely or known habitat for several flora and fauna species listed as threatened under the NC Act (refer Table 8 and Table 10). The majority of these have been assessed for significant impacts under the EPBC Act in Section 9.1 . The Project footprint will intersect potential habitat for the following species listed only under the NC Act: <ul style="list-style-type: none"> • Short-beaked Echidna - special least concern • <i>Solanum elaeagnifolium</i> - endangered Impacts to these species are assessed under the relevant impact criteria in Section 9.2.1 . No SRI expected
Category B (remnant) areas on the regulated vegetation management map, that are	Clearing for linear infrastructure: <ul style="list-style-type: none"> • Greater than 25 m wide in a grassland (structural category) RE; or 	Clearing of remnant or regrowth vegetation communities has been avoided by refining the Project design. No SRI expected

Prescribed environmental matter	Guideline criteria	Assessment outcome
'endangered' and 'of concern' regional ecosystems	<ul style="list-style-type: none"> 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. 	
Regulated vegetation located within a defined distance from the defining banks of a relevant watercourse identified on the VM Act watercourse and drainage feature map	Clearing for non-linear infrastructure (such as well pads): <ul style="list-style-type: none"> Area greater than 5 ha where in a grassland (structural category) RE; or Area greater than 2 ha where in a sparse (structural category) RE; or Area greater than 0.5 ha where in a dense to mid-dense (structural category) RE. 	The defined distances for relevant watercourses in the Project area are as follows: <ul style="list-style-type: none"> Stream order 1 and 2 - 25 m Stream order 3 and 4 – 50 m Stream order 5 and 6 – 100 m Clearing for the Project gas field layout for non-linear infrastructure will not occur within 5 m of the defining bank of a relevant watercourse or drainage line. Clearing for linear infrastructure (gathering flow line) has been designed to avoid watercourse vegetation.
Regulated vegetation management located within a wetland or within 100 metres from the defining bank of a wetland identified on the VM Act wetlands map		No SRI expected No areas of regulated vegetation within 100 m of a mapped VM Act wetland are intersected by the Project.
Essential habitat on the essential habitat map for wildlife prescribed as critically endangered, endangered or vulnerable under the NC Act	Species assessed under relevant significant impact assessment criteria (refer DEHP 2014) where necessary.	Clearing of essential habitat for Ornamental Snake (vulnerable under the NC Act). has been avoided by refining the Project design.
Connectivity areas	Assessed using DES' landscape fragmentation and connectivity tool' (refer Appendix D for output results)	No SRI expected

9.2.1 MSES Significant Impact Assessment – Conservation Significant Species

There are two species listed only as MSES and considered as known to occur, or possibly occurring within the Project area that may be potentially impacted by the Project activities:

- Known to occur:
 - Short-beaked Echidna – SLC
 - Solanum elaeagnifolium* – Endangered

The potential for the Project activities to cause SRIs to these species area assessed in the following tables as per the relevant impact criteria detailed in the QEOP Guideline.

Table 23. MSES SRI criteria assessment (SLC species): Short-beaked Echidna

Criteria	Species assessment
Lead to a long term decrease in the size of a local population	Short-beaked Echidna was recorded as an incidental observation during the targeted fauna survey in January-February 2023. The species is dispersed across the entire continent and there are no subpopulations noted on mainland Australia. A local population is very unlikely to be restricted to the Project area. The species forages on termites and ants. The species may occur in wooded and disturbed habitats although woodlands provide better quality habitat for foraging and cover than pasture lands (Sprent & Nicol 2012). Habitat disturbance within the Project footprint will largely be linear for the pipeline infrastructure. The disturbance footprint is surrounded by habitats with identical habitat values which will not be disturbed by the Project. Pre-clearance surveys will ensure injury/mortality risks to individuals will be minimised. The Project is unlikely to lead to a long-term decrease of a local population.

Criteria	Species assessment
Reduce the extent of occurrence of a species	The species population is dispersed across the entire continent and may occur in cleared lands. The Project footprint is immediately surrounded by lands with identical habitat values which will not be disturbed by the Project. The Project is unlikely to reduce the extent of occurrence of the species.
Fragment an existing population	The species population is dispersed across the entire continent and may occur in cleared lands. A local population is very unlikely to be restricted to the Project area. Vegetation clearing associated with the Project is largely linear (18 m wide) and is not considered likely to fragment any existing population.
Result in genetically distinct population forming as a result of habitat isolation	The species population is dispersed across the entire continent and may occur in cleared lands. A local population is very unlikely to be restricted to the Project area. Vegetation clearing associated with the Project is largely linear (18 m wide) and is not considered likely to fragment or isolate any existing population.
Cause disruption to ecologically significant locations	Vegetation clearing for the Project is almost entirely within cleared lands which are much less likely to support foraging or resting locations. Mitigation measures during clearing will reduce the potential for direct adverse impacts on individuals and will include measures such as pre-clearing habitat inspections where woodland with woody debris (therefore potential resting sites) occurs. The Project footprint is surrounded by lands with identical habitat values which will not be disturbed by the Project. The Project is unlikely to disrupt an ecologically significant location for the species.
Assessment result	No significant residual Project impacts are considered likely to occur to the Short-beaked echidna. The species ranges widely across the Australian mainland and there is no evidence the Project area would exclusively support a population of the species. There is extensive identical habitat that would support Short-beaked echidna in the immediate surrounds of any Project infrastructure.

Table 24. MSES SRI criteria assessment (vulnerable or endangered): *Solanum elachophyllum*

Criteria	Species assessment
Lead to a long term decrease in the size of a local population	This is a small shrub growing up to 0.4 m in height. In the region it is known to occur in Brigalow communities with Dawson Gum or <i>Eucalyptus thozetiana</i> (DES 2022d). The species has been recorded within the eastern portion of the Study area. A total of 256 individuals of the species were identified across five locations within the Study area during 2019 (EMM 2022). The individuals were identified in vegetation ground-truthed as RE 11.4.8. None of these locations, or the vegetation tract they were identified in, or identified individuals will be directly impacted by the Project. The species has not been identified within proposed Project impact areas. The Project has been refined to avoid any areas of Brigalow vegetation. The Project is considered unlikely to lead to a long term decrease in the size of a local population.
Reduce the extent of occurrence of a species	The extent of occurrence (EOO) of the species extends from Moranbah to Theodore (DES 2022d). The Project has been refined to avoid any areas of Brigalow vegetation. Known populations of the species will not be directly or indirectly impacted. The Project impact extent is minor and is considered unlikely to reduce the extent of occurrence of the species.
Fragment an existing population	The species has been recorded within the eastern portion of the Study area. A total of 256 individuals of the species were identified across five locations within the Study area during 2019 (EMM 2022). The individuals were identified in vegetation ground-truthed as RE 11.4.8. None of these locations, or the vegetation tract they were identified in, or identified individuals will be directly impacted by the Project. The species has not been identified within proposed Project impact areas. The Project will not form a barrier to dispersal for the species. The Project is not likely to fragment an existing population of the species.
Result in genetically distinct population forming as a result of habitat isolation	The species has been recorded within the eastern portion of the Study area. A total of 256 individuals of the species were identified across five locations within the Study area during 2019 (EMM 2022). The individuals were identified in vegetation ground-truthed as RE 11.4.8. None of these locations, or the vegetation tract they were identified in, or identified individuals will be directly, or indirectly impacted by the Project. The species has not been identified within proposed Project impact areas. The

Criteria	Species assessment
	Project will not form a barrier to dispersal for the species. The Project is unlikely to result in genetically distinct populations forming as a result of habitat isolation.
Result in the establishment of an invasive species that is harmful to the threatened species	Invasion by introduced pasture grasses is a known threatening process for <i>Solanum elachophyllum</i> (DES 2022d). Introduced pasture grasses such as Buffel Grass already occur in high density across the Study area. A weed and pest management plan will be developed and implemented, including the construction and operational phases of the Project. The Project is unlikely to result in the establishment of an invasive species that is harmful to the threatened species.
Introduce disease that may cause a population to decline	There are no identified introduced diseases or pathogens associated with this species. The Project activities do not require the importation of soils or other biological matters into the Project area. Machinery imported from outside the region for Project earthworks, transportation and other construction activities will be required to be certified free of weed seeds and soil matter prior to entry onsite. It is inconceivable the Project activities will result in the introduction of a disease causing the species to decline.
Interfere with the recovery of a species	There are no specific management recommendations for the species. Monitoring of known populations and surveys to identify additional populations is recommended within Taunton National Park (DES 2022d). While the species has been recorded previously within the Study area the Project will not impact the area or vegetation the species was recorded in. There is no conceivable reason the Project's activities would interfere with recommendations identified above. The project's disturbance footprint with regard to potential habitat for the species is relatively minor. The Project will not interfere with the recovery of the species.
Cause disruption to ecologically significant locations	The species has been recorded within the eastern portion of the Study area. A total of 256 individuals of the species were identified across five locations within the Study area during 2019 (EMM 2022). The individuals were identified in vegetation ground-truthed as RE 11.4.8. None of these locations, or the vegetation tract they were identified in, or identified individuals will be directly impacted by the Project. The species has not been identified within proposed Project impact areas. An ecologically significant location for the species is unlikely to be impacted by the Project. The Project is unlikely to cause disruption of to ecologically significant locations.
Assessment result	The project will not impact any of the known locations or associated tract of vegetation located within the Study area. Clearing of potentially suitable vegetation for the Project is minor. A SRI on <i>Solanum elachophyllum</i> resulting from the Project is considered unlikely.

9.3 Significant Residual Impacts - Environmental Offsets

Based on the SRI assessments for MNES and MSES detailed in the previous sections associated with the potential impacts of the Project, there are no predicted impacts to environmental values potentially requiring environmental offsets.

10 CONCLUSION

Comet Ridge is proposing to develop a greenfield CSG plant and well infrastructure contained within ATP2048. The Project will comprise 68 CSG wells (34 production wells and 34 lateral wells). The Project area is situated in central Queensland approximately 42 km north of Rolleston, 45 km south of Comet and lies within the Central Highlands Regional Council area. The project will require the development of the CSG production wells, connecting water and gas flow lines, a gas and water processing facility and ancillary infrastructure.

The overall Study area covers 14,078 ha, of which the majority (over 85 %) has been cleared for cattle grazing and cropping. Remnant vegetation is located largely in the northern section of the Study area on Togara property. Topography is relatively flat undulating downs, descending from the higher alluvial areas on the eastern boundary to the alluvial flats associated with the Comet River. The Project is located within the Comet River catchment which is part of the Fitzroy River Basin.

Desktop review and field surveys (carried out in 2022 and 2023) were carried out to characterise the terrestrial ecological values associated with the Project and immediate surrounds. The flora survey identified seven REs within the Study area based on site surveys and analysis of aerial imagery. There are five REs comprising Brigalow communities listed as Endangered under the EP Act present. The majority of vegetation is listed as No Concern under the EP Act. There are substantial differences with the current State Government RE mapping which overstates the potential extent of Brigalow communities present within the Study area. One EPBC Act listed TEC is considered present as scattered patches throughout the Study area. No threatened flora species were observed during the Project surveys. Nevertheless, one species is known to be present based on previous recent surveys for a different project encompassing the Study area (*Solanum elaeagnifolium* – endangered – NC Act). Annual Wiregrass is considered likely to be present (Vulnerable - EPBC Act and NC Act) and two other threatened flora species have some potential to occur.

State mapping for threatened fauna species indicates there is habitat for Ornamental Snake (Vulnerable – EPBC Act and NC Act) within the Project area. No threatened or migratory species were recorded during site surveys for the Project. Short-beaked echidna is listed as SLC under the NC Act and was recorded during the Project surveys. Ornamental Snake has been recorded to the east and south-east of the Study area and is considered likely to occur based on the presence of suitable gilgai habitat. Koala is also considered likely to occur based on older database records located within the Study area and the presence of suitable habitat. The Project area provides possible habitat for a further six threatened species and six migratory bird species.

In general, impacts resulting from Project activities will be very minor and likely restricted to the construction phase. Project infrastructure has been located away from sensitive ecological values as much as is feasible. The current Project layout of gas field infrastructure has been substantially revised and is predicted to impact only 1.17 ha of Poplar Box woodland through vegetation clearing. The Project will also impact 0.89 ha of cleared habitat comprising gulgais which may provide potential habitat for threatened species (Ornamental Snake in particular). The majority of the clearing impact will be restricted to narrow linear areas associated with the gathering flow line disturbance area and clearing for well pads. Any potential indirect impacts to adjacent fauna/flora habitat from the Project are expected to be minimised through a range of mitigation measures applied under the project CEMP and OEMP.

The Project's impacts to Environmental Values were subject to a risk assessment analysis and assessment for significant impacts under State and Commonwealth guidelines. The Project was assessed as avoiding the potential to cause SRIs to any MNES or MSES identified as potentially occurring in the Study area.

11 ACRONYMS AND GLOSSARY

AHD	Australian Height Datum
ALA	Atlas of Living Australia
ANZECC	Australian and New Zealand Environment and Conservation Council
ATP2048	Authority to Prospect 2048
BBNB	Brigalow Belt North Bioregion
Biosecurity Act	<i>Biosecurity Act 2014</i>
Bonn Convention	Convention on the Conservation of Migratory Species of Wild Animals
CAMBA	China-Australia Migratory Bird Agreement
CEMP	Construction Environmental Management Plan
Coal seam gas	CSG
Comet Ridge	Comet Ridge Mahalo North Pty Ltd
DAF	Department of Agriculture and Fisheries
DCCEEW	Commonwealth Department of Climate Change, Energy, Environment and Water
DES	Department of Environment and Science
DoR	Department of Resources
EA	Environmental Authority
EDL	Ecologically dominant layer
EOO	Extent of occurrence
EOP	<i>Environmental Offsets Policy October 2012 (Commonwealth)</i>
End Of Waste Code	End Of Waste Code
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERAs	Environmentally Relevant Activities
ESA	Environmentally Sensitive Areas
ESCP	Erosion and Sediment Control Plan
Fisheries Act	<i>Fisheries Act 1994</i>
GBO	General biosecurity obligation
GCF	Gas compression facility
Ha	hectares
HES	high ecological significance
JAMBA	Japan-Australia Migratory Bird Agreement
Koala Recovery Plan	<i>National recovery plan for the Koala Phascolarctos cinereus combined populations of Queensland, New South Wales and the Australian Capital Territory</i>
km	Kilometres
L	Litres
m	metres
mm	millimetres
ML	Megalitres
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	<i>Nature Conservation Act 1992</i>
NSW	New South Wales
OEMP	Operation Environmental Management Plan
Offsets Act	<i>Environmental Offsets Act 2014</i>
Offsets Regulation	<i>Environmental Offsets Regulation 2014</i>
PMR	Protected Matters Report
PMST	Protected Matters Search Tool
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
PEM	Prescribed Environmental Matters

PPL	Petroleum Pipeline Lease
QEOP Guideline	Queensland Environmental Offsets Policy Significant Residual Impact Guideline
QFES	Queensland Fire and Emergency Services
RE	Regional Ecosystems
Australian Painted Snipe Recovery plan	<i>Draft national recovery plan for the Australian Painted Snipe</i>
Referral guidelines	<i>Draft referral guidelines for the nationally listed Brigalow Belt reptiles</i>
SIS	Surface to in-seam
SPP	State Planning Policy
SRI	Significant residual impact
TEC	Threatened Ecological Communities
the Project	A greenfield coal seam gas plant and well infrastructure contained within Authority to Prospect 2048
the Study area	Project gas field area confined to ATP2048 (14,078 ha), which represents 45 sub-blocks
WildNet	Queensland Government Wildlife Online
WoNS	Weeds of National Significance

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13 LIMITATIONS

Epic Environmental Pty Ltd (Epic) has prepared the following report for the exclusive benefit of Comet Ridge Mahalo North Pty Ltd (Client) and for the singular purpose of providing an ecological assessment and Ecological Assessment Report of the proposed Mahalo North Development Area. All interpretations, findings or recommendations outlined in this report should be read and relied upon only in the context of the report as a whole.

The following report cannot be relied upon for any other purpose, at any other location or for the benefit of any other person, without the prior written consent of Epic. Except with Epic's prior written consent, this report may not be:

- a. released to any other person, whether in whole or in part;
- b. used or relied upon by any other party; or
- c. filed with any Governmental agency or other person or quoted or referred to in any public document.

This report has been prepared based on information provided by the Client and other parties. In preparing this report Epic:

- a. presumed the accuracy of the information provided by the Client (including its representatives);
- b. has not undertaken any verification to the accuracy or reliability included in this information (with the exception where such verification formed part of the scope of works);
- c. has not undertaken any independent investigations or enquiries outside the scope of works with respect to information provided for this report; and
- d. provides no warranty or guarantee, expressed or implied, as to the accuracy or reliability of the information provided in this report.

In recognition of the limited use of this report, the Client agrees that, to the maximum extent permitted by law, Epic (including its representatives and related entities) is not liable for any losses, claims, costs, expenses, damages (whether pursuant to statute, in contract or tort, for negligence or otherwise) suffered or incurred by the Client or any third party as a result of the information, findings, opinions, estimates, recommendations and conclusions provided in this report.

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- c. where another person has a different interpretation of the same information contained in the report;
- d. for any consequential or indirect losses, or for loss of profit or goodwill or any loss or corruption of any data, database or software.

If a section of this disclaimer is determined by any court or other competent authority to be unlawful and/or unenforceable, the other sections of this disclaimer continue in effect. Where further information becomes available, or additional assumptions need to be made, Epic reserves its right to amend this report, but is not obliged to do so.



Project name: Mahalo North Coal Seam Gas Project

APPENDIX A DESKTOP SEARCH RESULTS





Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 20-Jan-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	26
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[[Resource Information](#)]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area

PLANT

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aristida annua [17906]	Vulnerable	Species or species habitat known to occur within area	In feature area
Bertya opposens [13792]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat may occur within area	In feature area
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat may occur within area	In feature area
Leichhardtia brevifolia listed as Marsdenia brevifolia [91893]	Vulnerable	Species or species habitat may occur within area	In feature area
Solanum dissectum [75720]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [[Resource Information](#)]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species

Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area

Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Blackwater Mine South Coking Coal Project	2022/09279		Assessment	In feature area
rail track to link the proposed MIM Rolleston coal mine to existing rail network	2002/637		Post-Approval	In buffer area only
Controlled action				
Arcturus Coal Project; A combined open cut and underground longwall coal mine	2010/5783	Controlled Action	Completed	In buffer area only
Coal Seam Gas Field Development for Natural Gas Liquefaction Park, Curtis Island	2008/4059	Controlled Action	Completed	In feature area
Springsure Creek Coal Project	2010/5782	Controlled Action	Post-Approval	In feature area
ZeroGen Integrated Gasification Combined Cycle Power Plant and CO2 Capture, Transport and Storage	2009/5195	Controlled Action	Completed	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Mahalo Development Area CSG Project	2019/8534	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Blackwater to Rolleston 132 kV transmission line	2002/880	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
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- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

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

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Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111



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: -24.0489
Longitude: 148.6281
Distance: 50
Email: orobertson@epicenvironmental.com.au
Date submitted: Friday 20 Jan 2023 13:42:35
Date extracted: Friday 20 Jan 2023 13:50:03

The number of records retrieved = 1717

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufo	<i>Rhinella marina</i>	cane toad	Y			49
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		14/2
animals	amphibians	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog		C		1/1
animals	amphibians	Hylidae	<i>Cyclorana cultripes</i>	grassland collared frog		C		3
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		8
animals	amphibians	Hylidae	<i>Cyclorana platycephala</i>	water holding frog		C		1
animals	amphibians	Hylidae	<i>Cyclorana sp.</i>			C		1
animals	amphibians	Hylidae	<i>Cyclorana verrucosa</i>	rough collared frog		C		4/4
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		26
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		3
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		4
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		44
animals	amphibians	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog		C		8
animals	amphibians	Hylidae	<i>Litoria rothii</i>	northern laughing treefrog		C		1
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		21
animals	amphibians	Limnodynastidae	<i>Adelotus brevis</i>	tusked frog		V		2
animals	amphibians	Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog		C		8
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		26/2
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		43
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		18
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		8
animals	amphibians	Myobatrachidae	<i>Crinia parinsignifera</i>	beeping froglet		C		12/1
animals	amphibians	Myobatrachidae	<i>Pseudophryne major</i>	great brown broodfrog		C		9/2
animals	amphibians	Myobatrachidae	<i>Pseudophryne sp.</i>			C		2
animals	amphibians	Myobatrachidae	<i>Uperoleia laevigata</i>	eastern gungan		C		3
animals	amphibians	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan		C		2
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		5
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		4
animals	birds	Acanthizidae	<i>Acanthiza lineata</i>	striated thornbill		C		3
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		4
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		3
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		17/1
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		2
animals	birds	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone		C		1
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		27
animals	birds	Acanthizidae	<i>Pyrrholaemus sagittatus</i>	speckled warbler		C		3
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		8
animals	birds	Acanthizidae	<i>Smicromis brevirostris</i>	weebill		C		29
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		2
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		5
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		13
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		2
animals	birds	Accipitridae	<i>Circus assimilis</i>	spotted harrier		C		4
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		14
animals	birds	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk		E	V	1
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		29
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		12
animals	birds	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler		C		3
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		33
animals	birds	Alaudidae	<i>Mirafra javanica</i>	Horsfield's bushlark		C		26
animals	birds	Alcedinidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		8
animals	birds	Alcedinidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		63
animals	birds	Alcedinidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		7
animals	birds	Alcedinidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		2
animals	birds	Alcedinidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		28
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		7
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		28
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		7
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		5
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		2
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		1
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		9
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		7
animals	birds	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret		C		9
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		4
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		5
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		12
animals	birds	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron		C		5
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		14
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		6
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		3
animals	birds	Artamidae	<i>Artamus personatus</i>	masked woodswallow		C		3
animals	birds	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow		C		3
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	piebald butcherbird		C		57
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		57
animals	birds	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		76
animals	birds	Artamidae	<i>Strepera graculina</i>	piebald currawong		C		35/3
animals	birds	Artamidae	<i>Strepera graculina graculina</i>	piebald currawong (eastern Australia)		C		4
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		3
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		58
animals	birds	Cacatuidae	<i>Calyptorhynchus lathami</i>	glossy black-cockatoo		V		4
animals	birds	Cacatuidae	<i>Calyptorhynchus lathami erebus</i>	glossy black-cockatoo (northern)		V		1/1
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		39
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		27
animals	birds	Cacatuidae	<i>Zanda funerea</i>	yellow-tailed black-cockatoo		C		4
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		4
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		46
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		9
animals	birds	Campephagidae	<i>Edolisoma tenuirostre</i>	common cicadabird		C		12
animals	birds	Campephagidae	<i>Lalage tricolor</i>	white-winged triller		C		8
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		13

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Charadriidae	<i>Elseyornis melanops</i>	black-fronted dotterel		C		3
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		9
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		3
animals	birds	Charadriidae	<i>Vanellus tricolor</i>	banded lapwing		C		1
animals	birds	Cinclosomatidae	<i>Cinclosoma punctatum</i>	spotted quail-thrush		C		4
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		28
animals	birds	Climacteridae	<i>Climacteris picumnus</i>	brown treecreeper		C		1
animals	birds	Climacteridae	<i>Cormobates leucophaea</i>	white-throated treecreeper		C		8
animals	birds	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)		C		14/7
animals	birds	Columbidae	<i>Geopelia cuneata</i>	diamond dove		C		2
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		24
animals	birds	Columbidae	<i>Geopelia placida</i>	peaceful dove		C		34
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		50
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		7
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		23
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		11
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		44
animals	birds	Corvidae	<i>Corvus bennetti</i>	little crow		C		1
animals	birds	Corvidae	<i>Corvus coronoides</i>	Australian raven		C		35
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		79
animals	birds	Corvidae	<i>Corvus sp.</i>			C		1
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		7
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		7
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		8
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		49
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		5
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		4
animals	birds	Cuculidae	<i>Chalcites minutillus</i>	little bronze-cuckoo		C		2
animals	birds	Cuculidae	<i>Chalcites minutillus barnardi</i>	Eastern little bronze-cuckoo		C		4
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		12
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		22
animals	birds	Dicaeidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		41
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		3
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		7
animals	birds	Estrildidae	<i>Neochmia modesta</i>	plum-headed finch		C		2
animals	birds	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch		C		3
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		52
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		9
animals	birds	Eurostopodidae	<i>Eurostopodus argus</i>	spotted nightjar		C		1
animals	birds	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar		C		2
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		19
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		28
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		5
animals	birds	Falconidae	<i>Falco peregrinus macropus</i>	Australian peregrine falcon		C		1
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Falconidae	<i>Falcunculus frontatus</i>	crested shrike-tit		C		1
animals	birds	Glareolidae	<i>Stiltia isabella</i>	Australian pratincole		C		1
animals	birds	Gruidae	<i>Antigone rubicunda</i>	broilga		C		6
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		7
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		4
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		12
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		1
animals	birds	Laridae	<i>Chlidonias hybrida</i>	whiskered tern		C		4
animals	birds	Laridae	<i>Gelochelidon nilotica</i>	gull-billed tern		SL		4
animals	birds	Laridae	<i>Hydroprogne caspia</i>	Caspian tern		SL		6
animals	birds	Locustellidae	<i>Cincloramphus cruralis</i>	brown songlark		C		6
animals	birds	Locustellidae	<i>Cincloramphus mathewsi</i>	rufous songlark		C		1
animals	birds	Locustellidae	<i>Cincloramphus timoriensis</i>	tawny grassbird		C		13
animals	birds	Maluridae	<i>Malurus assimilis</i>	purple-backed fairy-wren		C		9
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		10
animals	birds	Maluridae	<i>Malurus lamberti sensu lato</i>	variegated fairy-wren		C		4/1
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		70
animals	birds	Maluridae	<i>Malurus sp.</i>			C		1
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		1
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		4
animals	birds	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill		C		4/1
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		15/4
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		30
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		17
animals	birds	Meliphagidae	<i>Lichenostomus melanops</i>	yellow-tufted honeyeater		C		3
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		8
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		50
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		40
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		5
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		17
animals	birds	Meliphagidae	<i>Melithreptus brevirostris</i>	brown-headed honeyeater		C		3
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	<i>Melithreptus gularis gularis</i>	black-chinned honeyeater (eastern)		C		1
animals	birds	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater		C		21/4
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		1
animals	birds	Meliphagidae	<i>Nesoptilotis leucotis</i>	white-eared honeyeater		C		16
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		29
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		58/3
animals	birds	Meliphagidae	<i>Phylidonyris niger</i>	white-cheeked honeyeater		C		2
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		22
animals	birds	Meliphagidae	<i>Ptilotula fusca</i>	fuscous honeyeater		C		4
animals	birds	Meliphagidae	<i>Ptilotula penicillata</i>	white-plumed honeyeater		C		2
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		10
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		50
animals	birds	Monarchidae	<i>Myiagra alecto</i>	shining flycatcher		C		1
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		24
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		8
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		5
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		29
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		4
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		23
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		24
animals	birds	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		C		2
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		3/1
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		45
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		8/2
animals	birds	Pardalotidae	<i>Pardalotus rubricatus</i>	red-browed pardalote		C		2
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		63
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		5
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		15/4
animals	birds	Petroicidae	<i>Microeca fascinans</i>	jacky winter		C		10/2
animals	birds	Petroicidae	<i>Petroica goodenovii</i>	red-capped robin		C		2
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		7
animals	birds	Phalacrocoracidae	<i>Phalacrocorax carbo</i>	great cormorant		C		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		4
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		1
animals	birds	Phasianidae	<i>Synoicus ypsilophorus</i>	brown quail		C		30
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		14
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		9
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		19
animals	birds	Psittaculidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		7
animals	birds	Psittaculidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		45
animals	birds	Psittaculidae	<i>Melopsittacus undulatus</i>	budgerigar		C		8
animals	birds	Psittaculidae	<i>Parvipsitta pusilla</i>	little lorikeet		C		9
animals	birds	Psittaculidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		80/1
animals	birds	Psittaculidae	<i>Psephotus haematonotus</i>	red-rumped parrot		C		1
animals	birds	Psittaculidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		9
animals	birds	Psittaculidae	<i>Trichoglossus moluccanus</i>	rainbow lorikeet		C		58/4
animals	birds	Ptilonorhynchidae	<i>Chlamydera maculata</i>	spotted bowerbird		C		17
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	birds	Recurvirostridae	<i>Himantopus leucocephalus</i>	pied stilt		C		5
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		26/1
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		53
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		1
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		17
animals	birds	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill		C		3
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		2
animals	birds	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis		SL		1
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		3
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		4
animals	birds	Turnicidae	<i>Turnix varius</i>	painted button-quail		C		1

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animals	birds	Tytonidae	<i>Tyto javanica</i>	eastern barn owl		C		9
animals	birds	Tytonidae	<i>Tyto longimembris</i>	eastern grass owl		C		1
animals	birds	Zosteropidae	<i>Zosterops lateralis</i>	silveryeye		C		14
animals	insects	Hesperiidae	<i>Badamia exclamationis</i>	narrow-winged awl				1
animals	insects	Hesperiidae	<i>Cephrenes augiades sperthias</i>	orange palm-dart				1
animals	insects	Hesperiidae	<i>Hesperilla furva</i>	grey sedge-skipper				2
animals	insects	Hesperiidae	<i>Hesperilla malindeva</i>	two-spotted sedge-skipper				1
animals	insects	Hesperiidae	<i>Hesperilla ornata ornata</i>	spotted sedge-skipper (southern subspecies)				1
animals	insects	Hesperiidae	<i>Mesodina halyzia</i>	eastern iris-skipper				1
animals	insects	Hesperiidae	<i>Ocybadistes hypomeloma hypomeloma</i>	white-margined grass-dart (eastern subspecies)				1
animals	insects	Hesperiidae	<i>Ocybadistes walkeri sothis</i>	green grass-dart				2
animals	insects	Hesperiidae	<i>Parnara bada</i>	grey swift				1
animals	insects	Hesperiidae	<i>Toxidia peron</i>	dingy grass-skipper				1
animals	insects	Hesperiidae	<i>Trapezites eliena</i>	orange ochre				1
animals	insects	Hesperiidae	<i>Trapezites maheta</i>	northern silver ochre				1
animals	insects	Hesperiidae	<i>Trapezites phigalia</i>	heath ochre				1
animals	insects	Hesperiidae	<i>Trapezites taori</i>	sandstone ochre				1
animals	insects	Libellulidae	<i>Orthetrum caledonicum</i>	blue skimmer				1
animals	insects	Lycaenidae	<i>Candalides cyprotus pallescens</i>	copper pencilled-blue				1
animals	insects	Lycaenidae	<i>Candalides geminus</i>	twin dusky-blue				1
animals	insects	Lycaenidae	<i>Euchrysops cnejus cnidus</i>	spotted pea-blue				1
animals	insects	Lycaenidae	<i>Lampides boeticus</i>	long-tailed pea-blue				1
animals	insects	Lycaenidae	<i>Nacaduba biocellata biocellata</i>	two-spotted line-blue				2
animals	insects	Lycaenidae	<i>Neolucia agricola agricola</i>	fringed heath-blue				1
animals	insects	Lycaenidae	<i>Nesolycaena albosericea</i>	satin opal				1
animals	insects	Lycaenidae	<i>Theclinesthes miskini miskini</i>	wattle blue (Australian subspecies)				1
animals	insects	Lycaenidae	<i>Zizeeria karsandra</i>	spotted grass-blue				1
animals	insects	Lycaenidae	<i>Zizina otis labradus</i>	common grass-blue (Australian subspecies)				2
animals	insects	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing				2
animals	insects	Nymphalidae	<i>Charaxes sempronius sempronius</i>	tailed emperor				1
animals	insects	Nymphalidae	<i>Danaus petilia</i>	lesser wanderer				4
animals	insects	Nymphalidae	<i>Euploea corinna</i>	common crow				17
animals	insects	Nymphalidae	<i>Hypocysta adiante adiante</i>	orange ringlet				3
animals	insects	Nymphalidae	<i>Hypocysta irius</i>	orange-streaked ringlet				1
animals	insects	Nymphalidae	<i>Hypocysta metirius</i>	brown ringlet				1
animals	insects	Nymphalidae	<i>Hypocysta pseudirius</i>	grey ringlet				2
animals	insects	Nymphalidae	<i>Hypocysta sp.</i>					1
animals	insects	Nymphalidae	<i>Junonia orithya albicincta</i>	blue argus				2
animals	insects	Nymphalidae	<i>Junonia villida villida</i>	meadow argus				5
animals	insects	Nymphalidae	<i>Melanitis leda bankia</i>	evening brown				4
animals	insects	Nymphalidae	<i>Tirumala hamata hamata</i>	blue tiger				2
animals	insects	Nymphalidae	<i>Vanessa kershawi</i>	Australian painted lady				1
animals	insects	Nymphalidae	<i>Ypthima arctous arctous</i>	dusky knight				1

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animals	insects	Papilionidae	<i>Cressida cressida cressida</i>	clearwing swallowtail				2	
animals	insects	Papilionidae	<i>Graphium eurypylus lycaon</i>	pale triangle				1	
animals	insects	Papilionidae	<i>Papilio aegaeus aegaeus</i>	orchard swallowtail (Australian subspecies)				4	
animals	insects	Papilionidae	<i>Papilio anactus</i>	dainty swallowtail				1	
animals	insects	Papilionidae	<i>Papilio demoleus sthenelus</i>	chequered swallowtail				1	
animals	insects	Pieridae	<i>Appias paulina ega</i>	yellow albatross				1	
animals	insects	Pieridae	<i>Belenois java teutonia</i>	caper white				4	
animals	insects	Pieridae	<i>Catopsilia gorgophone gorgophone</i>	yellow migrant				2	
animals	insects	Pieridae	<i>Catopsilia pomona</i>	lemon migrant				3	
animals	insects	Pieridae	<i>Cepora perimale scyllara</i>	caper gull (Australian subspecies)				1	
animals	insects	Pieridae	<i>Delias argenthona argenthona</i>	scarlet jezebel				2	
animals	insects	Pieridae	<i>Elodina angulipennis</i>	southern pearl-white				2	
animals	insects	Pieridae	<i>Elodina parthia</i>	striated pearl-white				1	
animals	insects	Pieridae	<i>Eurema hecabe</i>	large grass-yellow				1	
animals	insects	Pieridae	<i>Eurema herla</i>	pink grass-yellow				1	
animals	insects	Pieridae	<i>Eurema smilax</i>	small grass-yellow				1	
animals	malacostracans	Parastacidae	<i>Cherax quadricarinatus</i>	redclaw				1	
animals	mammals	Bovidae	<i>Bos sp.</i>	cattle	Y			4	
animals	mammals	Bovidae	<i>Bos taurus</i>	European cattle	Y			3	
animals	mammals	Canidae	<i>Canis familiaris</i>	dog	Y			16	
animals	mammals	Canidae	<i>Canis familiaris (dingo)</i>	dingo				3	
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			2	
animals	mammals	Dasyuridae	<i>Antechinus flavipes flavipes</i>	yellow-footed antechinus (south-east Queensland)			C	1	
animals	mammals	Dasyuridae	<i>Planigale ingrami</i>	long-tailed planigale			C	3/1	
animals	mammals	Dasyuridae	<i>Planigale tenuirostris</i>	narrow-nosed planigale			C	13	
animals	mammals	Dasyuridae	<i>Sminthopsis macroura</i>	stripe-faced dunnart			C	15	
animals	mammals	Dasyuridae	<i>Sminthopsis murina</i>	common dunnart			C	1	
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat			C	7	
animals	mammals	Equidae	<i>Equus caballus</i>	horse	Y			1	
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			13	
animals	mammals	Leporidae	<i>Lepus europaeus</i>	European brown hare	Y			3	
animals	mammals	Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	Y			11	
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo			C	26	
animals	mammals	Macropodidae	<i>Notamacropus dorsalis</i>	black-striped wallaby			C	1	
animals	mammals	Macropodidae	<i>Notamacropus parryi</i>	whiptail wallaby			C	5	
animals	mammals	Macropodidae	<i>Notamacropus rufogriseus</i>	red-necked wallaby			C	1	
animals	mammals	Macropodidae	<i>Onychogalea frenata</i>	bridled nailtail wallaby			E	E	1
animals	mammals	Macropodidae	<i>Osphranter robustus</i>	common wallaroo			C	4	
animals	mammals	Macropodidae	<i>Petrogale herberti</i>	Herbert's rock-wallaby			C	3/3	
animals	mammals	Macropodidae	<i>Petrogale inornata</i>	unadorned rock-wallaby			C	4	
animals	mammals	Macropodidae	<i>Petrogale sp.</i>				C	1	
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby			C	6	
animals	mammals	Miniopteridae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat			C	3	
animals	mammals	Molossidae	<i>Chaerephon jobensis</i>	northern freetail bat			C	2	

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animals	mammals	Molossidae	<i>Mormopterus lumsdenae</i>	northern free-tailed bat		C		2
animals	mammals	Molossidae	<i>Mormopterus petersi</i>	inland free-tailed bat		C		1
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		6
animals	mammals	Muridae	<i>Leggadina forresti</i>	Forrest's mouse		C		18/2
animals	mammals	Muridae	<i>Melomys cervinipes</i>	fawn-footed melomys		C		2
animals	mammals	Muridae	<i>Melomys sp.</i>			C		3
animals	mammals	Muridae	<i>Mus musculus</i>	house mouse	Y			83/1
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		1
animals	mammals	Muridae	<i>Pseudomys gracilicaudatus</i>	eastern chestnut mouse		C		8
animals	mammals	Muridae	<i>Pseudomys sp.</i>			C		1/1
animals	mammals	Muridae	<i>Rattus sordidus</i>	canefield rat		C		15/7
animals	mammals	Muridae	<i>Rattus sp.</i>			C		1
animals	mammals	Muridae	<i>Rattus tunneyi</i>	pale field-rat		C		1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot		C		7
animals	mammals	Peramelidae	<i>Perameles nasuta</i>	long-nosed bandicoot		C		2
animals	mammals	Petauridae	<i>Petaurus australis australis</i>	yellow-bellied glider (southern subspecies)		V	V	3
animals	mammals	Petauridae	<i>Petaurus norfolcensis</i>	squirrel glider		C		5
animals	mammals	Petauridae	<i>Petaurus notatus</i>	Kreff's glider		C		10
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		12
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		E	E	7
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		4
animals	mammals	Pseudocheiridae	<i>Petauroides armillatus</i>	central greater glider		E	E	23
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		12
animals	mammals	Rhinolophidae	<i>Rhinolophus megaphyllus</i>	eastern horseshoe-bat		C		1
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			12
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		17
animals	mammals	Vespertilionidae	<i>Chalinolobus dwyeri</i>	large-eared pied bat		V	V	1
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		5
animals	mammals	Vespertilionidae	<i>Chalinolobus morio</i>	chocolate wattled bat		C		5
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat		C		11
animals	mammals	Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's long-eared bat		C		5
animals	mammals	Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat		C		4
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		4
animals	mammals	Vespertilionidae	<i>Scotorepens sp.</i>			C		1
animals	mammals	Vespertilionidae	<i>Vespadelus baverstocki</i>	inland forest bat		C		1
animals	mammals	Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat		C		1
animals	mammals	Vespertilionidae	<i>Vespadelus sp.</i>			C		1
animals	mammals	Vespertilionidae	<i>Vespadelus vulturnus</i>	little forest bat		C		5
animals	ray-finned fishes	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				13
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				2
animals	ray-finned fishes	Clupeidae	<i>Nematalosa erebi</i>	bony bream				69
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				5
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris sp.</i>					10
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris species 1</i>	Midgley's carp gudgeon				2

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animals	ray-finned fishes	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon				8
animals	ray-finned fishes	Eleotridae	<i>Oxyeleotris lineolata</i>	sleepy cod				2
animals	ray-finned fishes	Melanotaeniidae	<i>Melanotaenia splendida splendida</i>	eastern rainbowfish				13
animals	ray-finned fishes	Percichthyidae	<i>Macquaria ambigua</i>	golden perch				1
animals	ray-finned fishes	Plotosidae	<i>Neosilurus hyrtlil</i>	Hyrtl's catfish				7
animals	ray-finned fishes	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				5
animals	ray-finned fishes	Poeciliidae	<i>Gambusia holbrooki</i>	mosquitofish	Y			2
animals	ray-finned fishes	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				14
animals	ray-finned fishes	Terapontidae	<i>Scortum hillii</i>	leathery grunter				1
animals	reptiles	Agamidae	<i>Amphibolurus burnsi</i>	Burns's dragon			C	5
animals	reptiles	Agamidae	<i>Amphibolurus sp.</i>				C	1
animals	reptiles	Agamidae	<i>Diporiphora australis</i>	tommy roundhead			C	2
animals	reptiles	Agamidae	<i>Diporiphora lalliae</i>	Lally's two-line dragon			C	1
animals	reptiles	Agamidae	<i>Diporiphora nobbi</i>	nobbi			C	6
animals	reptiles	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon			C	3
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon			C	4
animals	reptiles	Agamidae	<i>Tympanocryptis lineata</i>	lined earless dragon			C	1/1
animals	reptiles	Agamidae	<i>Tympanocryptis sp.</i>				C	31/21
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python			C	4
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python			C	3
animals	reptiles	Boidae	<i>Morelia sp.</i>				C	1
animals	reptiles	Boidae	<i>Morelia spilota</i>	carpet python			C	2
animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko			C	6
animals	reptiles	Carphodactylidae	<i>Saltuarius salebrosus</i>	rough-throated leaf-tailed gecko			C	7
animals	reptiles	Carphodactylidae	<i>Underwoodisaurus millii</i>	thick-tailed gecko			C	1
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle			C	1
animals	reptiles	Chelidae	<i>Emydura macquarii macquarii</i>	Murray turtle			C	1
animals	reptiles	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle			C	1
animals	reptiles	Colubridae	<i>Dendrelaphis punctulatus</i>	green tree snake			C	2
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake			C	2
animals	reptiles	Diplodactylidae	<i>Diplodactylus platyurus</i>	eastern fat-tailed gecko			C	4/1
animals	reptiles	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko			C	5
animals	reptiles	Diplodactylidae	<i>Lucasium steindachneri</i>	Steindachner's gecko			C	2/1
animals	reptiles	Diplodactylidae	<i>Nebulifera robusta</i>	robust velvet gecko			C	5/2
animals	reptiles	Diplodactylidae	<i>Oedura monilis sensu lato</i>	ocellated velvet gecko			C	5/1
animals	reptiles	Diplodactylidae	<i>Oedura tryoni</i>	southern spotted velvet gecko			C	5/1
animals	reptiles	Diplodactylidae	<i>Strophurus williamsi</i>	soft-spined gecko			C	1
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake			C	1/1
animals	reptiles	Elapidae	<i>Cryptophis nigrescens</i>	eastern small-eyed snake			C	1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake			C	1
animals	reptiles	Elapidae	<i>Hemiaspis damelii</i>	grey snake		E	E	1
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake			C	1
animals	reptiles	Elapidae	<i>Pseudonaja nuchalis sensu lato</i>	western brown snake			C	1
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake			C	9/1
animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake			C	1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella			C	28/1

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animals	reptiles	Gekkonidae	<i>Hemidactylus frenatus</i>	house gecko	Y			1
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		30/1
animals	reptiles	Pygopodidae	<i>Delma tincta</i>	excitable delma		C		2
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		1
animals	reptiles	Scincidae	<i>Anomalopus verreauxii</i>	three-clawed worm-skink		C		2
animals	reptiles	Scincidae	<i>Carlia munda</i>	shaded-litter rainbow-skink		C		1/1
animals	reptiles	Scincidae	<i>Carlia pectoralis</i>	open-litter rainbow skink		C		4
animals	reptiles	Scincidae	<i>Carlia pectoralis sensu lato</i>			C		26
animals	reptiles	Scincidae	<i>Carlia rubigo</i>	orange-flanked rainbow skink		C		1
animals	reptiles	Scincidae	<i>Carlia schmeltzii</i>	robust rainbow-skink		C		4/2
animals	reptiles	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink		C		9
animals	reptiles	Scincidae	<i>Concinnia sokosoma</i>	stout bar-sided skink		C		2/1
animals	reptiles	Scincidae	<i>Concinnia tenuis</i>	bar-sided skink		C		1/1
animals	reptiles	Scincidae	<i>Cryptoblepharus australis</i>	inland snake-eyed skink		C		5
animals	reptiles	Scincidae	<i>Cryptoblepharus plagiocephalus sensu lato</i>			C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink		C		17
animals	reptiles	Scincidae	<i>Cryptoblepharus sp.</i>			C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus virgatus sensu lato</i>			C		8
animals	reptiles	Scincidae	<i>Ctenotus sp.</i>			C		1
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus		C		13
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		20/1
animals	reptiles	Scincidae	<i>Eulamprus quoyii</i>	eastern water skink		C		2
animals	reptiles	Scincidae	<i>Eulamprus sp.</i>			C		2/1
animals	reptiles	Scincidae	<i>Glaphyromorphus punctulatus</i>	fine-spotted mulch-skink		C		3
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink		C		2/1
animals	reptiles	Scincidae	<i>Lerista fragilis</i>	eastern mulch slider		C		12
animals	reptiles	Scincidae	<i>Lerista punctatovittata</i>	eastern robust slider		C		2
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>	tree-base litter-skink		C		15/1
animals	reptiles	Scincidae	<i>Menetia greyii</i>	common dwarf skink		C		14
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>	south-eastern morethia skink		C		7
animals	reptiles	Scincidae	<i>Morethia taeniopleura</i>	fire-tailed skink		C		12/3
animals	reptiles	Scincidae	<i>Praeteropus brevicollis</i>	short-necked worm-skink		C		2
animals	reptiles	Scincidae	<i>Tiliqua scincoides scincoides</i>	eastern bluetongue		C		1
animals	reptiles	Typhlopidae	<i>Anilius nigrescens</i>	blackish blind snake		C		1/1
animals	reptiles	Typhlopidae	<i>Anilius proximus</i>	proximus blind snake		C		1/1
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		1
animals	reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		1
animals	uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending				11
fungi	Agaricomycetes	Cortinariaceae	<i>Cortinarius</i>					1/1
fungi	Agaricomycetes	Gomphaceae	<i>Ramaria</i>			C		2/2
fungi	Agaricomycetes	Gomphaceae	<i>Ramaria capitata</i>			C		1/1
fungi	Agaricomycetes	Physalacriaceae	<i>Xerula</i>					1/1
fungi	Agaricomycetes	Polyporaceae	<i>Polyporus</i>					1/1
fungi	Agaricomycetes	Polyporaceae	<i>Pycnoporus coccineus</i>			C		1/1
fungi	Agaricomycetes	Polyporaceae	<i>Trichaptum byssogenum</i>			C		1/1
fungi	Agaricomycetes	Stereaceae	<i>Stereum</i>					1/1

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fungi	Agaricomycetes	Stereaceae	<i>Stereum hirsutum</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Cladonia</i>					2/2
fungi	lecanoromycetes	Cladoniaceae	<i>Cladonia ochrochlora</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Cladonia rigida var. rigida</i>			C		1/1
fungi	lecanoromycetes	Collemaataceae	<i>Collema</i>					1/1
fungi	lecanoromycetes	Lecanoraceae	<i>Lecidella</i>					1/1
fungi	lecanoromycetes	Leprocaulaceae	<i>Leprocaulon microscopicum</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Austroparmelina conlabrosa</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Hypotrachyna immaculata</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Notoparmelia erumpens</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Notoparmelia signifera</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Pannoparmelia wilsonii</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema cooperi</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema eurysacum</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema lobulascens</i>			C		3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema subcaperatum</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema tinctorum</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Punctelia pseudocoralloidea</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Punctelia subflava</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Relicina limbata</i>			C		3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Relicina sydneyensis</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Usnea baileyi</i>			C		6/6
fungi	lecanoromycetes	Parmeliaceae	<i>Usnea rubicunda</i>			C		3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Usnea scabrada subsp. elegans</i>			C		5/5
fungi	lecanoromycetes	Parmeliaceae	<i>Usnea trichodeoides</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia amplexula</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia antleriformis</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia australasica</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia isidiigera</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia neoquintaria</i>			C		3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia tasmanica</i>			C		1/1
fungi	lecanoromycetes	Pertusariaceae	<i>Pertusaria</i>					1/1
fungi	lecanoromycetes	Physciaceae	<i>Heterodermia obscurata</i>			C		1/1
fungi	lecanoromycetes	Physciaceae	<i>Rinodina williamsii</i>			C		1/1
fungi	lecanoromycetes	Psoraceae	<i>Protoblastenia</i>					2/2
fungi	lecanoromycetes	Stereocaulaceae	<i>Lepraria jackii</i>			C		1/1
plants	Ulvophyceae	Trentepohliaceae	<i>Trentepohlia bosseae var. samoensis</i>			C		1/1
plants	green algae	Uronemataceae	<i>Uronema confervicola</i>			C		1/1
plants	land plants	Acanthaceae	<i>Brunoniella australis</i>	blue trumpet		C		5
plants	land plants	Acanthaceae	<i>Dipteracanthus australasicus</i>			C		2
plants	land plants	Acanthaceae	<i>Dipteracanthus australasicus subsp. corynothecus</i>			C		2
plants	land plants	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower		C		7/4
plants	land plants	Acanthaceae	<i>Rostellularia adscendens</i>			C		9/2
plants	land plants	Agavaceae	<i>Agave angustifolia</i>		Y			1/1
plants	land plants	Aizoaceae	<i>Trianthema portulacastrum</i>	black pigweed	Y			5
plants	land plants	Aizoaceae	<i>Trianthema triquetra</i>	red spinach		C		3

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plants	land plants	Aizoaceae	<i>Zaleya galericulata</i>			C		2/2
plants	land plants	Aizoaceae	<i>Zaleya galericulata</i> subsp. <i>galericulata</i>			C		2/2
plants	land plants	Alismataceae	<i>Caldesia oligococca</i>			SL		1/1
plants	land plants	Amaranthaceae	<i>Achyranthes aspera</i>			C		10/4
plants	land plants	Amaranthaceae	<i>Alternanthera denticulata</i>	lesser joyweed		C		8/2
plants	land plants	Amaranthaceae	<i>Alternanthera denticulata</i> var. <i>denticulata</i>			C		1/1
plants	land plants	Amaranthaceae	<i>Alternanthera denticulata</i> var. <i>micrantha</i>			C		2/2
plants	land plants	Amaranthaceae	<i>Alternanthera nana</i>	hairy joyweed		C		7/3
plants	land plants	Amaranthaceae	<i>Alternanthera pungens</i>	khaki weed	Y			1/1
plants	land plants	Amaranthaceae	<i>Amaranthus mitchellii</i>	Boggabri weed		C		1/1
plants	land plants	Amaranthaceae	<i>Amaranthus viridis</i>	green amaranth	Y			1
plants	land plants	Amaranthaceae	<i>Gomphrena celosioides</i>	gomphrena weed	Y			5/3
plants	land plants	Amaranthaceae	<i>Nyssanthes erecta</i>			C		7/6
plants	land plants	Amaranthaceae	<i>Ptilotus macrocephalus</i>	green pussytails		C		1
plants	land plants	Amaranthaceae	<i>Ptilotus polystachyus</i>			C		2/2
plants	land plants	Amaranthaceae	<i>Ptilotus psilorhachis</i>			C		2/2
plants	land plants	Amaranthaceae	<i>Ptilotus semilanatus</i>			C		1/1
plants	land plants	Amaryllidaceae	<i>Crinum</i>					3
plants	land plants	Amaryllidaceae	<i>Crinum flaccidum</i>	Murray lily			SL	3/1
plants	land plants	Annonaceae	<i>Melodorum leichhardtii</i>			C		1/1
plants	land plants	Apiaceae	<i>Centella asiatica</i>			C		1/1
plants	land plants	Apiaceae	<i>CyclospERMUM leptophyllum</i>		Y			2/1
plants	land plants	Apiaceae	<i>Platysace ericoides</i>	heath platysace		C		3/2
plants	land plants	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		11/1
plants	land plants	Apocynaceae	<i>Asclepias curassavica</i>	red-head cottonbush	Y			1/1
plants	land plants	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		17/1
plants	land plants	Apocynaceae	<i>Cerbera dumicola</i>			NT		4/4
plants	land plants	Apocynaceae	<i>Cryptostegia grandiflora</i>	rubber vine	Y			1/1
plants	land plants	Apocynaceae	<i>Cynanchum viminale</i> subsp. <i>brunonianum</i>			C		2/2
plants	land plants	Apocynaceae	<i>Hoya australis</i> subsp. <i>australis</i>			C		5/5
plants	land plants	Apocynaceae	<i>Leichhardtia brevifolia</i>			V	V	3/3
plants	land plants	Apocynaceae	<i>Leichhardtia microlepis</i>			C		4/2
plants	land plants	Apocynaceae	<i>Leichhardtia viridiflora</i>			C		1
plants	land plants	Apocynaceae	<i>Leichhardtia viridiflora</i> subsp. <i>viridiflora</i>			C		3/2
plants	land plants	Apocynaceae	<i>Parsonsia</i>					1
plants	land plants	Apocynaceae	<i>Parsonsia lanceolata</i>	northern silkpod		C		2
plants	land plants	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		1/1
plants	land plants	Apocynaceae	<i>Secamone elliptica</i>			C		1
plants	land plants	Apocynaceae	<i>Vincetoxicum erectum</i>			C		1/1
plants	land plants	Aponogetonaceae	<i>Aponogeton queenslandicus</i>			SL		1/1
plants	land plants	Araliaceae	<i>Astrotricha cordata</i>			C		4
plants	land plants	Araliaceae	<i>Polyscias elegans</i>	celery wood		C		1/1
plants	land plants	Arecaceae	<i>Livistona</i>					2
plants	land plants	Arecaceae	<i>Livistona fulva</i>			V		2/1
plants	land plants	Aristolochiaceae	<i>Aristolochia meridionalis</i> subsp. <i>centralis</i>			C		3/3
plants	land plants	Asphodelaceae	<i>Bulbine fraseri</i>			C		1/1

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plants	land plants	Asteraceae	<i>Acmella grandiflora</i>			C		1
plants	land plants	Asteraceae	<i>Acmella grandiflora</i> var. <i>brachyglossa</i>			C		4/3
plants	land plants	Asteraceae	<i>Apowollastonia spilanthoides</i>			C		2/1
plants	land plants	Asteraceae	<i>Bidens bipinnata</i>	bipinnate beggar's ticks	Y			2/1
plants	land plants	Asteraceae	<i>Bidens pilosa</i>		Y			4
plants	land plants	Asteraceae	<i>Brachyscome</i>					1/1
plants	land plants	Asteraceae	<i>Brachyscome basaltica</i>			C		1/1
plants	land plants	Asteraceae	<i>Brachyscome microcarpa</i> subsp. <i>microcarpa</i>			C		1/1
plants	land plants	Asteraceae	<i>Brachyscome whitei</i> subsp. <i>lophoptera</i>			C		1/1
plants	land plants	Asteraceae	<i>Calotis</i>					2
plants	land plants	Asteraceae	<i>Calotis cuneata</i>			C		8/5
plants	land plants	Asteraceae	<i>Calotis cuneifolia</i>	burr daisy		C		2/2
plants	land plants	Asteraceae	<i>Calotis dentex</i>	white burr daisy		C		5/4
plants	land plants	Asteraceae	<i>Calotis lappulacea</i>	yellow burr daisy		C		1
plants	land plants	Asteraceae	<i>Calyptocarpus vialis</i>	creeping cinderella weed	Y			1
plants	land plants	Asteraceae	<i>Camptacra barbata</i>			C		1/1
plants	land plants	Asteraceae	<i>Camptacra robusta</i>			C		2/2
plants	land plants	Asteraceae	<i>Cassinia</i>					1
plants	land plants	Asteraceae	<i>Centipeda minima</i>			C		1
plants	land plants	Asteraceae	<i>Centipeda minima</i> subsp. <i>minima</i>			C		2/2
plants	land plants	Asteraceae	<i>Chrysocephalum apiculatum</i>	yellow buttons		C		3/2
plants	land plants	Asteraceae	<i>Cirsium vulgare</i>	spear thistle	Y			2
plants	land plants	Asteraceae	<i>Coronidium cymosum</i>			C		3/3
plants	land plants	Asteraceae	<i>Coronidium glutinosum</i>			C		2/1
plants	land plants	Asteraceae	<i>Cyanthillium cinereum</i>			C		11/6
plants	land plants	Asteraceae	<i>Eclipta platyglossa</i> subsp. <i>platyglossa</i>			C		1/1
plants	land plants	Asteraceae	<i>Emilia sonchifolia</i>		Y			1
plants	land plants	Asteraceae	<i>Erigeron bonariensis</i>		Y			2/1
plants	land plants	Asteraceae	<i>Euchiton sphaericus</i>			C		5/4
plants	land plants	Asteraceae	<i>Glossocardia bidens</i>	native cobbler's pegs		C		1/1
plants	land plants	Asteraceae	<i>Gnaphalium</i>					1
plants	land plants	Asteraceae	<i>Gynura drymophila</i>			C		1
plants	land plants	Asteraceae	<i>Gynura drymophila</i> var. <i>drymophila</i>			C		1/1
plants	land plants	Asteraceae	<i>Helianthus annuus</i>		Y			1/1
plants	land plants	Asteraceae	<i>Hemistephtia lyrata</i>			C		3/2
plants	land plants	Asteraceae	<i>Lactuca serriola</i> forma <i>serriola</i>		Y			2/2
plants	land plants	Asteraceae	<i>Lagenophora queenslandica</i>			C		1/1
plants	land plants	Asteraceae	<i>Minuria leptophylla</i>			C		1/1
plants	land plants	Asteraceae	<i>Olearia xerophila</i>			C		1/1
plants	land plants	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			26/8
plants	land plants	Asteraceae	<i>Peripleura bicolor</i>			C		1/1
plants	land plants	Asteraceae	<i>Peripleura diffusa</i>			C		2/2
plants	land plants	Asteraceae	<i>Peripleura hispidula</i> var. <i>hispidula</i>			C		1
plants	land plants	Asteraceae	<i>Peripleura hispidula</i> var. <i>setosa</i>			C		2/2
plants	land plants	Asteraceae	<i>Pluchea xanthina</i>			C		2/2
plants	land plants	Asteraceae	<i>Pterocaulon redolens</i>			C		1

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plants	land plants	Asteraceae	<i>Pterocaulon serrulatum</i> var. <i>serrulatum</i>			C		4/4
plants	land plants	Asteraceae	<i>Rhodanthe polyphylla</i>			C		2/2
plants	land plants	Asteraceae	<i>Rutidosia glandulosa</i>			NT		6/6
plants	land plants	Asteraceae	<i>Senecio prenanthoides</i>			C		1/1
plants	land plants	Asteraceae	<i>Sigesbeckia fugax</i>			C		1/1
plants	land plants	Asteraceae	<i>Sigesbeckia orientalis</i>	Indian weed		C		1/1
plants	land plants	Asteraceae	<i>Sonchus oleraceus</i>	common sowthistle	Y			5/2
plants	land plants	Asteraceae	<i>Sphaeromorphaea australis</i>			C		2/2
plants	land plants	Asteraceae	<i>Sphaeromorphaea subintegra</i>			C		1/1
plants	land plants	Asteraceae	<i>Symphotrichum subulatum</i>		Y			1
plants	land plants	Asteraceae	<i>Tagetes minuta</i>	stinking roger	Y			1/1
plants	land plants	Asteraceae	<i>Tridax procumbens</i>	tridax daisy	Y			2/1
plants	land plants	Asteraceae	<i>Trioncinia retroflexa</i>				E	2/2
plants	land plants	Asteraceae	<i>Verbesina encelioides</i>	crownbeard	Y			2
plants	land plants	Asteraceae	<i>Verbesina encelioides</i> var. <i>encelioides</i>		Y			9/9
plants	land plants	Asteraceae	<i>Vittadinia dissecta</i> var. <i>dissecta</i>				C	2/2
plants	land plants	Asteraceae	<i>Vittadinia pustulata</i>				C	2/1
plants	land plants	Asteraceae	<i>Vittadinia sulcata</i>	native daisy			C	3/1
plants	land plants	Asteraceae	<i>Xanthium occidentale</i>		Y			4/2
plants	land plants	Asteraceae	<i>Xanthium spinosum</i>	Bathurst burr	Y			2/2
plants	land plants	Asteraceae	<i>Zinnia peruviana</i>	wild zinnia	Y			1
plants	land plants	Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine			C	3/1
plants	land plants	Blechnaceae	<i>Blechnum nudum</i>	fishbone water fern			SL	3
plants	land plants	Blechnaceae	<i>Telmatoblechnum indicum</i>				SL	1/1
plants	land plants	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda			C	5
plants	land plants	Boraginaceae	<i>Heliotropium brachygyne</i>				C	2/1
plants	land plants	Boraginaceae	<i>Heliotropium indicum</i>		Y			2/1
plants	land plants	Boraginaceae	<i>Heliotropium moorei</i>				C	2/2
plants	land plants	Boraginaceae	<i>Trichodesma zeylanicum</i>				C	1
plants	land plants	Boraginaceae	<i>Trichodesma zeylanicum</i> var. <i>zeylanicum</i>				C	3/3
plants	land plants	Brassicaceae	<i>Lepidium bonariense</i>	Argentine peppergrass	Y			1/1
plants	land plants	Brassicaceae	<i>Rorippa dietrichiana</i>				C	1/1
plants	land plants	Brassicaceae	<i>Rorippa eustylis</i>				C	1/1
plants	land plants	Brassicaceae	<i>Sisymbrium thellungii</i>	African turnip-weed	Y			2/2
plants	land plants	Burmanniaceae	<i>Burmannia disticha</i>				SL	2/1
plants	land plants	Byttneriaceae	<i>Commersonia dasyphylla</i>				C	1/1
plants	land plants	Byttneriaceae	<i>Commersonia leichhardtii</i>				C	1
plants	land plants	Byttneriaceae	<i>Commersonia pearonii</i>				CR	2/2
plants	land plants	Byttneriaceae	<i>Hannafordia shanesii</i>				C	1/1
plants	land plants	Byttneriaceae	<i>Seringia collina</i>				C	2/1
plants	land plants	Byttneriaceae	<i>Seringia corollata</i>				C	7/2
plants	land plants	Byttneriaceae	<i>Seringia hookeriana</i>				C	4/4
plants	land plants	Byttneriaceae	<i>Seringia lanceolata</i>				C	2/1
plants	land plants	Byttneriaceae	<i>Waltheria indica</i>				C	3/2
plants	land plants	Cactaceae	<i>Harrisia</i>					1
plants	land plants	Cactaceae	<i>Harrisia martinii</i>		Y			8

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plants	land plants	Cactaceae	<i>Harrisia pomanensis</i>		Y			2
plants	land plants	Cactaceae	<i>Opuntia</i>					6
plants	land plants	Cactaceae	<i>Opuntia stricta</i>		Y			4
plants	land plants	Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	Y			13
plants	land plants	Campanulaceae	<i>Isotoma axillaris</i>	australian harebell		SL		4/4
plants	land plants	Campanulaceae	<i>Isotoma gulliveri</i>			SL		1
plants	land plants	Campanulaceae	<i>Lobelia concolor</i>			SL		1/1
plants	land plants	Campanulaceae	<i>Lobelia quadrangularis</i>			SL		1/1
plants	land plants	Campanulaceae	<i>Lobelia trigonocaulis</i>	forest lobelia		SL		1/1
plants	land plants	Campanulaceae	<i>Wahlenbergia</i>					1
plants	land plants	Campanulaceae	<i>Wahlenbergia capillaris</i>			SL		2/1
plants	land plants	Campanulaceae	<i>Wahlenbergia gracilis</i>	sprawling bluebell		SL		2/2
plants	land plants	Campanulaceae	<i>Wahlenbergia islensis</i>			SL		1/1
plants	land plants	Campanulaceae	<i>Wahlenbergia queenslandica</i>			SL		1
plants	land plants	Capparaceae	<i>Capparis anomala</i>			C		6
plants	land plants	Capparaceae	<i>Capparis arborea</i>	brush caper berry		C		1
plants	land plants	Capparaceae	<i>Capparis canescens</i>			C		3/2
plants	land plants	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		13/4
plants	land plants	Capparaceae	<i>Capparis loranthifolia</i>			C		7
plants	land plants	Capparaceae	<i>Capparis loranthifolia</i> var. <i>bancroftii</i>			C		1/1
plants	land plants	Capparaceae	<i>Capparis loranthifolia</i> var. <i>loranthifolia</i>			C		1/1
plants	land plants	Capparaceae	<i>Capparis mitchellii</i>			C		5
plants	land plants	Capparaceae	<i>Capparis shanesiana</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea breviflora</i>			C		2/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea corymbosa</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>			C		1/1
plants	land plants	Caryophyllaceae	<i>Polycarpaea spirostylis</i> subsp. <i>compacta</i>			C		1
plants	land plants	Casuarinaceae	<i>Allocasuarina littoralis</i>			C		4
plants	land plants	Casuarinaceae	<i>Allocasuarina luehmannii</i>	bull oak		C		12/1
plants	land plants	Casuarinaceae	<i>Allocasuarina torulosa</i>			C		100/1
plants	land plants	Casuarinaceae	<i>Casuarina cristata</i>	belah		C		3
plants	land plants	Casuarinaceae	<i>Casuarina cunninghamiana</i>			C		4
plants	land plants	Celastraceae	<i>Denhamia cunninghamii</i>			C		2/1
plants	land plants	Celastraceae	<i>Denhamia disperma</i>			C		1
plants	land plants	Celastraceae	<i>Denhamia oleaster</i>			C		10
plants	land plants	Celastraceae	<i>Elaeodendron australe</i>			C		4
plants	land plants	Celastraceae	<i>Elaeodendron australe</i> var. <i>australe</i>			C		1/1
plants	land plants	Celastraceae	<i>Elaeodendron australe</i> var. <i>integrifolium</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Atriplex muelleri</i>	lagoon saltbush		C		3
plants	land plants	Chenopodiaceae	<i>Atriplex semibaccata</i>	creeping saltbush		C		2
plants	land plants	Chenopodiaceae	<i>Chenopodium auricomiforme</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Dysphania carinata</i>			C		4/3
plants	land plants	Chenopodiaceae	<i>Dysphania glomulifera</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Dysphania glomulifera</i> subsp. <i>glomulifera</i>			C		3/3
plants	land plants	Chenopodiaceae	<i>Dysphania pumilio</i>			C		1
plants	land plants	Chenopodiaceae	<i>Einadia hastata</i>			C		2/1

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plants	land plants	Chenopodiaceae	<i>Einadia nutans</i>			C		5
plants	land plants	Chenopodiaceae	<i>Einadia nutans subsp. linifolia</i>			C		2/2
plants	land plants	Chenopodiaceae	<i>Einadia nutans subsp. nutans</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Einadia polygonoides</i>	knotweed goosefoot		C		3
plants	land plants	Chenopodiaceae	<i>Einadia trigonos subsp. stellulata</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Enchylaena tomentosa</i>			C		10
plants	land plants	Chenopodiaceae	<i>Enchylaena tomentosa var. tomentosa</i>			C		2/2
plants	land plants	Chenopodiaceae	<i>Maireana microphylla</i>			C		5/2
plants	land plants	Chenopodiaceae	<i>Rhagodia parabolica</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Rhagodia spinescens</i>	thorny saltbush		C		1
plants	land plants	Chenopodiaceae	<i>Salsola australis</i>			C		8
plants	land plants	Chenopodiaceae	<i>Sclerolaena anisacanthoides</i>	yellow burr		C		1/1
plants	land plants	Chenopodiaceae	<i>Sclerolaena bicornis var. horrida</i>			C		2
plants	land plants	Chenopodiaceae	<i>Sclerolaena calcarata</i>	red burr		C		1/1
plants	land plants	Chenopodiaceae	<i>Sclerolaena convexula</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Sclerolaena muricata</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Sclerolaena muricata var. muricata</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Sclerolaena muricata var. villosa</i>			C		2/2
plants	land plants	Chenopodiaceae	<i>Sclerolaena ramulosa</i>			C		1/1
plants	land plants	Cleomaceae	<i>Arivela tetrandra</i>			C		1
plants	land plants	Cleomaceae	<i>Arivela viscosa</i>			C		1
plants	land plants	Colchicaceae	<i>Iphigenia indica</i>			C		1/1
plants	land plants	Combretaceae	<i>Macropteranthes leichhardtii</i>	bonewood		C		3/2
plants	land plants	Combretaceae	<i>Terminalia oblongata</i>			C		17
plants	land plants	Combretaceae	<i>Terminalia oblongata subsp. oblongata</i>			C		11/8
plants	land plants	Commelinaceae	<i>Commelina diffusa</i>			C		6
plants	land plants	Commelinaceae	<i>Commelina ensifolia</i>	scurvy grass		C		2/1
plants	land plants	Commelinaceae	<i>Commelina lanceolata</i>			C		2/2
plants	land plants	Commelinaceae	<i>Murdannia graminea</i>	murdannia		C		1/1
plants	land plants	Convolvulaceae	<i>Bonamia media</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Convolvulus erubescens</i>	Australian bindweed		C		2
plants	land plants	Convolvulaceae	<i>Convolvulus graminetinus</i>			C		4/4
plants	land plants	Convolvulaceae	<i>Evolvulus alsinoides</i>			C		4
plants	land plants	Convolvulaceae	<i>Evolvulus alsinoides var. decumbens</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Evolvulus alsinoides var. villosicalyx</i>			C		3/2
plants	land plants	Convolvulaceae	<i>Ipomoea calobra</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Ipomoea lonchophylla</i>			C		4/3
plants	land plants	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine		C		6/2
plants	land plants	Convolvulaceae	<i>Polymeria</i>					1/1
plants	land plants	Convolvulaceae	<i>Polymeria calycina</i>	pink bindweed		C		1/1
plants	land plants	Convolvulaceae	<i>Polymeria marginata</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Polymeria pusilla</i>			C		3
plants	land plants	Crassulaceae	<i>Bryophyllum delagoense</i>		Y			8/2
plants	land plants	Crassulaceae	<i>Crassula tetramera</i>			C		1/1
plants	land plants	Cucurbitaceae	<i>Cucumis melo</i>			C		2/1
plants	land plants	Cupressaceae	<i>Callitris endlicheri</i>	black cypress pine		C		3/2

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plants	land plants	Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine		C		5/1
plants	land plants	Cyatheaceae	<i>Sphaeropteris cooperi</i>			C		2
plants	land plants	Cyperaceae	<i>Bulbostylis barbata</i>			C		2/2
plants	land plants	Cyperaceae	<i>Bulbostylis sp. (Goonderoo R.J.Fensham 3815)</i>			C		2/2
plants	land plants	Cyperaceae	<i>Caustis</i>					2
plants	land plants	Cyperaceae	<i>Caustis flexuosa</i>			C		1
plants	land plants	Cyperaceae	<i>Caustis pentandra</i>	thick twistrush		C		2/1
plants	land plants	Cyperaceae	<i>Caustis sp. (Robinson Gorge P.I.Forster+ PIF11256)</i>			C		5/2
plants	land plants	Cyperaceae	<i>Cyperus</i>					6
plants	land plants	Cyperaceae	<i>Cyperus betchei</i>			C		6
plants	land plants	Cyperaceae	<i>Cyperus betchei subsp. betchei</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus bifax</i>	western nutgrass		C		4/4
plants	land plants	Cyperaceae	<i>Cyperus castaneus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus clarus</i>			V		5/5
plants	land plants	Cyperaceae	<i>Cyperus concinnus</i>			C		3/2
plants	land plants	Cyperaceae	<i>Cyperus curvistylis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus dactylotes</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus dietrichiae var. brevibracteatus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus dietrichiae var. dietrichiae</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus difformis</i>	rice sedge		C		4/2
plants	land plants	Cyperaceae	<i>Cyperus exaltatus</i>	tall flatsedge		C		1/1
plants	land plants	Cyperaceae	<i>Cyperus fulvus</i>			C		6/4
plants	land plants	Cyperaceae	<i>Cyperus gilesii</i>			C		1
plants	land plants	Cyperaceae	<i>Cyperus gracilis</i>			C		8/3
plants	land plants	Cyperaceae	<i>Cyperus gunnii subsp. novae-hollandiae</i>			C		1
plants	land plants	Cyperaceae	<i>Cyperus haspan</i>			C		2/1
plants	land plants	Cyperaceae	<i>Cyperus haspan subsp. haspan</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus iria</i>			C		4
plants	land plants	Cyperaceae	<i>Cyperus isabellinus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus javanicus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus leptocarpus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus lucidus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus nutans var. eleusinoides</i>	flatsedge		C		1/1
plants	land plants	Cyperaceae	<i>Cyperus polystachyos</i>			C		1
plants	land plants	Cyperaceae	<i>Cyperus rotundus</i>	nutgrass	Y			1/1
plants	land plants	Cyperaceae	<i>Cyperus squarrosus</i>	bearded flatsedge		C		1/1
plants	land plants	Cyperaceae	<i>Cyperus victoriensis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis</i>					1
plants	land plants	Cyperaceae	<i>Eleocharis atricha</i>	tuber spikerush		C		4/2
plants	land plants	Cyperaceae	<i>Eleocharis dulcis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis pallens</i>	pale spikerush		C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis plana</i>	ribbed spikerush		C		3/2
plants	land plants	Cyperaceae	<i>Eleocharis sphacelata</i>	tall spikerush		C		3/2
plants	land plants	Cyperaceae	<i>Eleocharis tetraquetra</i>			C		1/1
plants	land plants	Cyperaceae	<i>Fimbristylis dichotoma</i>	common fringe-rush		C		8/6
plants	land plants	Cyperaceae	<i>Fimbristylis microcarya</i>			C		1/1

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plants	land plants	Cyperaceae	<i>Fimbristylis sieberiana</i>			C		1/1
plants	land plants	Cyperaceae	<i>Fuirena ciliaris</i>			C		1
plants	land plants	Cyperaceae	<i>Fuirena incrassata</i>			C		1/1
plants	land plants	Cyperaceae	<i>Isolepis subtilissima</i>			C		1/1
plants	land plants	Cyperaceae	<i>Lepidosperma laterale</i>			C		3
plants	land plants	Cyperaceae	<i>Machaerina planifolia</i>			C		2/1
plants	land plants	Cyperaceae	<i>Machaerina rubiginosa</i>			C		2
plants	land plants	Cyperaceae	<i>Schoenoplectiella erecta</i>		Y			2/1
plants	land plants	Cyperaceae	<i>Schoenoplectiella mucronata</i>			C		1
plants	land plants	Cyperaceae	<i>Schoenus</i>					3/3
plants	land plants	Cyperaceae	<i>Schoenus kennyi</i>			C		4/3
plants	land plants	Cyperaceae	<i>Schoenus melanostachys</i>			C		2/1
plants	land plants	Cyperaceae	<i>Schoenus sparteus</i>			C		1/1
plants	land plants	Cyperaceae	<i>Scleria brownii</i>			C		1/1
plants	land plants	Cyperaceae	<i>Scleria mackaviensis</i>			C		3/1
plants	land plants	Cyperaceae	<i>Scleria sphacelata</i>			C		4/2
plants	land plants	Davalliaceae	<i>Davallia pyxidata</i>			C		1
plants	land plants	Dennstaedtiaceae	<i>Histiopteris incisa</i>	bats-wing fern		C		2
plants	land plants	Dennstaedtiaceae	<i>Pteridium esculentum</i>	common bracken		C		5
plants	land plants	Dicksoniaceae	<i>Calochlaena dubia</i>			C		4
plants	land plants	Dilleniaceae	<i>Hibbertia</i>					2/2
plants	land plants	Dilleniaceae	<i>Hibbertia acicularis</i>			C		1/1
plants	land plants	Dilleniaceae	<i>Hibbertia aspera</i>			C		3
plants	land plants	Dilleniaceae	<i>Hibbertia cistoidea</i>			C		1/1
plants	land plants	Dilleniaceae	<i>Hibbertia ferox</i>			C		1/1
plants	land plants	Dilleniaceae	<i>Hibbertia hendersonii</i>			C		3/3
plants	land plants	Dilleniaceae	<i>Hibbertia linearis</i>			C		1
plants	land plants	Dilleniaceae	<i>Hibbertia linearis</i> var. <i>obtusifolia</i>			C		5
plants	land plants	Dilleniaceae	<i>Hibbertia oligodonta</i>			C		10/5
plants	land plants	Dilleniaceae	<i>Hibbertia riparia</i>			C		4
plants	land plants	Dilleniaceae	<i>Hibbertia stricta</i>			C		3/1
plants	land plants	Droseraceae	<i>Drosera binata</i>	forked sundew		SL		2/1
plants	land plants	Droseraceae	<i>Drosera spatulata</i>			SL		1
plants	land plants	Droseraceae	<i>Drosera spatulata</i> var. <i>spatulata</i>			SL		1/1
plants	land plants	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		10/2
plants	land plants	Ericaceae	<i>Acrotriche aggregata</i>	red cluster heath		C		3/2
plants	land plants	Ericaceae	<i>Brachyloma daphnoides</i>			C		3
plants	land plants	Ericaceae	<i>Brachyloma daphnoides</i> subsp. <i>daphnoides</i>			C		1/1
plants	land plants	Ericaceae	<i>Leucopogon</i>					1
plants	land plants	Ericaceae	<i>Melichrus</i>					2/1
plants	land plants	Ericaceae	<i>Melichrus</i> sp. (Isla Gorge P.Sharpe+ 601)			C		4/1
plants	land plants	Ericaceae	<i>Monotoca scoparia</i>	prickly broom heath		C		2/1
plants	land plants	Ericaceae	<i>Styphelia biflora</i>			C		2/1
plants	land plants	Ericaceae	<i>Styphelia cuspidata</i>			C		1/1
plants	land plants	Ericaceae	<i>Styphelia grandiflora</i>			C		1/1
plants	land plants	Ericaceae	<i>Styphelia mitchellii</i>			C		2/1

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plants	land plants	Ericaceae	<i>Styphelia mutica</i>			C		3/3
plants	land plants	Eriocaulaceae	<i>Eriocaulon scariosum</i>			C		4/2
plants	land plants	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		7/4
plants	land plants	Euphorbiaceae	<i>Acalypha</i>					1
plants	land plants	Euphorbiaceae	<i>Acalypha capillipes</i>	small-leaved acalypha		C		6
plants	land plants	Euphorbiaceae	<i>Acalypha eremorum</i>	soft acalypha		C		8/4
plants	land plants	Euphorbiaceae	<i>Adriana tomentosa</i> var. <i>tomentosa</i>			C		3/3
plants	land plants	Euphorbiaceae	<i>Bertya lapicola</i> subsp. <i>brevifolia</i>			C		6/6
plants	land plants	Euphorbiaceae	<i>Bertya opponens</i>			C	V	4/4
plants	land plants	Euphorbiaceae	<i>Bertya pedicellata</i>			NT		2
plants	land plants	Euphorbiaceae	<i>Croton insularis</i>	Queensland cascarilla		C		4/3
plants	land plants	Euphorbiaceae	<i>Croton pheballoides</i>	narrow-leaved croton		C		6/3
plants	land plants	Euphorbiaceae	<i>Euphorbia</i>					3
plants	land plants	Euphorbiaceae	<i>Euphorbia coghlanii</i>			C		5/5
plants	land plants	Euphorbiaceae	<i>Euphorbia dallachyana</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia drummondii</i>			C		6/3
plants	land plants	Euphorbiaceae	<i>Euphorbia hirta</i>		Y			2/2
plants	land plants	Euphorbiaceae	<i>Euphorbia hyssopifolia</i>		Y			3/3
plants	land plants	Euphorbiaceae	<i>Euphorbia laciniolata</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia papillifolia</i> var. <i>papillifolia</i>			C		3/3
plants	land plants	Euphorbiaceae	<i>Euphorbia stevenii</i>	bottle tree spurge		C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>			C		7/5
plants	land plants	Euphorbiaceae	<i>Mallotus philippensis</i>	red kamala		C		1
plants	land plants	Euphorbiaceae	<i>Ricinocarpos</i>					1
plants	land plants	Euphorbiaceae	<i>Ricinocarpos linearifolius</i>			C		14/11
plants	land plants	Euphorbiaceae	<i>Ricinocarpos ruminatus</i>			C		6/3
plants	land plants	Fabaceae	<i>Fabaceae</i>					1
plants	land plants	Fissidentaceae	<i>Fissidens</i>					1/1
plants	land plants	Fissidentaceae	<i>Fissidens asplenioides</i>			C		1/1
plants	land plants	Gentianaceae	<i>Schenkia australis</i>			C		1/1
plants	land plants	Gleicheniaceae	<i>Dicranopteris linearis</i>			C		1
plants	land plants	Gleicheniaceae	<i>Gleichenia dicarpa</i>	pouched coral fern		C		3/1
plants	land plants	Gleicheniaceae	<i>Sticherus flabellatus</i> var. <i>flabellatus</i>			C		5/2
plants	land plants	Goodeniaceae	<i>Brunonia australis</i>	blue pincushion		SL		1
plants	land plants	Goodeniaceae	<i>Dampiera adpressa</i>			C		2/2
plants	land plants	Goodeniaceae	<i>Dampiera discolor</i>			C		1
plants	land plants	Goodeniaceae	<i>Goodenia</i>					1
plants	land plants	Goodeniaceae	<i>Goodenia bellidifolia</i> subsp. <i>argentea</i>			C		1/1
plants	land plants	Goodeniaceae	<i>Goodenia glabra</i>			C		7/7
plants	land plants	Goodeniaceae	<i>Goodenia grandiflora</i>			C		7/6
plants	land plants	Goodeniaceae	<i>Goodenia racemosa</i>			C		1
plants	land plants	Goodeniaceae	<i>Goodenia racemosa</i> var. <i>racemosa</i>			C		1
plants	land plants	Goodeniaceae	<i>Goodenia rosulata</i>			C		1/1
plants	land plants	Goodeniaceae	<i>Goodenia rotundifolia</i>			C		5/4
plants	land plants	Goodeniaceae	<i>Goodenia</i> sp. (Mt Castletower M.D.Crisp 2753)			C		1/1
plants	land plants	Goodeniaceae	<i>Scaevola humilis</i>			C		3/3

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plants	land plants	Gyrostemonaceae	<i>Codonocarpus attenuatus</i>			C		3/2
plants	land plants	Gyrostemonaceae	<i>Codonocarpus cotinifolius</i>			C		1
plants	land plants	Haemodoraceae	<i>Haemodorum austroqueenslandicum</i>			C		2/1
plants	land plants	Haloragaceae	<i>Gonocarpus</i>					1/1
plants	land plants	Haloragaceae	<i>Gonocarpus chinensis subsp. verrucosus</i>			C		1/1
plants	land plants	Haloragaceae	<i>Gonocarpus elatus</i>			C		1
plants	land plants	Haloragaceae	<i>Gonocarpus humilis</i>			C		1/1
plants	land plants	Haloragaceae	<i>Haloragis glauca</i>			C		1
plants	land plants	Haloragaceae	<i>Haloragis glauca forma glauca</i>			C		2/2
plants	land plants	Haloragaceae	<i>Haloragis heterophylla</i>	rough raspweed		C		1/1
plants	land plants	Haloragaceae	<i>Haloragis stricta</i>			C		10/8
plants	land plants	Haloragaceae	<i>Myriophyllum simulans</i>			C		2/1
plants	land plants	Haloragaceae	<i>Myriophyllum variifolium</i>			C		1/1
plants	land plants	Hemerocallidaceae	<i>Dianella</i>					2
plants	land plants	Hemerocallidaceae	<i>Dianella caerulea</i>			C		4/2
plants	land plants	Hemerocallidaceae	<i>Dianella longifolia</i>			C		3/2
plants	land plants	Hemerocallidaceae	<i>Dianella longifolia var. stenophylla</i>			C		1/1
plants	land plants	Hemerocallidaceae	<i>Dianella rara</i>			C		1/1
plants	land plants	Hemerocallidaceae	<i>Dianella revoluta</i>			C		5/1
plants	land plants	Hydrocharitaceae	<i>Ottelia ovalifolia subsp. ovalifolia</i>			SL		1/1
plants	land plants	Hydrocharitaceae	<i>Vallisneria nana</i>			SL		1/1
plants	land plants	Hypericaceae	<i>Hypericum gramineum</i>			C		2
plants	land plants	Hypoxidaceae	<i>Hypoxis arillacea</i>			C		5/5
plants	land plants	Iridaceae	<i>Patersonia sericea var. sericea</i>			C		1
plants	land plants	Johnsoniaceae	<i>Caesia parviflora</i>			C		1/1
plants	land plants	Johnsoniaceae	<i>Caesia parviflora var. parviflora</i>			C		2
plants	land plants	Johnsoniaceae	<i>Tricoryne elatior</i>	yellow autumn lily		C		2/1
plants	land plants	Johnsoniaceae	<i>Tricoryne muricata</i>			C		3/1
plants	land plants	Juncaceae	<i>Juncus</i>					1
plants	land plants	Juncaceae	<i>Juncus aridicola</i>	tussock rush		C		2
plants	land plants	Juncaceae	<i>Juncus continuus</i>			C		2/1
plants	land plants	Juncaceae	<i>Juncus prismatocarpus</i>	branching rush		C		3/2
plants	land plants	Juncaceae	<i>Juncus usitatus</i>			C		1
plants	land plants	Juncaginaceae	<i>Cycnogeton procerus</i>			SL		1/1
plants	land plants	Lamiaceae	<i>Ajuga australis</i>	Australian bugle		C		5/4
plants	land plants	Lamiaceae	<i>Basilicum polystachyon</i>			C		4/4
plants	land plants	Lamiaceae	<i>Chloanthes parviflora</i>			C		4/3
plants	land plants	Lamiaceae	<i>Clerodendrum floribundum</i>			C		5
plants	land plants	Lamiaceae	<i>Coleus australis</i>			C		2/2
plants	land plants	Lamiaceae	<i>Coleus blakei</i>			NT		7/7
plants	land plants	Lamiaceae	<i>Coleus graveolens</i>			C		1/1
plants	land plants	Lamiaceae	<i>Ocimum tenuiflorum</i>			C		4
plants	land plants	Lamiaceae	<i>Plectranthus</i>					1
plants	land plants	Lamiaceae	<i>Prostanthera</i>					1/1
plants	land plants	Lamiaceae	<i>Prostanthera collina</i>			C		2/2
plants	land plants	Lamiaceae	<i>Prostanthera cryptandroides subsp. euphrasioides</i>			C		9/7

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Lamiaceae	<i>Prostanthera oleoides</i>			C		3/3
plants	land plants	Lamiaceae	<i>Prostanthera parvifolia</i>			C		2/2
plants	land plants	Lamiaceae	<i>Prostanthera suborbicularis</i>			C		2/2
plants	land plants	Lamiaceae	<i>Salvia reflexa</i>		Y			1/1
plants	land plants	Lamiaceae	<i>Teucrium daucooides</i>			C		1
plants	land plants	Lamiaceae	<i>Teucrium integrifolium</i>			C		1/1
plants	land plants	Lamiaceae	<i>Teucrium junceum</i>			C		2
plants	land plants	Lamiaceae	<i>Teucrium puberulum</i>			C		1/1
plants	land plants	Lauraceae	<i>Cassytha pubescens</i>	downy devil's twine		C		2
plants	land plants	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry		C		6
plants	land plants	Laxmanniaceae	<i>Laxmannia compacta</i>			C		2/2
plants	land plants	Laxmanniaceae	<i>Laxmannia gracilis</i>	slender wire lily		C		6/3
plants	land plants	Laxmanniaceae	<i>Lomandra</i>					4
plants	land plants	Laxmanniaceae	<i>Lomandra confertifolia</i> subsp. <i>pallida</i>			C		6/1
plants	land plants	Laxmanniaceae	<i>Lomandra filiformis</i>			C		3
plants	land plants	Laxmanniaceae	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>			C		4/2
plants	land plants	Laxmanniaceae	<i>Lomandra glauca</i>	pale matrush		C		1/1
plants	land plants	Laxmanniaceae	<i>Lomandra leucocephala</i>			C		2
plants	land plants	Laxmanniaceae	<i>Lomandra longifolia</i>			C		8
plants	land plants	Laxmanniaceae	<i>Lomandra multiflora</i>			C		2/1
plants	land plants	Laxmanniaceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>			C		6/2
plants	land plants	Laxmanniaceae	<i>Lomandra obliqua</i>			C		2/1
plants	land plants	Leguminosae	<i>Acacia</i>					1
plants	land plants	Leguminosae	<i>Acacia amblygona</i>	fan-leaf wattle		C		2/2
plants	land plants	Leguminosae	<i>Acacia angusta</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia bancroftiorum</i>			C		3/2
plants	land plants	Leguminosae	<i>Acacia blakei</i> subsp. <i>blakei</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia burbidgeae</i>			C		2/2
plants	land plants	Leguminosae	<i>Acacia burrowii</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia caroleae</i>			C		1
plants	land plants	Leguminosae	<i>Acacia catenulata</i>	bendee		C		3/1
plants	land plants	Leguminosae	<i>Acacia complanata</i>	flatstem wattle		C		5
plants	land plants	Leguminosae	<i>Acacia conferta</i>			C		2
plants	land plants	Leguminosae	<i>Acacia crassa</i>			C		2
plants	land plants	Leguminosae	<i>Acacia crassa</i> subsp. <i>crassa</i>			C		3
plants	land plants	Leguminosae	<i>Acacia cretata</i>			C		6/4
plants	land plants	Leguminosae	<i>Acacia cretata</i> x <i>Acacia fodinalis</i>			C		3/3
plants	land plants	Leguminosae	<i>Acacia cretata</i> x <i>Acacia leiocalyx</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia deanei</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia decora</i>	pretty wattle		C		2/1
plants	land plants	Leguminosae	<i>Acacia dietrichiana</i>			C		2/1
plants	land plants	Leguminosae	<i>Acacia everistii</i>			C		2/2
plants	land plants	Leguminosae	<i>Acacia excelsa</i>			C		6
plants	land plants	Leguminosae	<i>Acacia falciformis</i>	broad-leaved hickory		C		1/1
plants	land plants	Leguminosae	<i>Acacia flavescens</i>	toothed wattle		C		8
plants	land plants	Leguminosae	<i>Acacia gittinsii</i>			C		12/7

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plants	land plants	Leguminosae	<i>Acacia glaucocarpa</i>	hickory wattle		C		1
plants	land plants	Leguminosae	<i>Acacia harpophylla</i>	brigalow		C		18
plants	land plants	Leguminosae	<i>Acacia johnsonii</i>			C		2/2
plants	land plants	Leguminosae	<i>Acacia julifera subsp. julifera</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia juncifolia</i>			C		6/4
plants	land plants	Leguminosae	<i>Acacia leichhardtii</i>			C		5/2
plants	land plants	Leguminosae	<i>Acacia leiocalyx subsp. leiocalyx</i>			C		2/1
plants	land plants	Leguminosae	<i>Acacia leptocarpa</i>	north coast wattle		C		1
plants	land plants	Leguminosae	<i>Acacia leptostachya</i>	Townsville wattle		C		8/4
plants	land plants	Leguminosae	<i>Acacia longispicata</i>			C		3/3
plants	land plants	Leguminosae	<i>Acacia macradenia</i>	zig-zag wattle		C		3
plants	land plants	Leguminosae	<i>Acacia melvillei</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia neobrachycarpa</i>			C		5/2
plants	land plants	Leguminosae	<i>Acacia neriifolia</i>	pechey wattle		C		5/4
plants	land plants	Leguminosae	<i>Acacia pendula</i>	myall		C		1
plants	land plants	Leguminosae	<i>Acacia podalyriifolia</i>	Queensland silver wattle		C		1/1
plants	land plants	Leguminosae	<i>Acacia polifolia</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia salicina</i>	doolan		C		17/2
plants	land plants	Leguminosae	<i>Acacia shirleyi</i>	lancewood		C		4/2
plants	land plants	Leguminosae	<i>Acacia sp. (Comet L.Pedley 4091)</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia storyi</i>			NT		6/4
plants	land plants	Leguminosae	<i>Acacia triptera</i>			C		1/1
plants	land plants	Leguminosae	<i>Acacia venulosa</i>	veined wattle		C		5/5
plants	land plants	Leguminosae	<i>Aeschynomene brevifolia</i>			C		1/1
plants	land plants	Leguminosae	<i>Aeschynomene indica</i>	budda pea		C		2/1
plants	land plants	Leguminosae	<i>Alysicarpus muelleri</i>			C		1/1
plants	land plants	Leguminosae	<i>Aotus subglauca var. filiformis</i>			C		1
plants	land plants	Leguminosae	<i>Bossiaea brownii</i>			C		3/1
plants	land plants	Leguminosae	<i>Bossiaea carinalis</i>			C		7/3
plants	land plants	Leguminosae	<i>Bossiaea concolor</i>			C		2
plants	land plants	Leguminosae	<i>Cajanus acutifolius</i>			C		2/2
plants	land plants	Leguminosae	<i>Cassia brewsteri</i>			C		13/5
plants	land plants	Leguminosae	<i>Cassia brewsteri var. sylvestris</i>			C		1
plants	land plants	Leguminosae	<i>Chamaecrista rotundifolia var. rotundifolia</i>		Y			1/1
plants	land plants	Leguminosae	<i>Clitoria ternatea</i>	butterfly pea	Y			3/2
plants	land plants	Leguminosae	<i>Crotalaria dissitiflora</i>			C		1
plants	land plants	Leguminosae	<i>Crotalaria dissitiflora subsp. dissitiflora</i>			C		3/2
plants	land plants	Leguminosae	<i>Crotalaria incana</i>		Y			2/1
plants	land plants	Leguminosae	<i>Crotalaria incana subsp. incana</i>		Y			4/3
plants	land plants	Leguminosae	<i>Crotalaria juncea</i>	sunhemp	Y			3/2
plants	land plants	Leguminosae	<i>Crotalaria verrucosa</i>			C		1/1
plants	land plants	Leguminosae	<i>Cullen tenax</i>	emu-foot		C		3/3
plants	land plants	Leguminosae	<i>Daviesia acicularis</i>			C		1/1
plants	land plants	Leguminosae	<i>Daviesia discolor</i>			V	V	4/3
plants	land plants	Leguminosae	<i>Daviesia filipes subsp. filipes</i>			C		2/2
plants	land plants	Leguminosae	<i>Daviesia quoquoversus</i>			V		2

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plants	land plants	Leguminosae	<i>Daviesia ulicifolia</i>	native gorse		C		2
plants	land plants	Leguminosae	<i>Daviesia ulicifolia</i> subsp. <i>ulicifolia</i>			C		2
plants	land plants	Leguminosae	<i>Daviesia villifera</i>	prickly daviesia		C		3/1
plants	land plants	Leguminosae	<i>Daviesia wyattiana</i>	long-leaved bitter pea		C		4/2
plants	land plants	Leguminosae	<i>Desmodium brachypodium</i>	large ticktrefoil		C		3/1
plants	land plants	Leguminosae	<i>Desmodium campylocaulon</i>			C		3/3
plants	land plants	Leguminosae	<i>Desmodium macrocarpum</i>			C		2/2
plants	land plants	Leguminosae	<i>Desmodium rhytidophyllum</i>			C		1/1
plants	land plants	Leguminosae	<i>Desmodium varians</i>	slender tick trefoil		C		2/1
plants	land plants	Leguminosae	<i>Dillwynia phyllicoides</i>			C		2/2
plants	land plants	Leguminosae	<i>Erythrina vespertilio</i>			C		1
plants	land plants	Leguminosae	<i>Galactia tenuiflora</i>			C		1
plants	land plants	Leguminosae	<i>Galactia tenuiflora</i> var. <i>lucida</i>			C		5/5
plants	land plants	Leguminosae	<i>Glycine clandestina</i>			C		1
plants	land plants	Leguminosae	<i>Glycine falcata</i>			C		3/3
plants	land plants	Leguminosae	<i>Glycine latifolia</i>			C		3/3
plants	land plants	Leguminosae	<i>Glycine stenophita</i>			C		1/1
plants	land plants	Leguminosae	<i>Glycine tabacina</i>	glycine pea		C		1
plants	land plants	Leguminosae	<i>Glycine tomentella</i>	woolly glycine		C		7/2
plants	land plants	Leguminosae	<i>Gompholobium foliolosum</i>	fern-leaved burtonia		C		3
plants	land plants	Leguminosae	<i>Hardenbergia perbrevidens</i>			C		2/2
plants	land plants	Leguminosae	<i>Hardenbergia violacea</i>			C		1
plants	land plants	Leguminosae	<i>Heliodendron basalticum</i>			C		1/1
plants	land plants	Leguminosae	<i>Hovea</i>					4
plants	land plants	Leguminosae	<i>Hovea linearis</i>	erect hovea		C		2/2
plants	land plants	Leguminosae	<i>Hovea linearis</i> x <i>Hovea planifolia</i>			C		2/2
plants	land plants	Leguminosae	<i>Hovea lorata</i>			C		2/2
plants	land plants	Leguminosae	<i>Hovea parvicalyx</i>			C		3/3
plants	land plants	Leguminosae	<i>Hovea planifolia</i>			C		9/4
plants	land plants	Leguminosae	<i>Hovea planifolia</i> x <i>Hovea tholiformis</i>			C		1/1
plants	land plants	Leguminosae	<i>Hovea tholiformis</i>			C		6/1
plants	land plants	Leguminosae	<i>Indigofera</i>					2
plants	land plants	Leguminosae	<i>Indigofera australis</i>			C		2
plants	land plants	Leguminosae	<i>Indigofera brevidens</i>			C		4/3
plants	land plants	Leguminosae	<i>Indigofera colutea</i>	sticky indigo		C		2/1
plants	land plants	Leguminosae	<i>Indigofera ewartiana</i>			C		1/1
plants	land plants	Leguminosae	<i>Indigofera linifolia</i>			C		3/2
plants	land plants	Leguminosae	<i>Indigofera linnaei</i>	Birdsville indigo		C		2/1
plants	land plants	Leguminosae	<i>Indigofera pratensis</i>			C		1/1
plants	land plants	Leguminosae	<i>Jacksonia rhadinoclona</i>	Miles dogwood		C		1/1
plants	land plants	Leguminosae	<i>Jacksonia scoparia</i>			C		8/1
plants	land plants	Leguminosae	<i>Kennedia</i> sp. (<i>Blackdown Tableland R.J.Henderson+H747</i>)			C		1/1
plants	land plants	Leguminosae	<i>Lablab purpureus</i>	lablab		Y		1/1
plants	land plants	Leguminosae	<i>Leucaena leucocephala</i> subsp. <i>leucocephala</i>			Y		1/1
plants	land plants	Leguminosae	<i>Lysiphyllum</i>					1

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plants	land plants	Leguminosae	<i>Lysiphyllum carronii</i>	ebony tree		C		12/1
plants	land plants	Leguminosae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		12/2
plants	land plants	Leguminosae	<i>Macroptilium lathyroides</i>		Y			1/1
plants	land plants	Leguminosae	<i>Medicago polymorpha</i>	burr medic	Y			1/1
plants	land plants	Leguminosae	<i>Medicago scutellata</i>	snail medic	Y			1/1
plants	land plants	Leguminosae	<i>Mirbelia</i>					1/1
plants	land plants	Leguminosae	<i>Mirbelia aotoides</i>			C		1/1
plants	land plants	Leguminosae	<i>Mirbelia pungens</i>			C		1/1
plants	land plants	Leguminosae	<i>Mirbelia speciosa</i> subsp. <i>ringrosei</i>			C		1/1
plants	land plants	Leguminosae	<i>Neptunia gracilis</i>			C		2/2
plants	land plants	Leguminosae	<i>Neptunia gracilis</i> forma <i>gracilis</i>			C		3
plants	land plants	Leguminosae	<i>Parkinsonia aculeata</i>	parkinsonia	Y			7/3
plants	land plants	Leguminosae	<i>Petalostylis labicheoides</i>			C		5/5
plants	land plants	Leguminosae	<i>Pultenaea borea</i>			C		1/1
plants	land plants	Leguminosae	<i>Pultenaea cunninghamii</i>	prickly pea		C		3/3
plants	land plants	Leguminosae	<i>Pultenaea millarii</i>			C		1/1
plants	land plants	Leguminosae	<i>Pultenaea millarii</i> var. <i>millarii</i>			C		6/4
plants	land plants	Leguminosae	<i>Pultenaea paleacea</i>			C		1
plants	land plants	Leguminosae	<i>Pultenaea petiolaris</i>			C		8/5
plants	land plants	Leguminosae	<i>Pultenaea spinosa</i>			C		6/1
plants	land plants	Leguminosae	<i>Rhynchosia minima</i>			C		6/1
plants	land plants	Leguminosae	<i>Rhynchosia minima</i> var. <i>minima</i>			C		3/3
plants	land plants	Leguminosae	<i>Senna aciphylla</i>	Australian senna		C		1/1
plants	land plants	Leguminosae	<i>Senna artemisioides</i>			C		1
plants	land plants	Leguminosae	<i>Senna barclayana</i>			C		2/1
plants	land plants	Leguminosae	<i>Senna occidentalis</i>	coffee senna	Y			1/1
plants	land plants	Leguminosae	<i>Stylosanthes scabra</i>		Y			4/2
plants	land plants	Leguminosae	<i>Tephrosia</i>					1
plants	land plants	Leguminosae	<i>Tephrosia astragaloides</i>			C		2/2
plants	land plants	Leguminosae	<i>Tephrosia dietrichiae</i>			C		1/1
plants	land plants	Leguminosae	<i>Tephrosia filipes</i> subsp. <i>filipes</i>			C		1/1
plants	land plants	Leguminosae	<i>Tephrosia filipes</i> var. (Mt Blackjack A.R.Bean+ 7332)			C		2/2
plants	land plants	Leguminosae	<i>Tephrosia gaudium-solis</i>			C		1/1
plants	land plants	Leguminosae	<i>Tephrosia juncea</i>			C		2/2
plants	land plants	Leguminosae	<i>Vigna lanceolata</i> var. <i>lanceolata</i>			C		1/1
plants	land plants	Leguminosae	<i>Vigna radiata</i> var. <i>sublobata</i>			C		2/1
plants	land plants	Leguminosae	<i>Vigna suberecta</i>			C		1/1
plants	land plants	Leguminosae	<i>Zornia dyctiocarpa</i>			C		1
plants	land plants	Leguminosae	<i>Zornia dyctiocarpa</i> var. <i>filifolia</i>			C		2/2
plants	land plants	Leguminosae	<i>Zornia muriculata</i> subsp. <i>angustata</i>			C		2/2
plants	land plants	Leguminosae	<i>Zornia muriculata</i> subsp. <i>muriculata</i>			C		1/1
plants	land plants	Lentibulariaceae	<i>Utricularia bifida</i>			SL		2
plants	land plants	Lentibulariaceae	<i>Utricularia dichotoma</i> subsp. <i>fontana</i>			C		1/1
plants	land plants	Leucobryaceae	<i>Leucobryum aduncum</i>			C		2/2
plants	land plants	Leucobryaceae	<i>Leucobryum chlorophyllosum</i>			C		1/1

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plants	land plants	Linderniaceae	<i>Lindernia</i>					1/1
plants	land plants	Linderniaceae	<i>Lindernia procumbens</i>			C		1/1
plants	land plants	Lindsaeaceae	<i>Lindsaea microphylla</i>	lacy wedge fern		C		2/1
plants	land plants	Loganiaceae	<i>Logania albiflora</i>			C		4/2
plants	land plants	Loganiaceae	<i>Logania diffusa</i>			V	V	2/2
plants	land plants	Loganiaceae	<i>Mitrasacme alsinoides</i>			C		1/1
plants	land plants	Loganiaceae	<i>Mitrasacme paludosa</i>			C		4/4
plants	land plants	Loganiaceae	<i>Mitrasacme pygmaea</i>			C		1/1
plants	land plants	Loranthaceae	<i>Amyema congener subsp. rotundifolia</i>			C		1/1
plants	land plants	Loranthaceae	<i>Amyema miquelii</i>			C		1/1
plants	land plants	Loranthaceae	<i>Amyema quandang var. bancroftii</i>	broad-leaved grey mistletoe		C		2
plants	land plants	Loranthaceae	<i>Dendrophthoe glabrescens</i>			C		2/2
plants	land plants	Loranthaceae	<i>Lysiana</i>					1
plants	land plants	Loranthaceae	<i>Lysiana filifolia</i>			C		2/2
plants	land plants	Loranthaceae	<i>Lysiana subfalcata</i>			C		6/2
plants	land plants	Lygodiaceae	<i>Lygodium microphyllum</i>	snake fern		C		3/1
plants	land plants	Lythraceae	<i>Ammannia multiflora</i>	jerry-jerry		C		2/2
plants	land plants	Lythraceae	<i>Rotala</i>			C		1
plants	land plants	Lythraceae	<i>Rotala mexicana</i>			C		1/1
plants	land plants	Macarthuriaceae	<i>Macarthuria ephedroides</i>			C		10/8
plants	land plants	Malvaceae	<i>Abelmoschus ficulneus</i>	native rosella		C		2/2
plants	land plants	Malvaceae	<i>Abutilon</i>					1
plants	land plants	Malvaceae	<i>Abutilon auritum</i>	Chinese lantern		C		1
plants	land plants	Malvaceae	<i>Abutilon calliphylllum</i>	velvet lanternflower		C		1/1
plants	land plants	Malvaceae	<i>Abutilon fraseri</i>	dwarf lantern flower		C		1
plants	land plants	Malvaceae	<i>Abutilon fraseri subsp. fraseri</i>			C		1/1
plants	land plants	Malvaceae	<i>Abutilon guineense</i>		Y			1/1
plants	land plants	Malvaceae	<i>Abutilon malvifolium</i>	bastard marshmallow		C		3/1
plants	land plants	Malvaceae	<i>Abutilon nobile</i>			C		2/2
plants	land plants	Malvaceae	<i>Abutilon otoparpum</i>			C		1/1
plants	land plants	Malvaceae	<i>Abutilon oxycarpum</i>			C		3/1
plants	land plants	Malvaceae	<i>Abutilon oxycarpum var. incanum</i>			C		2/2
plants	land plants	Malvaceae	<i>Abutilon oxycarpum var. subsagittatum</i>			C		2
plants	land plants	Malvaceae	<i>Abutilon theophrasti</i>	velvet leaf	Y			1
plants	land plants	Malvaceae	<i>Gossypium australe</i>			C		1/1
plants	land plants	Malvaceae	<i>Gossypium hirsutum</i>		Y			1/1
plants	land plants	Malvaceae	<i>Gossypium sturtianum</i>			C		1/1
plants	land plants	Malvaceae	<i>Hibiscus divaricatus</i>			C		2/2
plants	land plants	Malvaceae	<i>Hibiscus heterophyllus</i>			C		1
plants	land plants	Malvaceae	<i>Hibiscus krichauffianus</i>			C		6/6
plants	land plants	Malvaceae	<i>Hibiscus meraukensis</i>	Merauke hibiscus		C		1/1
plants	land plants	Malvaceae	<i>Hibiscus sp. (Emerald S.L.Everist 2124)</i>			C		3/3
plants	land plants	Malvaceae	<i>Hibiscus sturtii</i>			C		6/3
plants	land plants	Malvaceae	<i>Hibiscus sturtii var. campylochlamys</i>			C		1/1
plants	land plants	Malvaceae	<i>Hibiscus sturtii var. sturtii</i>			C		2
plants	land plants	Malvaceae	<i>Hibiscus tridactylites</i>			C		1

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plants	land plants	Malvaceae	<i>Hibiscus verdcourtii</i>			C		3/3
plants	land plants	Malvaceae	<i>Malvaceae</i>					1
plants	land plants	Malvaceae	<i>Malvastrum americanum</i>		Y			13
plants	land plants	Malvaceae	<i>Malvastrum americanum var. americanum</i>		Y			1/1
plants	land plants	Malvaceae	<i>Malvastrum americanum var. stellatum</i>			C		1/1
plants	land plants	Malvaceae	<i>Sida</i>					1
plants	land plants	Malvaceae	<i>Sida aprica var. aprica</i>			C		2/2
plants	land plants	Malvaceae	<i>Sida atherophora</i>			C		5/3
plants	land plants	Malvaceae	<i>Sida cordifolia</i>		Y			5/3
plants	land plants	Malvaceae	<i>Sida corrugata</i>			C		2
plants	land plants	Malvaceae	<i>Sida fibulifera</i>			C		2/2
plants	land plants	Malvaceae	<i>Sida hackettiana</i>			C		5/2
plants	land plants	Malvaceae	<i>Sida pleiantha</i>			C		1/1
plants	land plants	Malvaceae	<i>Sida rhombifolia</i>		Y			8/1
plants	land plants	Malvaceae	<i>Sida rohlenae</i>			C		2
plants	land plants	Malvaceae	<i>Sida sp. (Charters Towers E.J.Thompson+ CHA456)</i>			C		1/1
plants	land plants	Malvaceae	<i>Sida sp. (Musselbrook M.B.Thomas+ MRS437)</i>			C		3/2
plants	land plants	Malvaceae	<i>Sida spinosa</i>	spiny sida	Y			1/1
plants	land plants	Malvaceae	<i>Sida trichopoda</i>			C		9/1
plants	land plants	Marsileaceae	<i>Marsilea costulifera</i>	narrow-leaved nardoo		C		3/1
plants	land plants	Marsileaceae	<i>Marsilea hirsuta</i>	hairy nardoo		C		5
plants	land plants	Melastomataceae	<i>Melastoma malabathricum subsp. malabathricum</i>			C		1
plants	land plants	Meliaceae	<i>Melia azedarach</i>	white cedar		C		2
plants	land plants	Meliaceae	<i>Owenia acidula</i>	emu apple		C		7/1
plants	land plants	Menispermaceae	<i>Stephania japonica</i>			C		1
plants	land plants	Menyanthaceae	<i>Nymphoides aurantiaca</i>			SL		1/1
plants	land plants	Menyanthaceae	<i>Nymphoides geminata</i>			SL		1
plants	land plants	Molluginaceae	<i>Glinus lotoides</i>	hairy carpet weed		C		1/1
plants	land plants	Molluginaceae	<i>Glinus oppositifolius</i>			C		1/1
plants	land plants	Moraceae	<i>Ficus</i>					1
plants	land plants	Moraceae	<i>Ficus coronata</i>	creek sandpaper fig		C		3
plants	land plants	Moraceae	<i>Ficus opposita</i>			C		2
plants	land plants	Moraceae	<i>Ficus virens var. virens</i>			C		1/1
plants	land plants	Myrsinaceae	<i>Myrsine variabilis</i>			C		1/1
plants	land plants	Myrtaceae	<i>Angophora floribunda</i>	rough-barked apple		C		2
plants	land plants	Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum		C		44/1
plants	land plants	Myrtaceae	<i>Baeckea trapeza</i>			V		4/4
plants	land plants	Myrtaceae	<i>Calytrix tetragona</i>	fringe myrtle		C		6/4
plants	land plants	Myrtaceae	<i>Corymbia</i>					2
plants	land plants	Myrtaceae	<i>Corymbia aureola</i>			C		2/2
plants	land plants	Myrtaceae	<i>Corymbia bunites</i>			C		58/8
plants	land plants	Myrtaceae	<i>Corymbia citriodora subsp. citriodora</i>			C		64
plants	land plants	Myrtaceae	<i>Corymbia citriodora subsp. variegata</i>			C		16
plants	land plants	Myrtaceae	<i>Corymbia clarksoniana</i>			C		5/1
plants	land plants	Myrtaceae	<i>Corymbia dallachiana</i>			C		5/1
plants	land plants	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		15/2

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plants	land plants	Myrtaceae	<i>Corymbia hendersonii</i>			C		19/4
plants	land plants	Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood		C		13/1
plants	land plants	Myrtaceae	<i>Corymbia leichhardtii</i>	rustyjacket		C		4/4
plants	land plants	Myrtaceae	<i>Corymbia leichhardtii</i> x <i>Corymbia tessellaris</i>			C		1/1
plants	land plants	Myrtaceae	<i>Corymbia</i> sp. (<i>Springsure M.I.Brooker 9786</i>)			C		2/2
plants	land plants	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		5
plants	land plants	Myrtaceae	<i>Corymbia trachyphloia</i> subsp. <i>trachyphloia</i>			C		2/1
plants	land plants	Myrtaceae	<i>Corymbia watsoniana</i>			C		1
plants	land plants	Myrtaceae	<i>Corymbia watsoniana</i> subsp. <i>capillata</i>			C		6/4
plants	land plants	Myrtaceae	<i>Corymbia watsoniana</i> subsp. <i>watsoniana</i>			C		2
plants	land plants	Myrtaceae	<i>Eucalyptus</i>					4/2
plants	land plants	Myrtaceae	<i>Eucalyptus acmenoides</i>			C		54/2
plants	land plants	Myrtaceae	<i>Eucalyptus baileyana</i>	Bailey's stringybark		C		16
plants	land plants	Myrtaceae	<i>Eucalyptus bakeri</i>	Baker's mallee		C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus caliginosa</i>	broad-leaved stringybark		C		18
plants	land plants	Myrtaceae	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>			C		2/1
plants	land plants	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		6
plants	land plants	Myrtaceae	<i>Eucalyptus chloroclada</i>	Baradine red gum		C		3
plants	land plants	Myrtaceae	<i>Eucalyptus cloeziana</i>	Gympie messmate		C		6
plants	land plants	Myrtaceae	<i>Eucalyptus coolabah</i>	coolabah		C		18/2
plants	land plants	Myrtaceae	<i>Eucalyptus corynodes</i>			C		3/1
plants	land plants	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		22/2
plants	land plants	Myrtaceae	<i>Eucalyptus decorticans</i>			C		11/1
plants	land plants	Myrtaceae	<i>Eucalyptus eugenioides</i>			C		1
plants	land plants	Myrtaceae	<i>Eucalyptus exserta</i>	Queensland peppermint		C		4/3
plants	land plants	Myrtaceae	<i>Eucalyptus interstans</i>			C		3/3
plants	land plants	Myrtaceae	<i>Eucalyptus longirostrata</i>			C		6
plants	land plants	Myrtaceae	<i>Eucalyptus mediocris</i>			C		2/2
plants	land plants	Myrtaceae	<i>Eucalyptus melanoleuca</i>	Nanango ironbark		C		5/2
plants	land plants	Myrtaceae	<i>Eucalyptus melanophloia</i>			C		56
plants	land plants	Myrtaceae	<i>Eucalyptus melanophloia</i> x <i>Eucalyptus populnea</i>			C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus mensalis</i>			C		3/3
plants	land plants	Myrtaceae	<i>Eucalyptus orgadophila</i>	mountain coolibah		C		7/2
plants	land plants	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		7
plants	land plants	Myrtaceae	<i>Eucalyptus propinqua</i>	small-fruited grey gum		C		4/1
plants	land plants	Myrtaceae	<i>Eucalyptus sphaerocarpa</i>	Blackdown stringybark		C		106/5
plants	land plants	Myrtaceae	<i>Eucalyptus suffulgens</i>			C		29/6
plants	land plants	Myrtaceae	<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany		C		6/4
plants	land plants	Myrtaceae	<i>Eucalyptus tereticornis</i>			C		9
plants	land plants	Myrtaceae	<i>Eucalyptus tereticornis</i> subsp. <i>tereticornis</i>			C		8/1
plants	land plants	Myrtaceae	<i>Eucalyptus tholiformis</i>			C		3/3
plants	land plants	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		2
plants	land plants	Myrtaceae	<i>Harmogia densifolia</i>			C		2/2
plants	land plants	Myrtaceae	<i>Homoranthus brevistylis</i>			CR		2/2
plants	land plants	Myrtaceae	<i>Homoranthus decasetus</i>			C		2/1
plants	land plants	Myrtaceae	<i>Kunzea opposita</i>			C		1

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plants	land plants	Myrtaceae	<i>Kunzea opposita</i> var. <i>leichhardtii</i>			C		2/2
plants	land plants	Myrtaceae	<i>Leptospermum</i>					3/1
plants	land plants	Myrtaceae	<i>Leptospermum brachyandrum</i>	weeping tea-tree		C		6/3
plants	land plants	Myrtaceae	<i>Leptospermum lamellatum</i>			C		27/2
plants	land plants	Myrtaceae	<i>Leptospermum polygalifolium</i>	tantoon		C		7/1
plants	land plants	Myrtaceae	<i>Leptospermum sericatum</i>			C		6/5
plants	land plants	Myrtaceae	<i>Lophostemon confertus</i>	brush box		C		5/1
plants	land plants	Myrtaceae	<i>Lophostemon grandiflorus</i>			C		2
plants	land plants	Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box		C		29/1
plants	land plants	Myrtaceae	<i>Lysicarpus angustifolius</i>	budgeroo		C		50/3
plants	land plants	Myrtaceae	<i>Melaleuca</i>					4/3
plants	land plants	Myrtaceae	<i>Melaleuca bracteata</i>			C		11/2
plants	land plants	Myrtaceae	<i>Melaleuca decora</i>			C		2/1
plants	land plants	Myrtaceae	<i>Melaleuca groveana</i>			NT		3/3
plants	land plants	Myrtaceae	<i>Melaleuca hemisticta</i>			C		1/1
plants	land plants	Myrtaceae	<i>Melaleuca lazaridis</i>			C		7/7
plants	land plants	Myrtaceae	<i>Melaleuca linariifolia</i>	snow-in summer		C		4/1
plants	land plants	Myrtaceae	<i>Melaleuca montis-zamiae</i>			C		2/2
plants	land plants	Myrtaceae	<i>Melaleuca nodosa</i>			C		1/1
plants	land plants	Myrtaceae	<i>Melaleuca pearsonii</i>			NT		10/10
plants	land plants	Myrtaceae	<i>Melaleuca tamariscina</i>			C		4/4
plants	land plants	Myrtaceae	<i>Melaleuca trichostachya</i>			C		6/3
plants	land plants	Myrtaceae	<i>Melaleuca uncinata</i>			C		1
plants	land plants	Myrtaceae	<i>Melaleuca viminalis</i>			C		3/3
plants	land plants	Myrtaceae	<i>Micromyrtus capricornia</i>			C		14/12
plants	land plants	Myrtaceae	<i>Micromyrtus gracilis</i>			C		1/1
plants	land plants	Myrtaceae	<i>Ochrosperma adpressum</i>			C		1/1
plants	land plants	Myrtaceae	<i>Ochrosperma obovatum</i>			V		4/4
plants	land plants	Myrtaceae	<i>Sannantha brachypoda</i>			V		5/4
plants	land plants	Myrtaceae	<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>			C		5/3
plants	land plants	Myrtaceae	<i>Triplarina paludosa</i>			C		11/8
plants	land plants	Nyctaginaceae	<i>Boerhavia</i>					5/1
plants	land plants	Nyctaginaceae	<i>Boerhavia burbidgeana</i>			C		1/1
plants	land plants	Nyctaginaceae	<i>Boerhavia dominii</i>			C		6
plants	land plants	Nyctaginaceae	<i>Boerhavia paludosa</i>			C		1/1
plants	land plants	Nyctaginaceae	<i>Boerhavia pubescens</i>			C		2/1
plants	land plants	Nyctaginaceae	<i>Boerhavia</i> sp. (St George A.Hill AQ399299)			C		1/1
plants	land plants	Olacaceae	<i>Olax stricta</i>			C		2/1
plants	land plants	Olacaceae	<i>Ximenia americana</i>			C		1/1
plants	land plants	Oleaceae	<i>Jasminum</i>					1
plants	land plants	Oleaceae	<i>Jasminum didymum</i>			C		3
plants	land plants	Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>			C		11/1
plants	land plants	Oleaceae	<i>Jasminum didymum</i> subsp. <i>racemosum</i>			C		2
plants	land plants	Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>			C		3/3
plants	land plants	Oleaceae	<i>Notelaea microcarpa</i>			C		3/1
plants	land plants	Oleaceae	<i>Notelaea punctata</i>			C		3

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plants	land plants	Oleaceae	<i>Notelaea</i> sp. (Barakula A.R.Bean 7553)			C		4/3
plants	land plants	Onagraceae	<i>Ludwigia octovalvis</i>	willow primrose		C		1
plants	land plants	Ophioglossaceae	<i>Ophioglossum reticulatum</i>			C		2/1
plants	land plants	Orchidaceae	<i>Caleana major</i>	flying duck orchid		SL		1
plants	land plants	Orchidaceae	<i>Calochilus campestris</i>	copper beard orchid		SL		1/1
plants	land plants	Orchidaceae	<i>Chiloglottis trullata</i>			SL		2/2
plants	land plants	Orchidaceae	<i>Corunastylis valida</i>			V		1/1
plants	land plants	Orchidaceae	<i>Cymbidium canaliculatum</i>			SL		6
plants	land plants	Orchidaceae	<i>Dendrobium speciosum</i>			SL		1/1
plants	land plants	Oxalidaceae	<i>Oxalis</i>					1
plants	land plants	Oxalidaceae	<i>Oxalis corniculata</i>		Y			1/1
plants	land plants	Oxalidaceae	<i>Oxalis exilis</i>			C		2/2
plants	land plants	Oxalidaceae	<i>Oxalis perennans</i>			C		3/3
plants	land plants	Oxalidaceae	<i>Oxalis radicata</i>			C		1/1
plants	land plants	Papaveraceae	<i>Argemone ochroleuca</i>		Y			1
plants	land plants	Passifloraceae	<i>Passiflora aurantia</i> var. <i>aurantia</i>			C		1/1
plants	land plants	Pedaliaceae	<i>Josephinia eugeniae</i>	josephinia burr		C		1/1
plants	land plants	Pentapetaceae	<i>Melhania oblongifolia</i>			C		3/3
plants	land plants	Philydraceae	<i>Philydrum lanuginosum</i>	frogsmouth		C		5/1
plants	land plants	Phrymaceae	<i>Glossostigma diandrum</i>			C		3/3
plants	land plants	Phrymaceae	<i>Peplidium foecundum</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		5/1
plants	land plants	Phyllanthaceae	<i>Bridelia leichhardtii</i>			C		1
plants	land plants	Phyllanthaceae	<i>Flueggea</i>					1
plants	land plants	Phyllanthaceae	<i>Flueggea leucopyrus</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus</i>					2/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus carpentariae</i>			C		4/4
plants	land plants	Phyllanthaceae	<i>Phyllanthus lacunarius</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus maderaspatensis</i>			C		9/5
plants	land plants	Phyllanthaceae	<i>Phyllanthus maderaspatensis</i> var. <i>maderaspatensis</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus mitchellii</i>			C		12/8
plants	land plants	Phyllanthaceae	<i>Phyllanthus simplex</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus</i> sp. (Pentland R.J.Cumming 9742)			C		1/1
plants	land plants	Phyllanthaceae	<i>Phyllanthus virgatus</i>			C		9/5
plants	land plants	Phyllanthaceae	<i>Poranthera microphylla</i>	small poranthera		C		3/2
plants	land plants	Phyllanthaceae	<i>Poranthera obovata</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Synostemon ramosissimus</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Synostemon rhytidospermus</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Synostemon spinosus</i>			C		3/3
plants	land plants	Picrodendraceae	<i>Petalostigma pachyphyllum</i>			C		10/4
plants	land plants	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		13/1
plants	land plants	Picrodendraceae	<i>Pseudanthus orientalis</i>			C		1/1
plants	land plants	Picrodendraceae	<i>Pseudanthus pauciflorus</i> subsp. <i>arenicola</i>			NT		3/2
plants	land plants	Pittosporaceae	<i>Bursaria incana</i>			C		3/2
plants	land plants	Pittosporaceae	<i>Pittosporum angustifolium</i>			C		1
plants	land plants	Pittosporaceae	<i>Pittosporum spinescens</i>			C		6/1

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plants	land plants	Pittosporaceae	<i>Rhytidosporum diosmoides</i>			C		1/1
plants	land plants	Plantaginaceae	<i>Callitriche sonderi</i>			C		1/1
plants	land plants	Plantaginaceae	<i>Gratiola pedunculata</i>			C		1
plants	land plants	Plantaginaceae	<i>Scoparia dulcis</i>	scoparia	Y			2
plants	land plants	Plantaginaceae	<i>Veronica plebeia</i>	trailing speedwell		C		1/1
plants	land plants	Plumbaginaceae	<i>Plumbago zeylanica</i>	native plumbago		C		2
plants	land plants	Poaceae	<i>Alloteropsis cimicina</i>			C		4/4
plants	land plants	Poaceae	<i>Alloteropsis semialata</i>	cockatoo grass		C		1
plants	land plants	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		3/3
plants	land plants	Poaceae	<i>Anthosachne plurinervis</i>			C		2/2
plants	land plants	Poaceae	<i>Aristida</i>					3
plants	land plants	Poaceae	<i>Aristida acuta</i>			C		1
plants	land plants	Poaceae	<i>Aristida annua</i>			V	V	1/1
plants	land plants	Poaceae	<i>Aristida benthamii</i> var. <i>benthamii</i>			C		2/2
plants	land plants	Poaceae	<i>Aristida calycina</i>			C		3
plants	land plants	Poaceae	<i>Aristida calycina</i> var. <i>calycina</i>			C		3/1
plants	land plants	Poaceae	<i>Aristida caput-medusae</i>			C		10/3
plants	land plants	Poaceae	<i>Aristida echinata</i>			C		1/1
plants	land plants	Poaceae	<i>Aristida holathera</i>			C		1
plants	land plants	Poaceae	<i>Aristida holathera</i> var. <i>holathera</i>			C		1/1
plants	land plants	Poaceae	<i>Aristida jerichoensis</i> var. <i>jerichoensis</i>			C		3/2
plants	land plants	Poaceae	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>			C		7/1
plants	land plants	Poaceae	<i>Aristida latifolia</i>	feathertop wiregrass		C		6/4
plants	land plants	Poaceae	<i>Aristida lazaridis</i>			C		2/2
plants	land plants	Poaceae	<i>Aristida leptopoda</i>	white speargrass		C		7/2
plants	land plants	Poaceae	<i>Aristida lignosa</i>			C		1/1
plants	land plants	Poaceae	<i>Aristida personata</i>			C		4/1
plants	land plants	Poaceae	<i>Aristida polyclados</i>			C		3
plants	land plants	Poaceae	<i>Aristida queenslandica</i>			C		2
plants	land plants	Poaceae	<i>Aristida queenslandica</i> var. <i>dissimilis</i>			C		5/4
plants	land plants	Poaceae	<i>Aristida queenslandica</i> var. <i>queenslandica</i>			C		2
plants	land plants	Poaceae	<i>Aristida ramosa</i>	purple wiregrass		C		7/2
plants	land plants	Poaceae	<i>Aristida vagans</i>			C		3
plants	land plants	Poaceae	<i>Arundinella nepalensis</i>	reedgrass		C		7/1
plants	land plants	Poaceae	<i>Astrelba squarrosa</i>	bull mitchell grass		C		4/1
plants	land plants	Poaceae	<i>Austrostipa verticillata</i>	slender bamboo grass		C		1
plants	land plants	Poaceae	<i>Avena ludoviciana</i>		Y			1/1
plants	land plants	Poaceae	<i>Bothriochloa</i>					2
plants	land plants	Poaceae	<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>			C		3/2
plants	land plants	Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>			C		3/1
plants	land plants	Poaceae	<i>Bothriochloa erianthoides</i>	satintop grass		C		9/5
plants	land plants	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass		C		8/1
plants	land plants	Poaceae	<i>Bothriochloa pertusa</i>		Y			4/1
plants	land plants	Poaceae	<i>Brachyachne convergens</i>	common native couch		C		6/2
plants	land plants	Poaceae	<i>Brachyachne tenella</i>			C		1/1
plants	land plants	Poaceae	<i>Calyptochloa gracillima</i> subsp. <i>gracillima</i>			C		1/1

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plants	land plants	Poaceae	<i>Calyptochloa sphaerocarpa</i>			C		6/6
plants	land plants	Poaceae	<i>Capillipedium spicigerum</i>	spicytop		C		1
plants	land plants	Poaceae	<i>Cenchrus</i>					1
plants	land plants	Poaceae	<i>Cenchrus ciliaris</i>		Y			22/3
plants	land plants	Poaceae	<i>Cenchrus polystachios</i>		Y			1/1
plants	land plants	Poaceae	<i>Cenchrus purpureus</i>		Y			1/1
plants	land plants	Poaceae	<i>Chloris divaricata var. divaricata</i>	slender chloris		C		4/3
plants	land plants	Poaceae	<i>Chloris gayana</i>	rhodes grass	Y			1
plants	land plants	Poaceae	<i>Chloris inflata</i>	purpletop chloris	Y			2
plants	land plants	Poaceae	<i>Chloris ventricosa</i>	tall chloris		C		9/3
plants	land plants	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			2/1
plants	land plants	Poaceae	<i>Chrysopogon fallax</i>			C		1
plants	land plants	Poaceae	<i>Chrysopogon sylvaticus</i>			C		1
plants	land plants	Poaceae	<i>Cleistochloa subjuncea</i>			C		5/2
plants	land plants	Poaceae	<i>Cymbopogon bombycinus</i>	silky oilgrass		C		3/1
plants	land plants	Poaceae	<i>Cymbopogon obtectus</i>			C		1
plants	land plants	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		15/2
plants	land plants	Poaceae	<i>Cynodon dactylon</i>		Y			5
plants	land plants	Poaceae	<i>Dactyloctenium australe</i>	sweet smother grass	Y			1
plants	land plants	Poaceae	<i>Dactyloctenium radulans</i>	button grass		C		8/1
plants	land plants	Poaceae	<i>Dichanthium annulatum</i>	sheda grass	Y			1/1
plants	land plants	Poaceae	<i>Dichanthium aristatum</i>	angleton grass	Y			3/3
plants	land plants	Poaceae	<i>Dichanthium fecundum</i>	curly bluegrass		C		2/2
plants	land plants	Poaceae	<i>Dichanthium queenslandicum</i>			V	E	16/15
plants	land plants	Poaceae	<i>Dichanthium sericeum</i>			C		2
plants	land plants	Poaceae	<i>Dichanthium sericeum subsp. humilium</i>			C		2/2
plants	land plants	Poaceae	<i>Dichanthium sericeum subsp. sericeum</i>			C		8/2
plants	land plants	Poaceae	<i>Dichanthium setosum</i>			C	V	6/6
plants	land plants	Poaceae	<i>Dichelachne montana</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria</i>					2
plants	land plants	Poaceae	<i>Digitaria ammophila</i>	silky umbrella grass		C		1/1
plants	land plants	Poaceae	<i>Digitaria bicornis</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria breviglumis</i>			C		2
plants	land plants	Poaceae	<i>Digitaria brownii</i>			C		5/1
plants	land plants	Poaceae	<i>Digitaria diffusa</i>			C		3/1
plants	land plants	Poaceae	<i>Digitaria diminuta</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria divaricatissima</i>	spreading umbrella grass		C		5/3
plants	land plants	Poaceae	<i>Digitaria divaricatissima var. divaricatissima</i>			C		4/4
plants	land plants	Poaceae	<i>Digitaria leucostachya</i>			C		2
plants	land plants	Poaceae	<i>Digitaria orbata</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria parviflora</i>			C		1
plants	land plants	Poaceae	<i>Digitaria porrecta</i>			NT		10/10
plants	land plants	Poaceae	<i>Dimorphochloa rigida</i>			C		1/1
plants	land plants	Poaceae	<i>Dinebra decipiens var. asthenes</i>			C		5/3
plants	land plants	Poaceae	<i>Dinebra decipiens var. decipiens</i>			C		5/2
plants	land plants	Poaceae	<i>Diplachne fusca var. fusca</i>			C		2/1

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plants	land plants	Poaceae	<i>Echinochloa</i>					1
plants	land plants	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	Y			5/2
plants	land plants	Poaceae	<i>Enneapogon cylindricus</i>	jointed nineawn		C		4
plants	land plants	Poaceae	<i>Enneapogon gracilis</i>	slender nineawn		C		5/1
plants	land plants	Poaceae	<i>Enneapogon lindleyanus</i>			C		7/3
plants	land plants	Poaceae	<i>Enneapogon nigricans</i>	niggerheads		C		2
plants	land plants	Poaceae	<i>Enneapogon pallidus</i>	conetop nineawn		C		1/1
plants	land plants	Poaceae	<i>Enneapogon polyphyllus</i>	leafy nineawn		C		1/1
plants	land plants	Poaceae	<i>Enneapogon purpurascens</i>			C		2/1
plants	land plants	Poaceae	<i>Enneapogon truncatus</i>			C		1/1
plants	land plants	Poaceae	<i>Enneapogon virens</i>			C		1
plants	land plants	Poaceae	<i>Enteropogon acicularis</i>	curly windmill grass		C		4
plants	land plants	Poaceae	<i>Enteropogon minutus</i>			C		1/1
plants	land plants	Poaceae	<i>Enteropogon ramosus</i>			C		2/2
plants	land plants	Poaceae	<i>Enteropogon unispiceus</i>			C		9/1
plants	land plants	Poaceae	<i>Entolasia stricta</i>	wiry panic		C		6
plants	land plants	Poaceae	<i>Eragrostis</i>					1/1
plants	land plants	Poaceae	<i>Eragrostis basedowii</i>			C		1
plants	land plants	Poaceae	<i>Eragrostis brownii</i>	Brown's lovegrass		C		6/1
plants	land plants	Poaceae	<i>Eragrostis elongata</i>			C		1
plants	land plants	Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass		C		5/1
plants	land plants	Poaceae	<i>Eragrostis leptostachya</i>			C		3/1
plants	land plants	Poaceae	<i>Eragrostis megalosperma</i>			C		3/2
plants	land plants	Poaceae	<i>Eragrostis minor</i>	smaller stinkgrass	Y			1
plants	land plants	Poaceae	<i>Eragrostis sororia</i>			C		6/2
plants	land plants	Poaceae	<i>Eragrostis trichophora</i>		Y			3/3
plants	land plants	Poaceae	<i>Eremochloa bimaculata</i>	poverty grass		C		2
plants	land plants	Poaceae	<i>Eriachne glabrata</i>			C		1
plants	land plants	Poaceae	<i>Eriachne mucronata forma (Alpha C.E.Hubbard 7882)</i>			C		3/3
plants	land plants	Poaceae	<i>Eriachne pallescens</i>			C		1/1
plants	land plants	Poaceae	<i>Eriachne pallescens var. pallescens</i>			C		2/1
plants	land plants	Poaceae	<i>Eriachne stipacea</i>			C		1
plants	land plants	Poaceae	<i>Eriochloa</i>					1
plants	land plants	Poaceae	<i>Eriochloa crebra</i>	spring grass		C		8/3
plants	land plants	Poaceae	<i>Eriochloa fatmensis</i>			C		1
plants	land plants	Poaceae	<i>Eriochloa procera</i>	slender cupgrass		C		3/3
plants	land plants	Poaceae	<i>Eriochloa pseudoacrotricha</i>			C		5/5
plants	land plants	Poaceae	<i>Eulalia aurea</i>	silky browntop		C		5/1
plants	land plants	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		14/2
plants	land plants	Poaceae	<i>Hyparrhenia hirta</i>	coolati grass	Y			1
plants	land plants	Poaceae	<i>Hyparrhenia rufa subsp. rufa</i>		Y			2/2
plants	land plants	Poaceae	<i>Imperata cylindrica</i>	blady grass		C		3
plants	land plants	Poaceae	<i>Isachne globosa</i>	swamp millet		C		1
plants	land plants	Poaceae	<i>Ischaemum australe</i>			C		2
plants	land plants	Poaceae	<i>Iseilema macratherum</i>			C		1/1
plants	land plants	Poaceae	<i>Iseilema membranaceum</i>	small flinders grass		C		2/2

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plants	land plants	Poaceae	<i>Iseilema vaginiflorum</i>	red flinders grass		C		6/2
plants	land plants	Poaceae	<i>Leptochloa digitata</i>			C		9/3
plants	land plants	Poaceae	<i>Megathyrsus maximus var. pubiglumis</i>		Y			13/3
plants	land plants	Poaceae	<i>Melinis repens</i>	red natal grass	Y			6/1
plants	land plants	Poaceae	<i>Moorochloa eruciformis</i>		Y			4/4
plants	land plants	Poaceae	<i>Ophiuros exaltatus</i>			C		1/1
plants	land plants	Poaceae	<i>Panicum</i>					1
plants	land plants	Poaceae	<i>Panicum decompositum var. decompositum</i>			C		8/3
plants	land plants	Poaceae	<i>Panicum decompositum var. tenuius</i>			C		2
plants	land plants	Poaceae	<i>Panicum effusum</i>			C		9/2
plants	land plants	Poaceae	<i>Panicum larcomianum</i>			C		1
plants	land plants	Poaceae	<i>Panicum queenslandicum var. acuminatum</i>			C		1/1
plants	land plants	Poaceae	<i>Panicum queenslandicum var. queenslandicum</i>			C		6/1
plants	land plants	Poaceae	<i>Paspalidium</i>					6
plants	land plants	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		9/1
plants	land plants	Poaceae	<i>Paspalidium constrictum</i>			C		3/2
plants	land plants	Poaceae	<i>Paspalidium criniforme</i>			C		6/5
plants	land plants	Poaceae	<i>Paspalidium distans</i>	shotgrass		C		2/1
plants	land plants	Poaceae	<i>Paspalidium globoideum</i>	sago grass		C		6/2
plants	land plants	Poaceae	<i>Paspalidium gracile</i>	slender panic		C		1
plants	land plants	Poaceae	<i>Paspalidium jubiflorum</i>	warrego grass		C		1/1
plants	land plants	Poaceae	<i>Paspalum</i>					3
plants	land plants	Poaceae	<i>Paspalum distichum</i>	water couch	Y			1
plants	land plants	Poaceae	<i>Paspalum longifolium</i>			C		2/1
plants	land plants	Poaceae	<i>Paspalum scrobiculatum</i>	ditch millet		C		1
plants	land plants	Poaceae	<i>Perotis rara</i>	comet grass		C		4/2
plants	land plants	Poaceae	<i>Poaceae</i>					2
plants	land plants	Poaceae	<i>Rytidosperma</i>					1
plants	land plants	Poaceae	<i>Sacciolepis indica</i>	Indian cupscale grass		C		1
plants	land plants	Poaceae	<i>Sarga leiocladum</i>			C		2/2
plants	land plants	Poaceae	<i>Schizachyrium fragile</i>	firegrass		C		1/1
plants	land plants	Poaceae	<i>Setaria incrassata</i>		Y			2/2
plants	land plants	Poaceae	<i>Setaria paspalidioides</i>			C		2/2
plants	land plants	Poaceae	<i>Setaria surgens</i>			C		7/3
plants	land plants	Poaceae	<i>Sorghum bicolor</i>	forage sorghum	Y			3/2
plants	land plants	Poaceae	<i>Sorghum halepense</i>	Johnson grass	Y			1/1
plants	land plants	Poaceae	<i>Sorghum x alnum</i>		Y			4/4
plants	land plants	Poaceae	<i>Sporobolus australasicus</i>			C		1
plants	land plants	Poaceae	<i>Sporobolus caroli</i>	fairy grass		C		10/1
plants	land plants	Poaceae	<i>Sporobolus creber</i>			C		7/3
plants	land plants	Poaceae	<i>Sporobolus elongatus</i>			C		3
plants	land plants	Poaceae	<i>Sporobolus mitchellii</i>	rat's tail couch		C		1/1
plants	land plants	Poaceae	<i>Sporobolus scabridus</i>			C		3/3
plants	land plants	Poaceae	<i>Thellungia advena</i>	coolibah grass		C		2/2
plants	land plants	Poaceae	<i>Themeda avenacea</i>			C		2/1
plants	land plants	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		13/1

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plants	land plants	Poaceae	<i>Thyridolepis xerophila</i>			C		3/3
plants	land plants	Poaceae	<i>Tragus australianus</i>	small burr grass		C		8/3
plants	land plants	Poaceae	<i>Triodia mitchellii</i>	buck spinifex		C		12/8
plants	land plants	Poaceae	<i>Triodia pungens</i>			C		2/2
plants	land plants	Poaceae	<i>Tripogon loliiformis</i>	five minute grass		C		1/1
plants	land plants	Poaceae	<i>Urochloa mosambicensis</i>	sabi grass	Y			5
plants	land plants	Poaceae	<i>Urochloa panicoides</i> var. <i>panicoides</i>		Y			3/3
plants	land plants	Poaceae	<i>Urochloa piligera</i>			C		1/1
plants	land plants	Poaceae	<i>Walwhalleya subxerophila</i>			C		1/1
plants	land plants	Polygalaceae	<i>Comesperma</i>					1
plants	land plants	Polygalaceae	<i>Comesperma patentifolium</i>				C	7/5
plants	land plants	Polygalaceae	<i>Comesperma sphaerocarpum</i>				C	3/1
plants	land plants	Polygalaceae	<i>Polygala triflora</i>				C	2/2
plants	land plants	Polygonaceae	<i>Duma florulenta</i>				C	4/2
plants	land plants	Polygonaceae	<i>Polygonum plebeium</i>	small knotweed			C	3/2
plants	land plants	Polygonaceae	<i>Rumex brownii</i>	swamp dock			C	1/1
plants	land plants	Polypodiaceae	<i>Platycerium veitchii</i>	silver elkhorn			SL	1
plants	land plants	Pontederiaceae	<i>Monochoria cyanea</i>				C	3/2
plants	land plants	Portulacaceae	<i>Calandrinia pickeringii</i>				C	1/1
plants	land plants	Portulacaceae	<i>Portulaca australis</i>				C	1/1
plants	land plants	Portulacaceae	<i>Portulaca bicolor</i>				C	4/3
plants	land plants	Portulacaceae	<i>Portulaca filifolia</i>				C	6/2
plants	land plants	Portulacaceae	<i>Portulaca oleracea</i>	pigweed	Y			8
plants	land plants	Portulacaceae	<i>Portulaca pilosa</i>		Y			2
plants	land plants	Pottiaceae	<i>Trichostomum</i>					1/1
plants	land plants	Proteaceae	<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>				C	1
plants	land plants	Proteaceae	<i>Banksia oblongifolia</i>	dwarf banksia			C	5
plants	land plants	Proteaceae	<i>Banksia spinulosa</i>				C	4
plants	land plants	Proteaceae	<i>Banksia spinulosa</i> var. <i>spinulosa</i>				C	1/1
plants	land plants	Proteaceae	<i>Grevillea</i>					1
plants	land plants	Proteaceae	<i>Grevillea cyranostigma</i>				C	1/1
plants	land plants	Proteaceae	<i>Grevillea floribunda</i> subsp. <i>floribunda</i>				C	2/2
plants	land plants	Proteaceae	<i>Grevillea longistyla</i>				C	5/5
plants	land plants	Proteaceae	<i>Grevillea parallela</i>				C	1/1
plants	land plants	Proteaceae	<i>Grevillea sessilis</i>				C	6/4
plants	land plants	Proteaceae	<i>Grevillea singuliflora</i>				C	4/1
plants	land plants	Proteaceae	<i>Hakea</i>					1
plants	land plants	Proteaceae	<i>Hakea benthamii</i>				C	5/2
plants	land plants	Proteaceae	<i>Hakea lorea</i>				C	1
plants	land plants	Proteaceae	<i>Hakea lorea</i> subsp. <i>lorea</i>				C	5/5
plants	land plants	Proteaceae	<i>Hakea purpurea</i>				C	2/2
plants	land plants	Proteaceae	<i>Lomatia silaifolia</i>	crinkle bush			C	4
plants	land plants	Proteaceae	<i>Persoonia falcata</i>				C	7
plants	land plants	Proteaceae	<i>Persoonia subtilis</i>				C	5/4
plants	land plants	Proteaceae	<i>Persoonia terminalis</i> subsp. <i>recurva</i>				C	1/1
plants	land plants	Proteaceae	<i>Petrophile canescens</i>				C	4/1

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plants	land plants	Proteaceae	<i>Stenocarpus salignus</i>	scrub beefwood		C		3/3
plants	land plants	Proteaceae	<i>Xylomelum cunninghamianum</i>			C		6
plants	land plants	Pteridaceae	<i>Cheilanthes</i>					1
plants	land plants	Pteridaceae	<i>Cheilanthes distans</i>	bristly cloak fern		C		1
plants	land plants	Pteridaceae	<i>Cheilanthes sieberi subsp. sieberi</i>			C		2/1
plants	land plants	Pteridaceae	<i>Pellaea</i>					1/1
plants	land plants	Ranunculaceae	<i>Clematis glycinoides</i>			C		1/1
plants	land plants	Restionaceae	<i>Baloskion pallens</i>			C		2/1
plants	land plants	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		8
plants	land plants	Rhamnaceae	<i>Cryptandra propinqua</i>			C		1/1
plants	land plants	Rhamnaceae	<i>Polianthion minutiflorum</i>			V	V	2/2
plants	land plants	Rhamnaceae	<i>Pomaderris lanigera</i>			C		1
plants	land plants	Rhamnaceae	<i>Ventilago viminalis</i>	supplejack		C		8/2
plants	land plants	Rubiaceae	<i>Asperula conferta</i>			C		1/1
plants	land plants	Rubiaceae	<i>Coelospermum reticulatum</i>			C		2/1
plants	land plants	Rubiaceae	<i>Dentella repens</i>	dentella		C		1/1
plants	land plants	Rubiaceae	<i>Dolichocarpa coerulescens</i>			C		3/3
plants	land plants	Rubiaceae	<i>Everistia vacciniifolia var. vacciniifolia</i>			C		5/5
plants	land plants	Rubiaceae	<i>Larsenaikia ochreata</i>			C		2/2
plants	land plants	Rubiaceae	<i>Opercularia diphylla</i>			C		1/1
plants	land plants	Rubiaceae	<i>Paranotis mitrasacmoides subsp. trachymenoides</i>			C		2/2
plants	land plants	Rubiaceae	<i>Pomax umbellata</i>			C		6/2
plants	land plants	Rubiaceae	<i>Psychotria</i>					1
plants	land plants	Rubiaceae	<i>Psychotria daphnoides</i>			C		1
plants	land plants	Rubiaceae	<i>Psydrax forsteri</i>			C		2/2
plants	land plants	Rubiaceae	<i>Psydrax johnsonii</i>			C		2
plants	land plants	Rubiaceae	<i>Psydrax odorata</i>			C		4
plants	land plants	Rubiaceae	<i>Psydrax odorata forma buxifolia</i>			C		2
plants	land plants	Rubiaceae	<i>Psydrax odorata forma subnitida</i>			C		2/2
plants	land plants	Rubiaceae	<i>Psydrax odorata subsp. australiana</i>			C		1/1
plants	land plants	Rubiaceae	<i>Psydrax oleifolia</i>			C		1
plants	land plants	Rubiaceae	<i>Richardia brasiliensis</i>	white eye	Y			1/1
plants	land plants	Rubiaceae	<i>Scleromitron galioides</i>			C		1/1
plants	land plants	Rubiaceae	<i>Spermacoce</i>					1
plants	land plants	Rubiaceae	<i>Spermacoce brachystema</i>			C		3/3
plants	land plants	Rubiaceae	<i>Spermacoce multicaulis</i>			C		2/2
plants	land plants	Rubiaceae	<i>Spermacoce sp. (Dislyn A.R.Bean 14098)</i>			C		2/2
plants	land plants	Rubiaceae	<i>Synaptantha tillaeacea var. tillaeacea</i>			C		1/1
plants	land plants	Rutaceae	<i>Acronychia pauciflora</i>	soft acronychia		C		1/1
plants	land plants	Rutaceae	<i>Boronia</i>					1
plants	land plants	Rutaceae	<i>Boronia duiganiae</i>			C		8/8
plants	land plants	Rutaceae	<i>Boronia obovata</i>			C		30/21
plants	land plants	Rutaceae	<i>Boronia odorata</i>			C		1/1
plants	land plants	Rutaceae	<i>Boronia splendida</i>			C		2/2
plants	land plants	Rutaceae	<i>Citrus glauca</i>			C		8/4
plants	land plants	Rutaceae	<i>Cyanothamnus bipinnatus</i>			C		3/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Rutaceae	<i>Cyanothamnus occidentalis</i>			C		3/3
plants	land plants	Rutaceae	<i>Dinosperma erythrococtum</i>			C		1/1
plants	land plants	Rutaceae	<i>Flindersia dissosperma</i>			C		7/5
plants	land plants	Rutaceae	<i>Geijera parviflora</i>	wilga		C		16/4
plants	land plants	Rutaceae	<i>Geijera salicifolia</i>	brush wilga		C		1
plants	land plants	Rutaceae	<i>Phebalium glandulosum subsp. glandulosum</i>			C		2/2
plants	land plants	Rutaceae	<i>Phebalium nottii</i>	pink phebalium		C		6/3
plants	land plants	Rutaceae	<i>Phebalium woombye</i>	wallum phebalium		C		1/1
plants	land plants	Rutaceae	<i>Philotheca difformis subsp. difformis</i>			C		10/9
plants	land plants	Rutaceae	<i>Zieria aspalathoides subsp. aspalathoides</i>			C		3/3
plants	land plants	Rutaceae	<i>Zieria fraseri subsp. robusta</i>			C		1/1
plants	land plants	Rutaceae	<i>Zieria smithii</i>			C		1/1
plants	land plants	Salviniaceae	<i>Azolla</i>					1
plants	land plants	Santalaceae	<i>Exocarpos cupressiformis</i>	native cherry		C		1
plants	land plants	Santalaceae	<i>Santalum lanceolatum</i>			SL		7/2
plants	land plants	Sapindaceae	<i>Alectryon connatus</i>	grey birds-eye		C		1
plants	land plants	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		16/1
plants	land plants	Sapindaceae	<i>Alectryon oleifolius subsp. elongatus</i>			C		4
plants	land plants	Sapindaceae	<i>Atalaya hemiglauca</i>			C		11
plants	land plants	Sapindaceae	<i>Cardiospermum halicacabum var. halicacabum</i>		Y			1/1
plants	land plants	Sapindaceae	<i>Dodonaea</i>					5/3
plants	land plants	Sapindaceae	<i>Dodonaea filifolia</i>			C		4/1
plants	land plants	Sapindaceae	<i>Dodonaea lanceolata var. subsessilifolia</i>			C		1/1
plants	land plants	Sapindaceae	<i>Dodonaea peduncularis</i>			C		7/3
plants	land plants	Sapindaceae	<i>Dodonaea stenophylla</i>			C		2/1
plants	land plants	Sapindaceae	<i>Dodonaea triangularis</i>			C		5/1
plants	land plants	Sapindaceae	<i>Dodonaea vestita</i>			C		7/2
plants	land plants	Sapindaceae	<i>Dodonaea viscosa subsp. angustissima</i>			C		1
plants	land plants	Sapindaceae	<i>Dodonaea viscosa subsp. spatulata</i>			C		4
plants	land plants	Scrophulariaceae	<i>Eremophila debilis</i>	winter apple		C		4/1
plants	land plants	Scrophulariaceae	<i>Eremophila latrobei</i>			C		1/1
plants	land plants	Scrophulariaceae	<i>Eremophila latrobei subsp. glabra</i>			C		7/7
plants	land plants	Scrophulariaceae	<i>Eremophila latrobei subsp. latrobei</i>			C		2/2
plants	land plants	Scrophulariaceae	<i>Eremophila longifolia</i>	berrigan		C		1/1
plants	land plants	Scrophulariaceae	<i>Eremophila mitchellii</i>			C		9/2
plants	land plants	Scrophulariaceae	<i>Myoporum acuminatum</i>	coastal boobialla		C		4
plants	land plants	Selaginellaceae	<i>Selaginella</i>					1/1
plants	land plants	Solanaceae	<i>Datura leichhardtii</i>	native thornapple	Y			3/3
plants	land plants	Solanaceae	<i>Nicotiana megalosiphon</i>			C		2/1
plants	land plants	Solanaceae	<i>Physalis angulata</i>		Y			1/1
plants	land plants	Solanaceae	<i>Physalis lanceifolia</i>		Y			3/3
plants	land plants	Solanaceae	<i>Solanum</i>					2
plants	land plants	Solanaceae	<i>Solanum americanum</i>		Y			3/3
plants	land plants	Solanaceae	<i>Solanum cocosoides</i>			C		5/5
plants	land plants	Solanaceae	<i>Solanum dissectum</i>			E	E	3/3
plants	land plants	Solanaceae	<i>Solanum elachophyllum</i>			E		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Solanaceae	<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Y			1
plants	land plants	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		10/6
plants	land plants	Solanaceae	<i>Solanum esuriale</i>	quena		C		2/1
plants	land plants	Solanaceae	<i>Solanum ferocissimum</i>			C		2/1
plants	land plants	Solanaceae	<i>Solanum mitchellianum</i>			C		4/4
plants	land plants	Solanaceae	<i>Solanum pusillum</i>			C		2/2
plants	land plants	Solanaceae	<i>Solanum seaforthianum</i>	Brazilian nightshade	Y			3
plants	land plants	Solanaceae	<i>Solanum semiarmatum</i>	prickly nightshade		C		1
plants	land plants	Sparrmanniaceae	<i>Corchorus tomentellus</i>			C		6/6
plants	land plants	Sparrmanniaceae	<i>Corchorus trilocularis</i>			C		3/3
plants	land plants	Sparrmanniaceae	<i>Grewia latifolia</i>	dysentery plant		C		8/1
plants	land plants	Sparrmanniaceae	<i>Grewia scabrella</i>			C		7/3
plants	land plants	Sphagnaceae	<i>Sphagnum perichaetiale</i>			C		2/2
plants	land plants	Stackhousiaceae	<i>Stackhousia muricata</i>			C		2/1
plants	land plants	Sterculiaceae	<i>Brachychiton australis</i>	broad-leaved bottle tree		SL		3
plants	land plants	Sterculiaceae	<i>Brachychiton populneus</i>			C		1
plants	land plants	Sterculiaceae	<i>Brachychiton populneus subsp. trilobus</i>			SL		1/1
plants	land plants	Sterculiaceae	<i>Brachychiton rupestris</i>			SL		13/2
plants	land plants	Sterculiaceae	<i>Brachychiton x turgidulus</i>			SL		1/1
plants	land plants	Sterculiaceae	<i>Sterculia quadrifida</i>	peanut tree		C		1
plants	land plants	Stylidiaceae	<i>Stylidium debile</i>	frail trigger plant		SL		5/2
plants	land plants	Stylidiaceae	<i>Stylidium eglandulosum</i>			SL		3/3
plants	land plants	Stylidiaceae	<i>Stylidium eriorhizum</i>			SL		4/3
plants	land plants	Stylidiaceae	<i>Stylidium laricifolium</i>	tree trigger plant		SL		1/1
plants	land plants	Surianaceae	<i>Cadellia pentastylis</i>	ooline		V	V	3/3
plants	land plants	Thelypteridaceae	<i>Christella dentata</i>	creek fern		SL		1
plants	land plants	Thymelaeaceae	<i>Pimelea decora</i>			C		2
plants	land plants	Thymelaeaceae	<i>Pimelea haematostachya</i>			C		3/2
plants	land plants	Thymelaeaceae	<i>Pimelea linifolia</i>			C		2/1
plants	land plants	Thymelaeaceae	<i>Pimelea linifolia subsp. linifolia</i>			C		2/2
plants	land plants	Thymelaeaceae	<i>Pimelea strigosa</i>			C		1/1
plants	land plants	Verbenaceae	<i>Glandularia aristigera</i>		Y			1
plants	land plants	Verbenaceae	<i>Phyla canescens</i>		Y			1/1
plants	land plants	Verbenaceae	<i>Verbena</i>					4/1
plants	land plants	Verbenaceae	<i>Verbena africana</i>			C		3/3
plants	land plants	Verbenaceae	<i>Verbena bonariensis</i>	purpletop	Y			1
plants	land plants	Verbenaceae	<i>Verbena macrostachya</i>			C		1/1
plants	land plants	Verbenaceae	<i>Verbena rigida</i>		Y			1/1
plants	land plants	Violaceae	<i>Pigea enneasperma</i>			C		4/3
plants	land plants	Violaceae	<i>Pigea stellarioides</i>			C		2/1
plants	land plants	Viscaceae	<i>Notothixos incanus</i>			C		1/1
plants	land plants	Viscaceae	<i>Viscum articulatum</i>	flat mistletoe		C		1/1
plants	land plants	Vitaceae	<i>Clematicissus opaca</i>			C		6/2
plants	land plants	Xanthorrhoeaceae	<i>Xanthorrhoea</i>					1
plants	land plants	Xanthorrhoeaceae	<i>Xanthorrhoea johnsonii</i>			SL		10
plants	land plants	Xyridaceae	<i>Xyris complanata</i>	yellow-eye		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Zamiaceae	<i>Macrozamia moorei</i>			SL		16/9
plants	land plants	Zamiaceae	<i>Macrozamia platyrhachis</i>			E	E	27/18
plants	land plants	Zygophyllaceae	<i>Roepera apiculata</i>			C		2/2
plants	land plants	Zygophyllaceae	<i>Tribulus eichlerianus</i>	bull head		C		3
plants	land plants	Zygophyllaceae	<i>Tribulus micrococcus</i>	yellow vine		C		3/3
plants	land plants	Zygophyllaceae	<i>Tribulus terrestris</i>	caltrop		C		1
plants	uncertain	Indet.	<i>Indet.</i>			C		6
plants		Caesalpinioideae	<i>Haematoxylum campechianum</i>	logwood tree	Y			2/2
plants		Caesalpinioideae	<i>Senna artemisioides subsp. artemisioides</i>			C		1/1
plants		Mimosoid clade	<i>Acacia melanoxylon</i>	blackwood		C		3
plants		Mimosoid clade	<i>Acacia oswaldii</i>	miljee		C		3/1
plants		Mimosoid clade	<i>Acacia resinicostata</i>			C		3
plants		Mimosoid clade	<i>Acacia victoriae subsp. victoriae</i>			C		1/1
plants		Mimosoid clade	<i>Leucaena leucocephala</i>		Y			1
plants		Mimosoid clade	<i>Neptunia heliophila</i>			C		4/4
plants		Mimosoid clade	<i>Vachellia farnesiana</i>		Y			3/1
plants		Papilionoideae	<i>Gompholobium pinnatum</i>	poor mans gold		C		1
plants		Papilionoideae	<i>Hovea longipes</i>	brush hovea		C		7/4
plants		Papilionoideae	<i>Leptosema chapmanii</i>			C		5/5
plants		Papilionoideae	<i>Mirbelia rubiifolia</i>	heathy mirbelia		C		1
plants		Papilionoideae	<i>Phyllota phyllicoides</i>	yellow peabush		C		2/2
plants		Papilionoideae	<i>Sesbania cannabina</i>			C		2/1
plants		Papilionoideae	<i>Swainsona galegifolia</i>	smooth Darling pea		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.



Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
epp: 2048

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

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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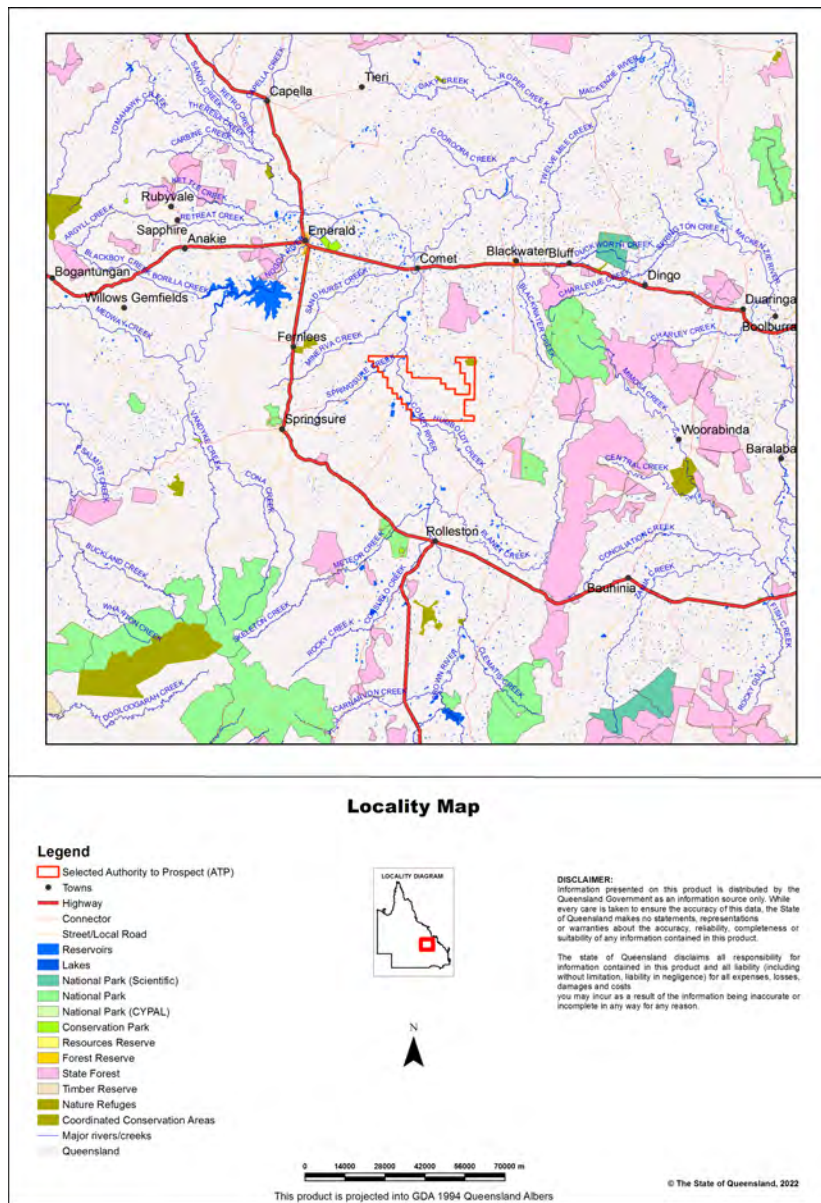
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Assessment Area Details

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 epp: 2048

Size (ha)	45,082.88
Local Government(s)	Central Highlands Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Isaac - Comet Downs, Basalt Downs
Catchment(s)	Fitzroy



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	669.13 ha	1.5%
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)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	375.78 ha	0.8%
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	3549.87 ha	7.9%
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)	4170.43 ha	9.3%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	434.45 ha	1.0%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	61.79 ha	0.1%
8d Regulated Vegetation - Essential habitat	3040.84 ha	6.7%
8e Regulated Vegetation - intersecting a watercourse	261.5 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	361.73 ha	0.8%
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

Name
Kenmare Nature Refuge

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)

(no results)

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

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

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

Values are present

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

Scientific name	Common name	NCA status	EPBC status	Migratory status
<i>Phascolarctos cinereus</i>	koala	E	E	

Scientific name	Common name	NCA status	EPBC status	Migratory status
<i>Rostratula australis</i>	Australian painted-snipe	E	E	

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)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.4.9	E-dom	rem_end
11.5.3/11.5.16	E-subdom	rem_end
11.5.3/11.4.8	E-subdom	rem_end
11.5.16	E-dom	rem_end
11.3.1/11.3.3	E-dom	rem_end
11.3.1	E-dom	rem_end
11.3.25/11.3.3	O-subdom	rem_oc
11.4.9a	E-dom	rem_end
11.4.8	E-dom	rem_end
11.3.3/11.3.1	E-subdom	rem_end

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.8.11	O-dom	rem_oc
11.3.2/11.3.25	O-dom	rem_oc
11.5.9b/11.5.18	O-subdom	rem_oc
11.4.9/11.4.8	E-dom	rem_end
11.5.10	O-dom	rem_oc
11.9.5	E-dom	rem_end
11.3.2	O-dom	rem_oc
11.9.7/11.9.1	E-subdom	rem_end
11.9.1	E-dom	rem_end
11.3.3	O-dom	rem_oc
11.8.4/11.8.5/11.8.11	O-subdom	rem_oc
11.3.11	E-dom	rem_end

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.5.3/11.4.8	E-subdom	hvr_end
11.5.9b/11.5.18	O-subdom	hvr_oc
11.3.1/11.3.3	E-dom	hvr_end
11.4.8	E-dom	hvr_end
11.5.16	E-dom	hvr_end
11.4.9	E-dom	hvr_end
11.5.10	O-dom	hvr_oc
11.5.3/11.5.16	E-subdom	hvr_end
11.9.5	E-dom	hvr_end
11.4.9/11.4.8	E-dom	hvr_end

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

Regulated vegetation map category	Map number
R	8550
R	8649
R	8549
R	8650

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

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

Regulated vegetation map category	Map number
R	8649
B	8649
B	8650
C	8650
B	8550
A	8650

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

MSES - Offsets**9a. Legally secured offset areas - offset register areas**

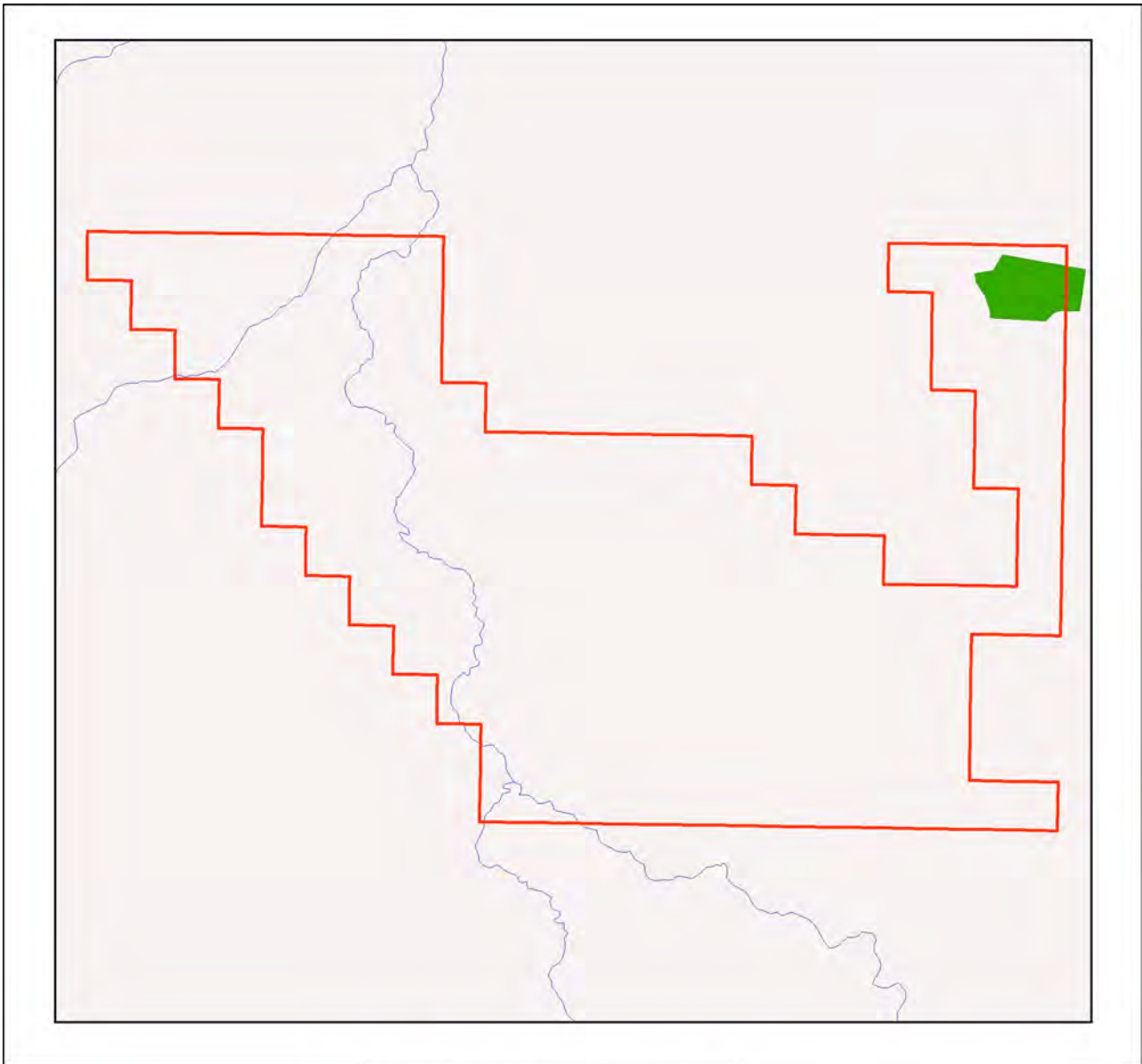
(no results)

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.

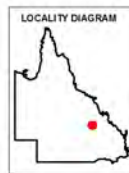
Map 1 - MSES - State Conservation Areas



MSES - State Conservation Areas

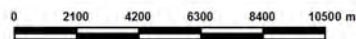
Area of Interest

- Selected Authority to Prospect (ATP)
- 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)



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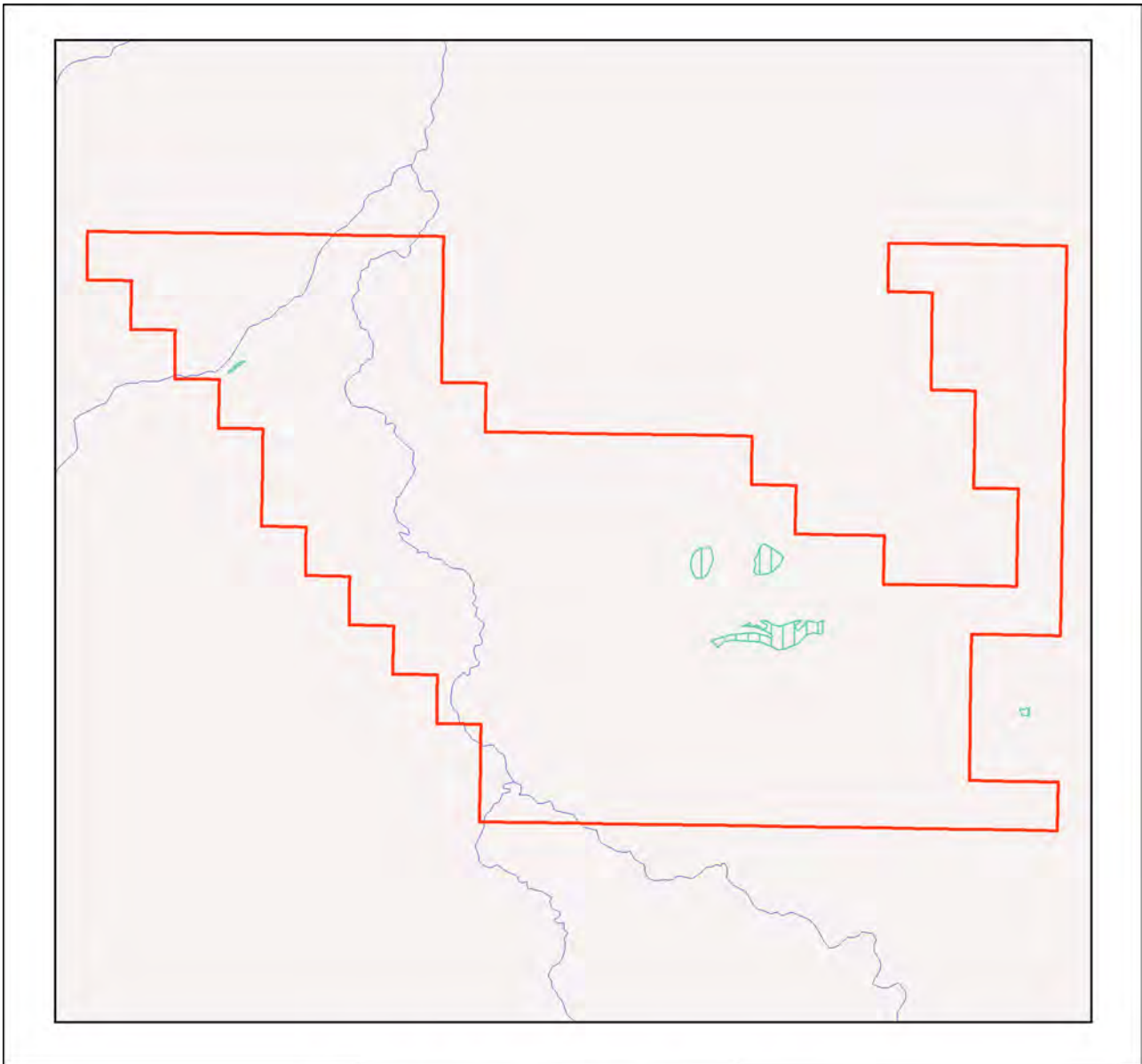
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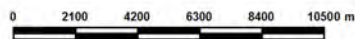
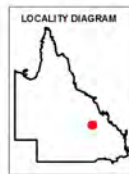
Map 2 - MSES - Wetlands and Waterways



MSES - Wetlands and Waterways

Area of Interest

- Selected Authority to Prospect (ATP)
- 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



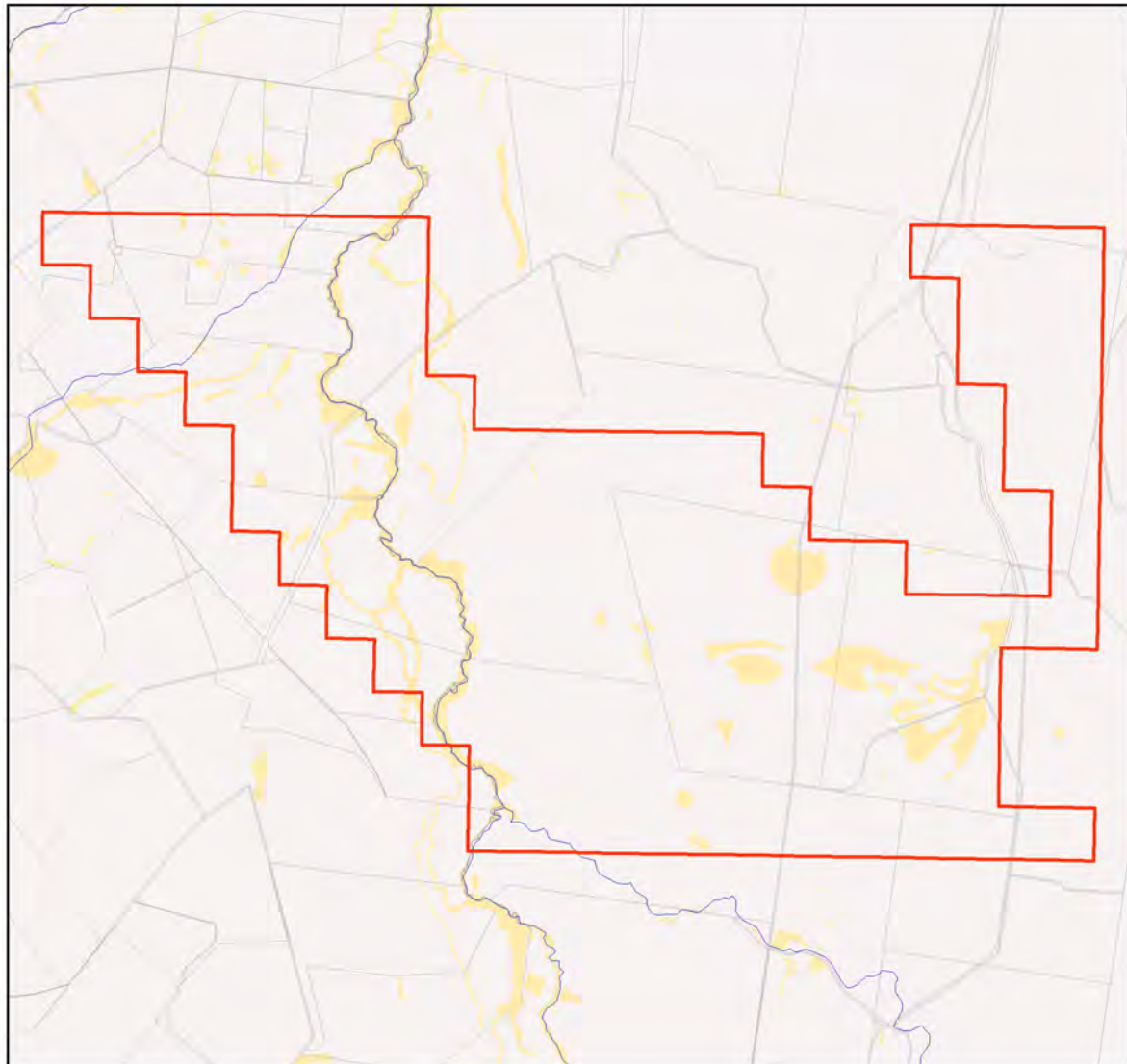
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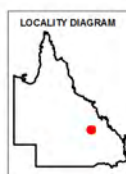
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



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

Area of Interest

- Selected Authority to Prospect (ATP)
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)



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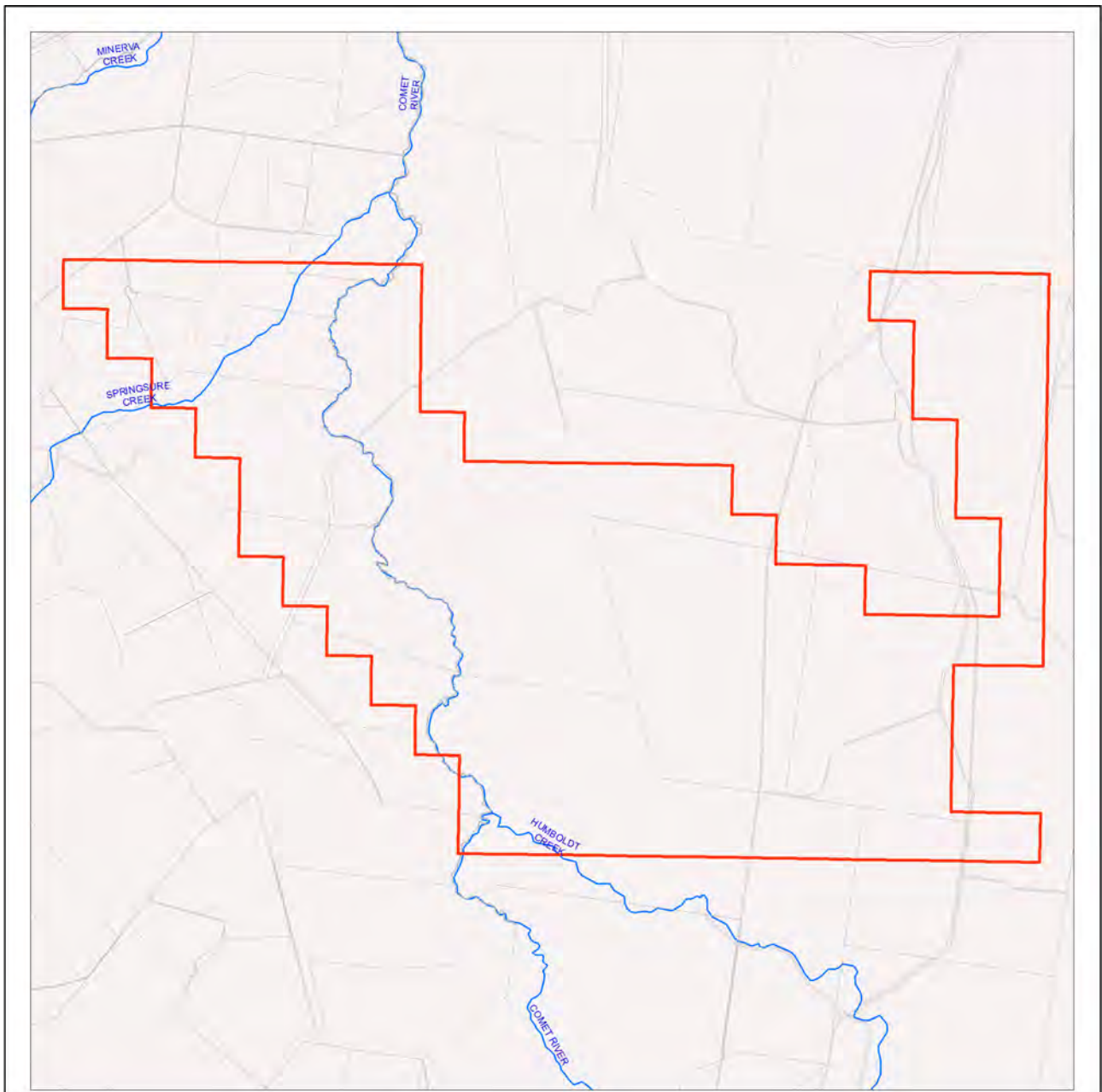
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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species Koala habitat area (SEQ)

Area of Interest

- Selected Authority to Prospect (ATP)
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)



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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>

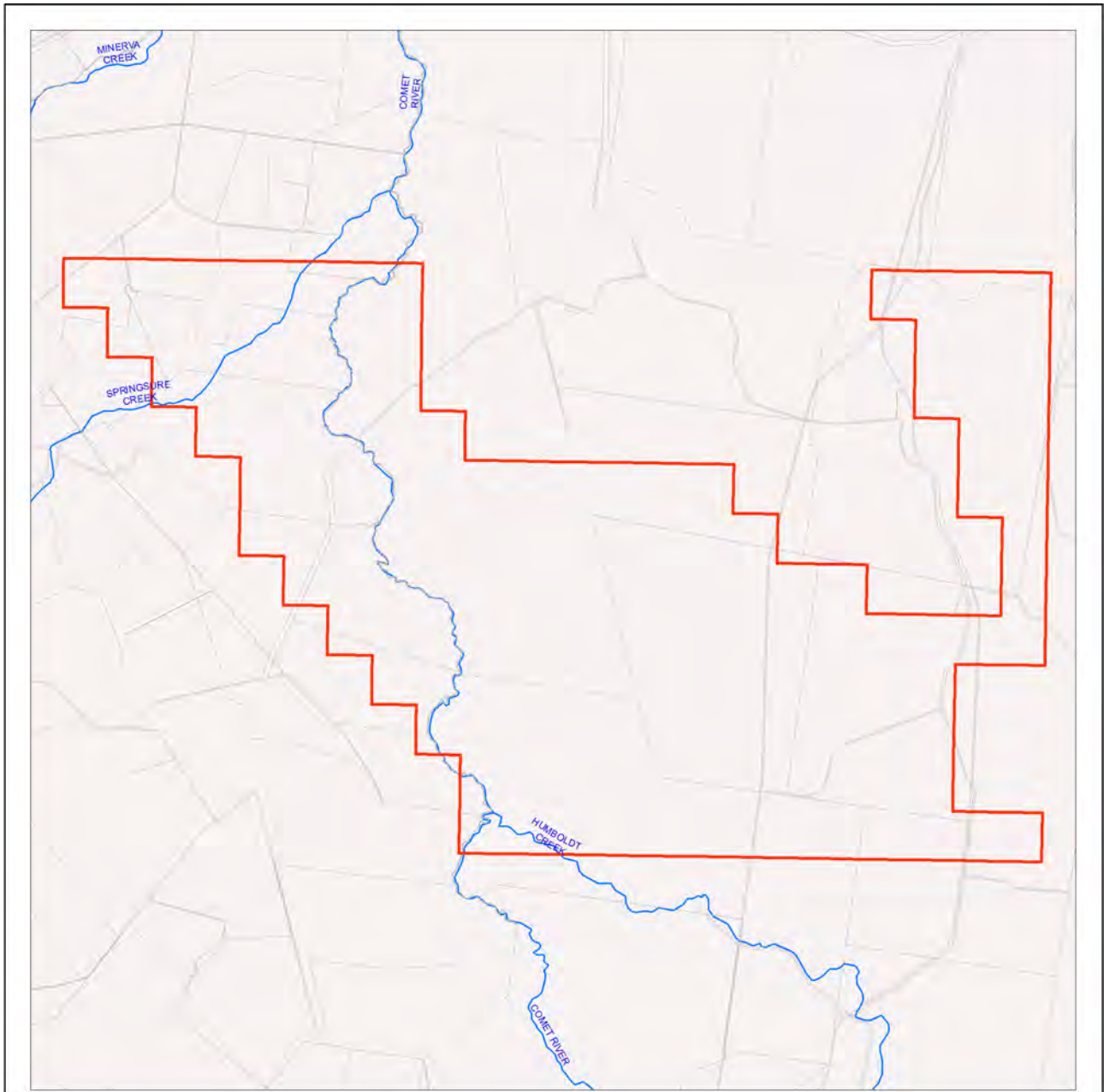
The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.



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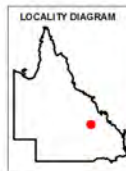
Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)



MSES - Wildlife habitat (sea turtle nesting areas)

Area of Interest

- Selected Authority to Prospect (ATP)
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (sea turtle nesting areas)

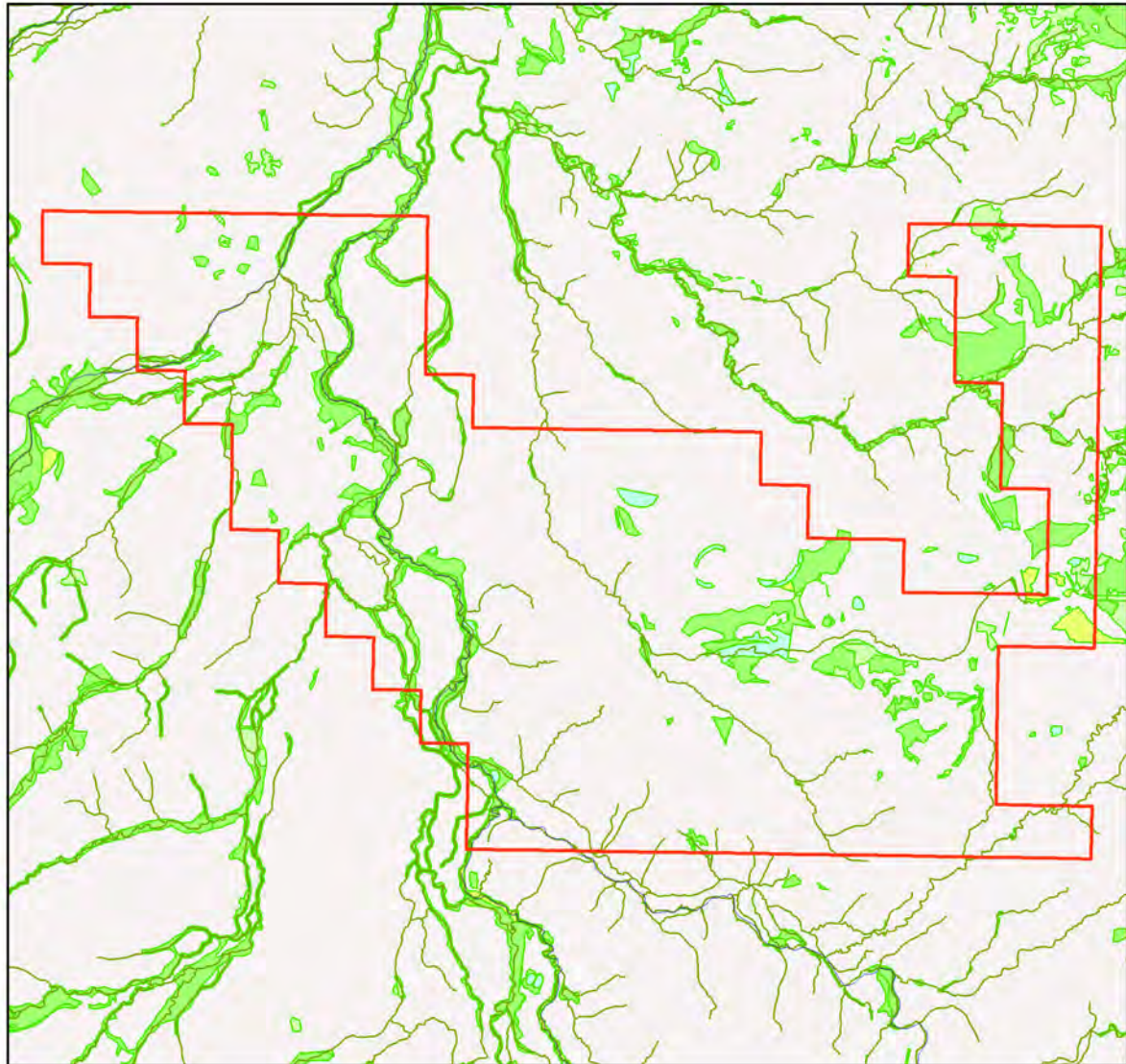


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MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise 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.



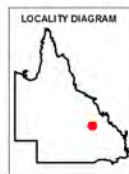
Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

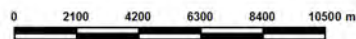
Area of Interest

- Selected Authority to Prospect (ATP)
- 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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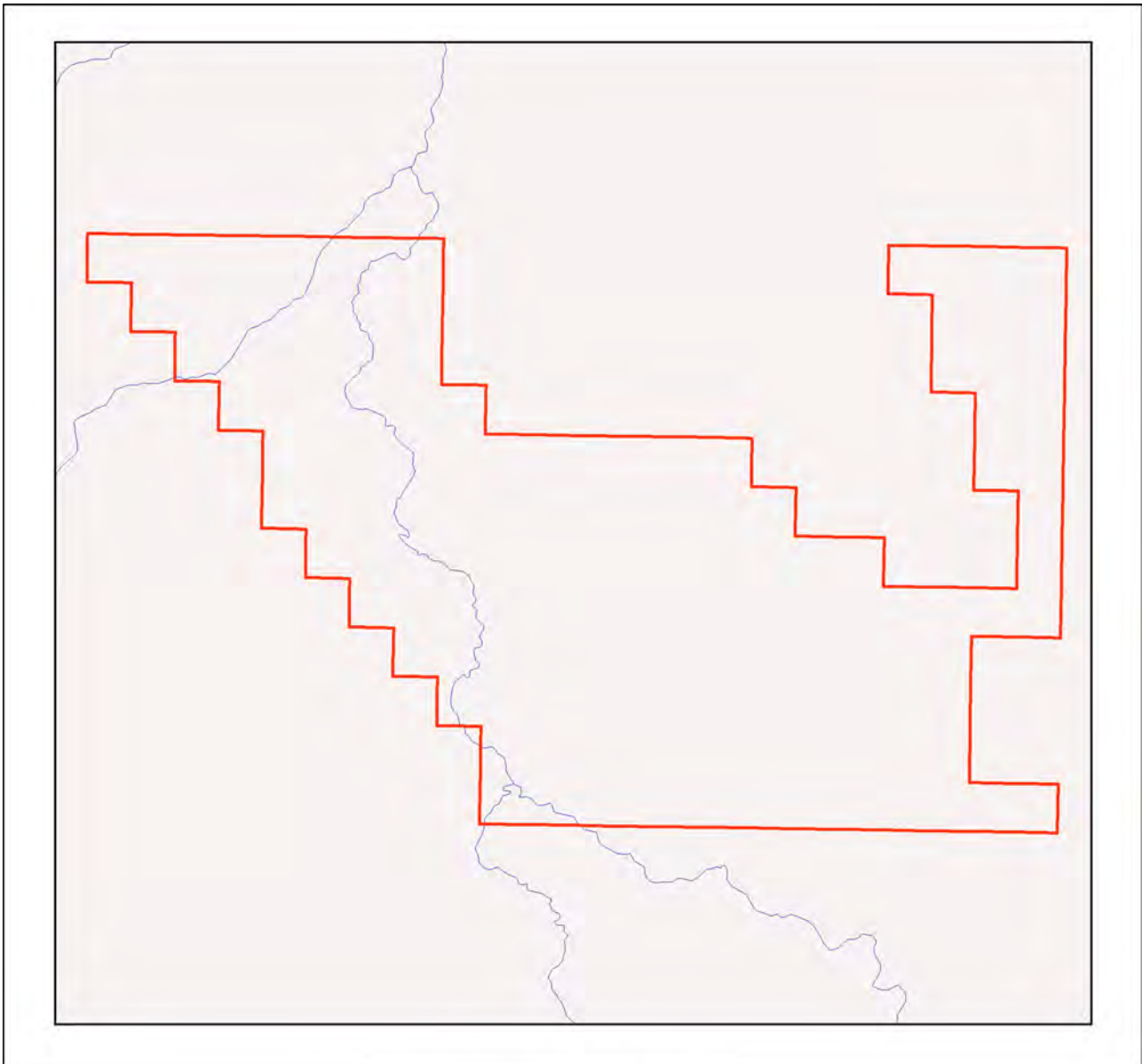
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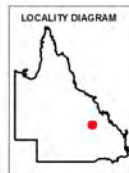
Map 5 - MSES - Offset Areas



MSES - Offsets

Area of Interest

- Selected Authority to Prospect (ATP)
- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)



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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

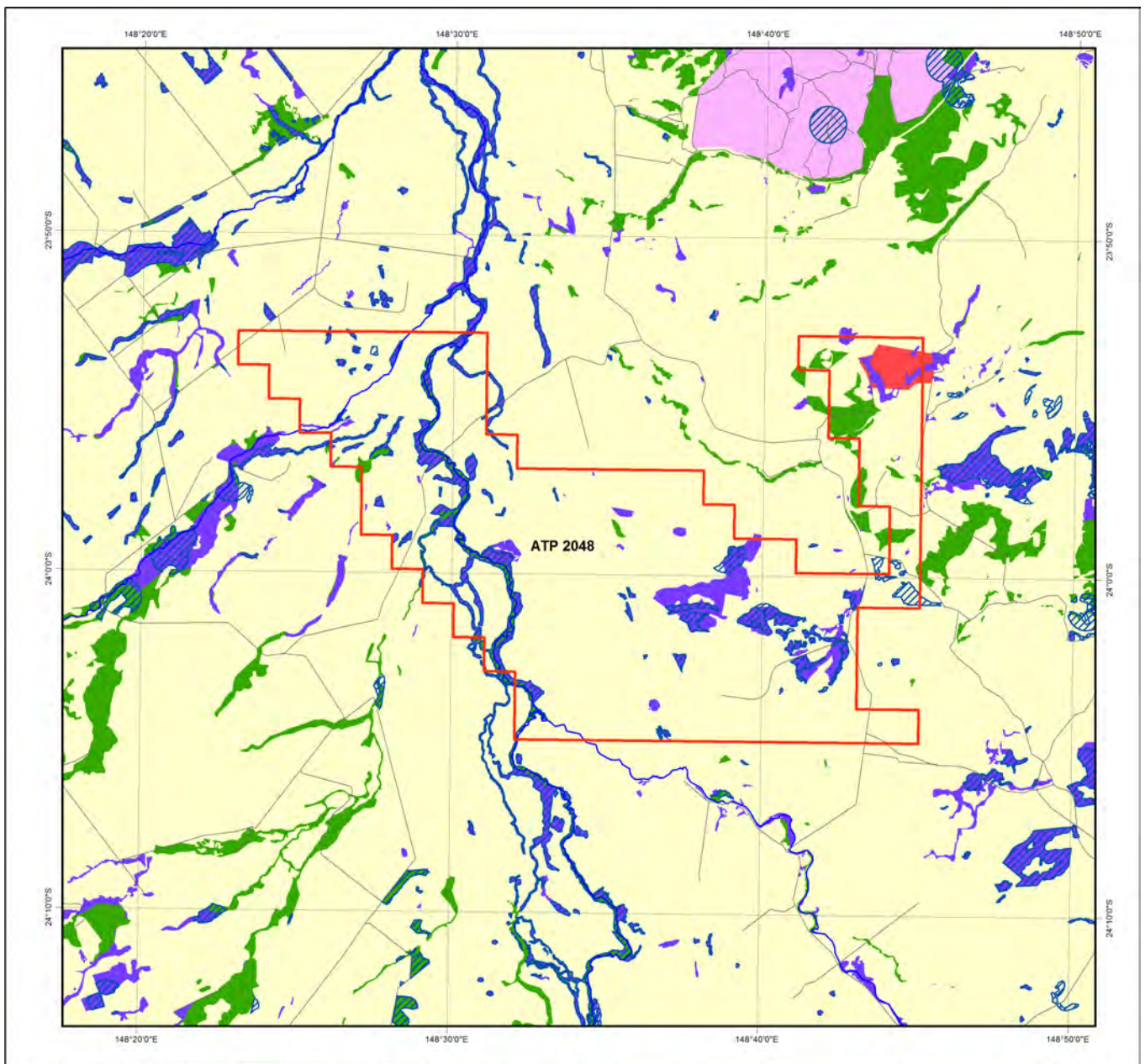
Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying 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	- <i>Environmental Protection Act 1994</i>
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	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>

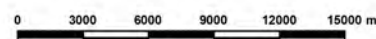
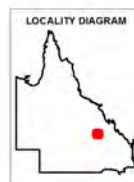


ENVIRONMENTALLY SENSITIVE AREAS - non-mining resource activities (EP Act)

- Selected Authority to Prospect (ATP)
- CATEGORY A**
- National Parks
- Conservation Parks
- Forest Reserves
- Special Wildlife Reserve
- Wet Tropics World Heritage Area
- Great Barrier Reef Marine Park Area
- Marine Parks other than General Use Zones
- CATEGORY B**
- Queensland Heritage Register Places
- Ramsar Sites
- Cultural Heritage Registered Areas and DLA's other than Stanbroke
- Special Forestry Areas
- Seaward Side of Highest Astronomical Tide
- Fish Habitat Areas
- Coordinated Conservation Areas
- Endangered Regional Ecosystems - regrowth and remnant (Biodiversity Status)
- General Use Zones of Marine Parks
- Marine Plants
- CATEGORY C**
- Essential Habitat
- Koala Plan
- Nature Refuges
- Resources Reserve
- State Forests
- Timber Reserves
- Of Concern Regional Ecosystems (remnant biodiversity status)
- OTHERS**
- Towns
- Roads
- Rivers
- Springs
- Queensland

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NOTE TO USER: Themes presented in this map are indicative only. Field survey may be required to verify the 'true' spatial extent and value. Not all environmentally sensitive areas are presented in this map. A user should refer to the particular circumstances relevant to their situation to assess the 'completeness' of themes provided.

The user should note that some boundaries and indicated values are ambient or subject to change over time (e.g. regional ecosystem boundaries and conservation status, watercourse mapping etc).

The user should be aware that due to multiple overlapping themes present, some themes/layers may be obscured by others. Ordering in the Legend does not accurately reflect the order by which themes are displayed.



Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
epp: 2048

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

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Summary Information

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

Table 1: Area of interest details: epp: 2048

Size (ha)	45,082.88
Local Government(s)	Central Highlands Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Isaac - Comet Downs, Basalt Downs
Catchment(s)	Fitzroy

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

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

Biodiversity Status	Area (Ha)	% of AOI
Endangered	1,532.33	3.4
Of concern	2,190.66	4.86
No concern at present	4,938.90	10.96
Total remnant vegetation	8,661.89	19.21

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

Regional Ecosystems

1. Introduction

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

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

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

<https://www.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
11.3.1	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Endangered	633.97	1.41
11.3.11	Semi-evergreen vine thicket on alluvial plains	Endangered	4.74	0.01
11.3.2	Eucalyptus populnea woodland on alluvial plains	Of concern	103.94	0.23
11.3.25	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Of concern	546.96	1.21
11.3.3	Eucalyptus coolabah woodland on alluvial plains	Of concern	772.24	1.71
11.4.8	Eucalyptus cambageana woodland to open forest with Acacia harpophylla or A. argyrodendron on Cainozoic clay plains	Endangered	150.02	0.33
11.4.9	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Endangered	236.86	0.53
11.4.9a	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Endangered	20.31	0.05
11.5.10	Melaleuca tamariscina tall open shrubland to low woodland on Cainozoic sand plains and/or remnant surfaces	Of concern	31.4	0.07
11.5.15	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Endangered	109.14	0.24
11.5.16	Acacia harpophylla and/or Casuarina cristata open forest in depressions on Cainozoic sand plains and remnant surfaces	Endangered	327.87	0.73
11.5.18	Micromyrtus capricornia open shrubland on Cainozoic sand plains and/or remnant surfaces	Of concern	5.01	0.01
11.5.2	Eucalyptus crebra, Corymbia spp., with E. moluccana woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	No concern at present	481.38	1.07
11.5.3	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	No concern at present	3,192.83	7.08
11.5.9b	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	No concern at present	839.5	1.86
11.7.2	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	No concern at present	210.81	0.47

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
11.8.11	Dichanthium sericeum grassland on Cainozoic igneous rocks	Of concern	597.55	1.33
11.8.4	Eucalyptus melanophloia woodland to open woodland on Cainozoic igneous rocks.	No concern at present	32.44	0.07
11.8.5	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	No concern at present	181.95	0.4
11.9.1	Acacia harpophylla-Eucalyptus cambageana woodland to open forest on fine-grained sedimentary rocks	Endangered	46.42	0.1
11.9.5	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Endangered	3.0	0.01
11.9.7	Eucalyptus populnea, Eremophila mitchellii shrubby woodland on fine-grained sedimentary rocks	Of concern	133.56	0.3
non-remnant	None	None	36,420.98	80.79

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

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

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

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.3.1	Pre-clearing 784000 ha; Remnant 2019 81000 ha	25a	Not a Wetland	Low
11.3.11	Pre-clearing 18000 ha; Remnant 2019 2000 ha	7a	Not a Wetland	Low
11.3.2	Pre-clearing 1914000 ha; Remnant 2019 503000 ha	17a	Contains Palustrine	Low
11.3.25	Pre-clearing 804000 ha; Remnant 2019 519000 ha	16a	Riverine	Low
11.3.3	Pre-clearing 932000 ha; Remnant 2019 273000 ha	16c	Not a Wetland	Low
11.4.8	Pre-clearing 726000 ha; Remnant 2019 67000 ha	25a	Contains Palustrine	Low
11.4.9	Pre-clearing 998000 ha; Remnant 2019 90000 ha	25a	Contains Palustrine	Low
11.4.9a	Pre-clearing 998000 ha; Remnant 2019 90000 ha	25a	Not a Wetland	Low
11.5.10	Pre-clearing 11000 ha; Remnant 2019 10000 ha	21b	Not a Wetland	Low
11.5.15	Pre-clearing 44000 ha; Remnant 2019 15000 ha	7a	Not a Wetland	Low
11.5.16	Pre-clearing 15000 ha; Remnant 2019 4000 ha	25a	Palustrine	Low

Regional Ecosystem	Remnant Extent	BVG (1 Million)	Wetland	Representation in protected estate
11.5.18	Pre-clearing 7000 ha; Remnant 2019 4000 ha	29b	Not a Wetland	Medium
11.5.2	Pre-clearing 361000 ha; Remnant 2019 190000 ha	18b	Not a Wetland	Low
11.5.3	Pre-clearing 976000 ha; Remnant 2019 369000 ha	17a	Not a Wetland	Low
11.5.9b	Pre-clearing 366000 ha; Remnant 2019 239000 ha	18b	Not a Wetland	Low
11.7.2	Pre-clearing 549000 ha; Remnant 2019 359000 ha	24a	Not a Wetland	Low
11.8.11	Pre-clearing 602000 ha; Remnant 2019 170000 ha	30b	Not a Wetland	Low
11.8.4	Pre-clearing 217000 ha; Remnant 2019 151000 ha	11a	Not a Wetland	High
11.8.5	Pre-clearing 632000 ha; Remnant 2019 346000 ha	11a	Not a Wetland	Low
11.9.1	Pre-clearing 564000 ha; Remnant 2019 53000 ha	25a	Not a Wetland	Low
11.9.5	Pre-clearing 2270000 ha; Remnant 2019 162000 ha	25a	Not a Wetland	Low
11.9.7	Pre-clearing 505000 ha; Remnant 2019 103000 ha	17a	Not a Wetland	Low
non-remnant	None	None	None	None

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

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

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

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

Regional Ecosystem	Special Values
11.3.1	Habitat for threatened fauna species including painted honeyeater, <i>Grantiella picta</i> particularly in subregion 35 (Oliver et al. 2003).
11.3.11	Potential habitat for NCA listed species: <i>Macropteranthes leiocaulis</i>
11.3.2	Habitat for threatened flora species <i>Homopholis belsonii</i> . This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
11.3.25	Shown to be associated with a high fauna species richness in the Taroom area (Venz et al. 2002). Within parts of the Fitzroy catchment, this RE is known habitat for the threatened freshwater turtle <i>Rheodytes leukops</i> . Known to be important habitat for other riparian freshwater turtle species. This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
11.3.3	Mature trees provide hollows for fauna especially nesting birds. Associated with a high number fauna species (Dick 1992, Venz et al. 2002). 11.3.3c: Mature trees provide hollows for fauna especially nesting birds. Associated with a high number of fauna species (Dick 1992, Venz et al. 2002).

Regional Ecosystem	Special Values
11.4.8	Larger gilgai provides ephemeral wetland habitat.
11.4.9	Potential habitat for NCA listed species: <i>Cadellia pentastylis</i> , <i>Solanum adenophorum</i> , <i>Solanum dissectum</i> , <i>Solanum elachophyllum</i> , <i>Solanum johnsonianum</i> , <i>Xerothamnella herbacea</i>
11.4.9a	Potential habitat for NCA listed species: <i>Cadellia pentastylis</i> , <i>Solanum adenophorum</i> , <i>Solanum dissectum</i> , <i>Solanum elachophyllum</i> , <i>Solanum johnsonianum</i> , <i>Xerothamnella herbacea</i>
11.5.10	None
11.5.15	Habitat for threatened plant species including <i>Fontainea fugax</i> , <i>Pomaderris clivicola</i> and <i>Cadellia pentastylis</i> and the near threatened species <i>Macropteranthes leiocaulis</i> ; a wide range of flora and fauna species with disjunct distributions.
11.5.16	Potential habitat for NCA listed species: <i>Solanum elachophyllum</i>
11.5.18	None
11.5.2	Potential habitat for NCA listed species: <i>Acacia storyi</i>
11.5.3	Potential habitat for NCA listed species: <i>Sannantha brachypoda</i>
11.5.9b	Potential habitat for NCA listed species: <i>Cerbera dumicola</i> , <i>Cossinia australiana</i> , <i>Cycas ophiolitica</i> , <i>Solanum elachophyllum</i>
11.7.2	Habitat for threatened plant species including <i>Acacia wardellii</i> .
11.8.11	Habitat for threatened plant species including <i>Trioncinia retroflexa</i> and <i>Dichanthium queenslandicum</i> . <i>T. retroflexa</i> is currently known from three small populations.
11.8.4	Potential habitat for NCA listed species: <i>Acacia arbiana</i> , <i>Acacia islana</i> , <i>Bertya pedicellata</i> , <i>Grevillea hockingsii</i> , <i>Haloragis exalata</i> subsp. <i>velutina</i> , <i>Marsdenia brevifolia</i> , <i>Sannantha brachypoda</i> . This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
11.8.5	In southern part of bioregion, habitat for a number of threatened plant species including <i>Picris evae</i> and <i>Thesium australe</i> and near threatened species <i>Digitaria porrecta</i> and <i>Discaria pubescens</i> . This ecosystem is also known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 11.8.5a: This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
11.9.1	Potential habitat for NCA listed species: <i>Solanum adenophorum</i> , <i>Solanum dissectum</i> , <i>Solanum elachophyllum</i> , <i>Solanum johnsonianum</i> , <i>Xerothamnella herbacea</i>
11.9.5	Habitat for threatened fauna species including <i>Jalmenus eubulus</i> , pale imperial hairstreak butterfly (Eastwood et al. 2008)
11.9.7	None
non-remnant	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

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

A comprehensive description of BVGs is available at:

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

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

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

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	36,420.98	80.79
11a	Moist to dry open forests to woodlands dominated by <i>Eucalyptus orgadophila</i> (mountain coolibah). Some areas dominated by <i>E. tereticornis</i> (blue gum), <i>E. melliodora</i> (yellow box), <i>E. albens</i> (white box), <i>E. crebra</i> (narrow-leaved red ironbark) or <i>E. melanophloia</i> (silver-leaved ironbark). (land zones 8, 11, 4, [3]) (BRB, SEQ, EIU)	214.38	0.48
16a	Open forest and woodlands dominated by <i>Eucalyptus camaldulensis</i> (river red gum) (or <i>E. tereticornis</i> (blue gum)) and/or <i>E. coolabah</i> (coolabah) (or <i>E. microtheca</i> (coolabah)) fringing drainage lines. Associated species may include <i>Melaleuca</i> spp., <i>Corymbia tessellaris</i> (carbeen), <i>Angophora</i> spp., <i>Casuarina cunninghamiana</i> (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, EIU, NWH, SEQ, [NET, WET]) (All bioregions except CYP and CQC)	546.96	1.21
16c	Woodlands and open woodlands dominated by <i>Eucalyptus coolabah</i> (coolabah) or <i>E. microtheca</i> (coolabah) or <i>E. largiflorens</i> (black box) or <i>E. tereticornis</i> (blue gum) or <i>E. chlorophylla</i> on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	772.24	1.71
17a	Woodlands dominated by <i>Eucalyptus populnea</i> (poplar box) (or <i>E. brownii</i> (Reid River box)) on alluvium, sand plains and footslopes of hills and ranges. (land zones 3, 5, 10, 9, 4, 11, 12, [8]) (BRB, MUL, DEU, MUL, EIU)	3,430.33	7.61
18b	Woodlands dominated <i>Eucalyptus crebra</i> (sens. lat.) (narrow-leaved red ironbark) frequently with <i>Corymbia</i> spp. or <i>Callitris</i> spp. on flat to undulating plains. (land zones 5, 3) (BRB, DEU, EIU, GUP, CYP)	1,320.88	2.93
21b	Low open woodlands and tall shrublands of <i>Melaleuca citrolens</i> or <i>M. stenostachya</i> or other <i>Melaleuca</i> spp. (land zones 5, 3, 7, 10, 11, 12) (GUP, CYP, EIU, DEU, BRB, [SEQ])	31.4	0.07
24a	Low woodlands to tall shrublands dominated by <i>Acacia</i> spp. on residuals. Species include <i>A. shirleyi</i> (lancewood), <i>A. catenulata</i> (bendee), <i>A. microsperma</i> (bowyakka), <i>A. clivicola</i> , <i>A. sibirica</i> , <i>A. rhodoxylon</i> (rosewood) and <i>A. leptostachya</i> (Townsville wattle). (land zones 7, 10, 5, 12, 11, [9, 3]) (MUL, CHC, BRB, GUP, EIU, MGD, DEU, NWH, [CYP])	210.81	0.47
25a	Open forests to woodlands dominated by <i>Acacia harpophylla</i> (brigalow) sometimes with <i>Casuarina cristata</i> (belah) on heavy clay soils. Includes areas co-dominated with <i>A. cambagei</i> (gidgee) and/or emergent eucalypts (land zones 4, 9, 3, 11, 7, 12, [5, 8]) (BRB, MUL, MGD, DEU, [SEQ])	1,418.45	3.15
29b	Open shrublands to open heaths in montane frequently rocky locations. (land zones 7, 12, 11, 5, 8, 10) (BRB, NWH, WET, CYP, EIU, SEQ, DEU, [NET, CQC])	5.01	0.01

BVG (1 Million)	Description	Area (Ha)	% of AOI
30b	Tussock grasslands dominated by <i>Astrebla</i> spp. (mitchell grass) or <i>Dichanthium</i> spp. (bluegrass) often with <i>Iseilema</i> spp. on undulating downs or clay plains. (land zones 9, 3, 4, 8, [5]) (MGD, CHC, GUP, BRB, [EIU, DEU, NWH])	597.55	1.33
7a	Semi-evergreen vine thickets on wide range of substrates. (land zones 8, 9, 11, 12, 5, 4, 3, 10, [7]) (BRB, EIU, SEQ, CQC, [WET, GUP]) (Tracey 1982 11)	113.88	0.25

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

4. Technical and BioCondition Benchmark Descriptions

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

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

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

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

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

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

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

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

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

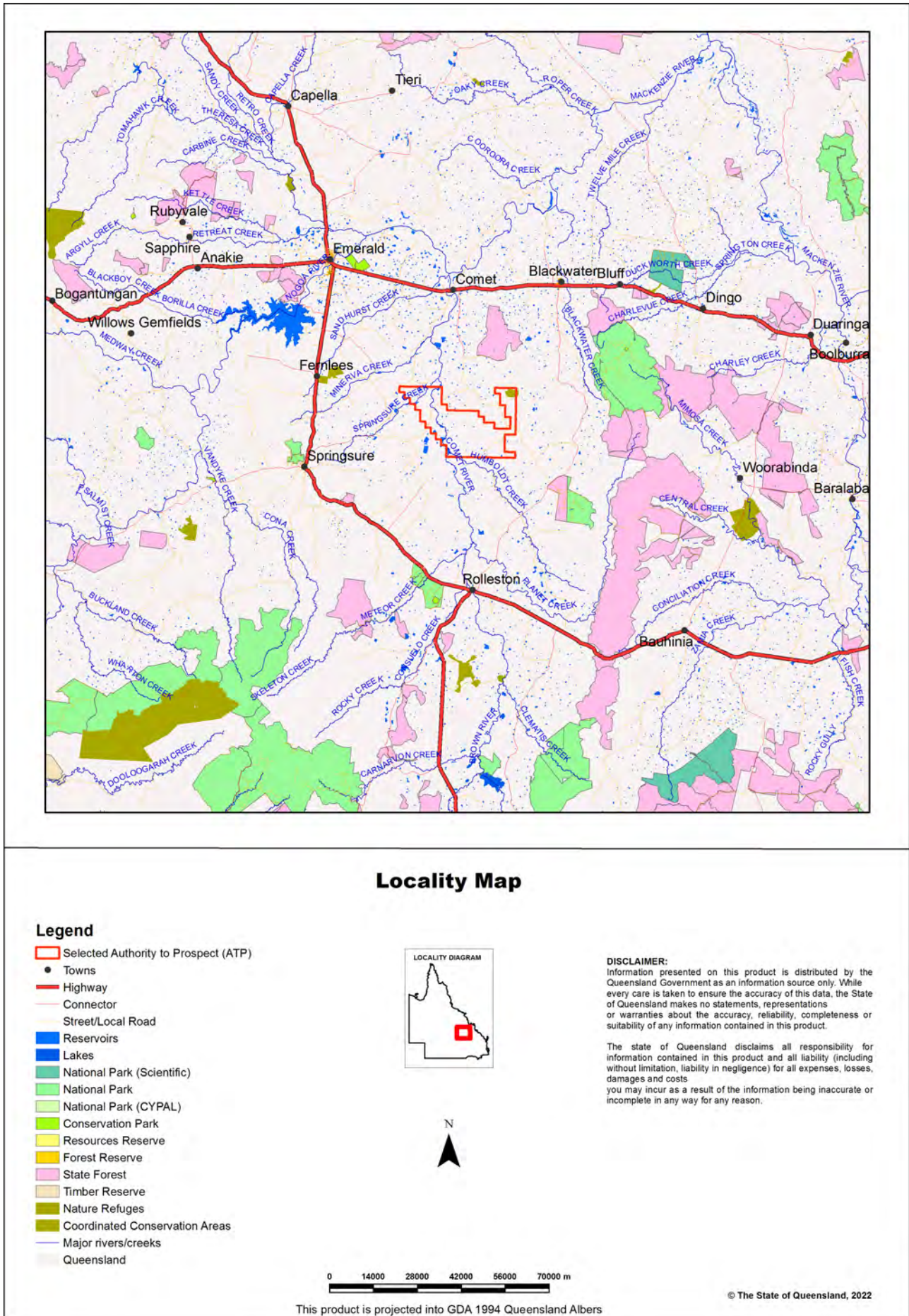
Table 7: List of remnant regional ecosystems within the AOI for which technical and biocondition benchmark descriptions are available

Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.3.1	Available	Available
11.3.11	Available	Available
11.3.2	Available	Available
11.3.25	Available	Available
11.3.3	Available	Available
11.4.8	Available	Available
11.4.9	Available	Not currently available
11.4.9a	Available	Not currently available

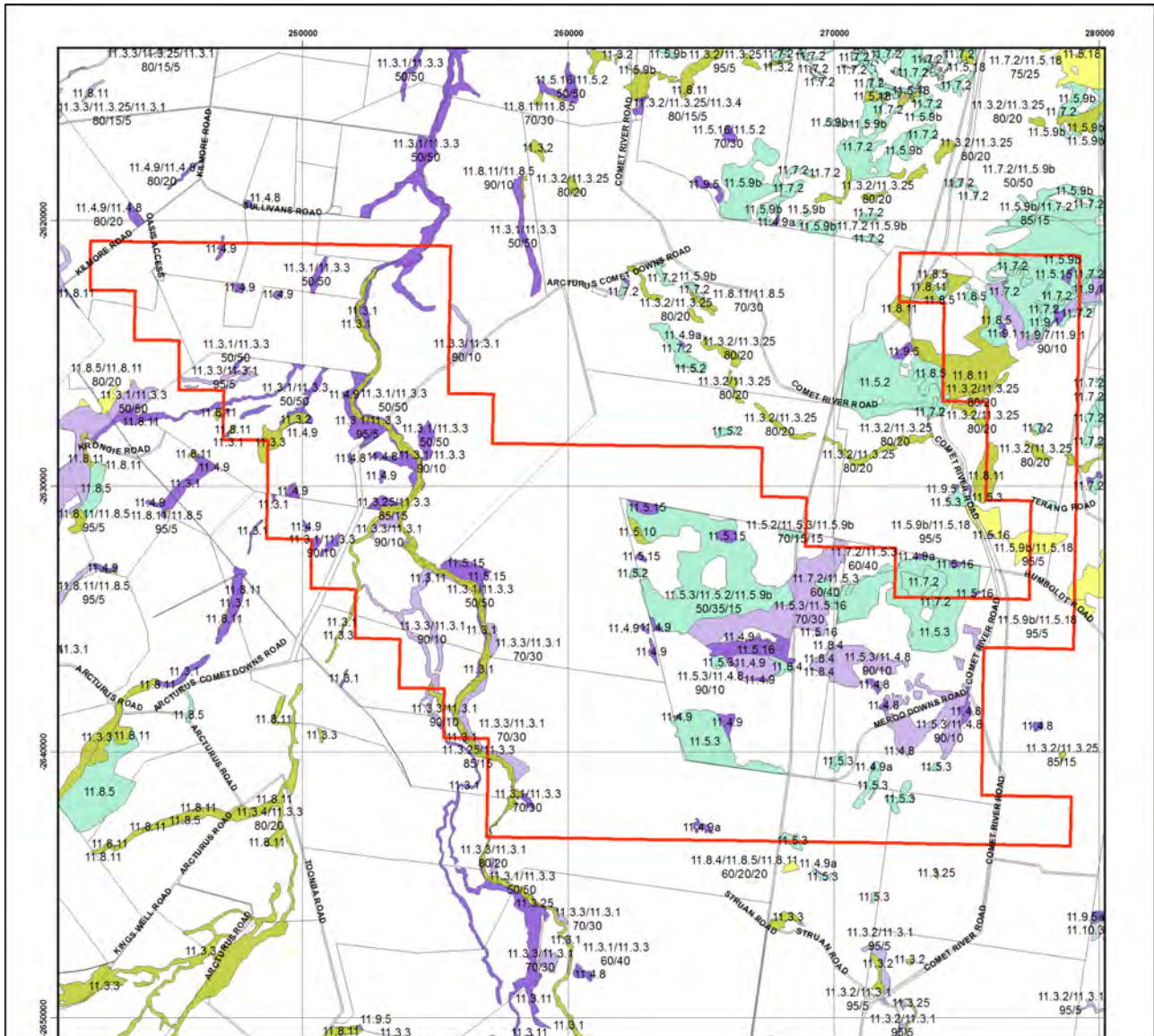
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
11.5.10	Available	Available
11.5.15	Available	Available
11.5.16	Available	Available
11.5.18	Available	Not currently available
11.5.2	Available	Available
11.5.3	Available	Available
11.5.9b	Available	Available
11.7.2	Available	Available
11.8.11	Available	Available
11.8.4	Available	Available
11.8.5	Available	Not currently available
11.9.1	Available	Available
11.9.5	Available	Available
11.9.7	Available	Available
non-remnant	Not currently available	Not currently available

Maps

Map 1 - Location



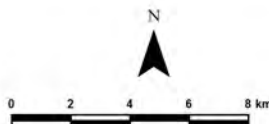
Map 2 - Remnant 2019 regional ecosystems



Remnant 2019 Regional Ecosystems

Biodiversity Status

- Selected Authority to Prospect (ATP)
- 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



This product is projected into GDA 1994 Queensland Albers

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.

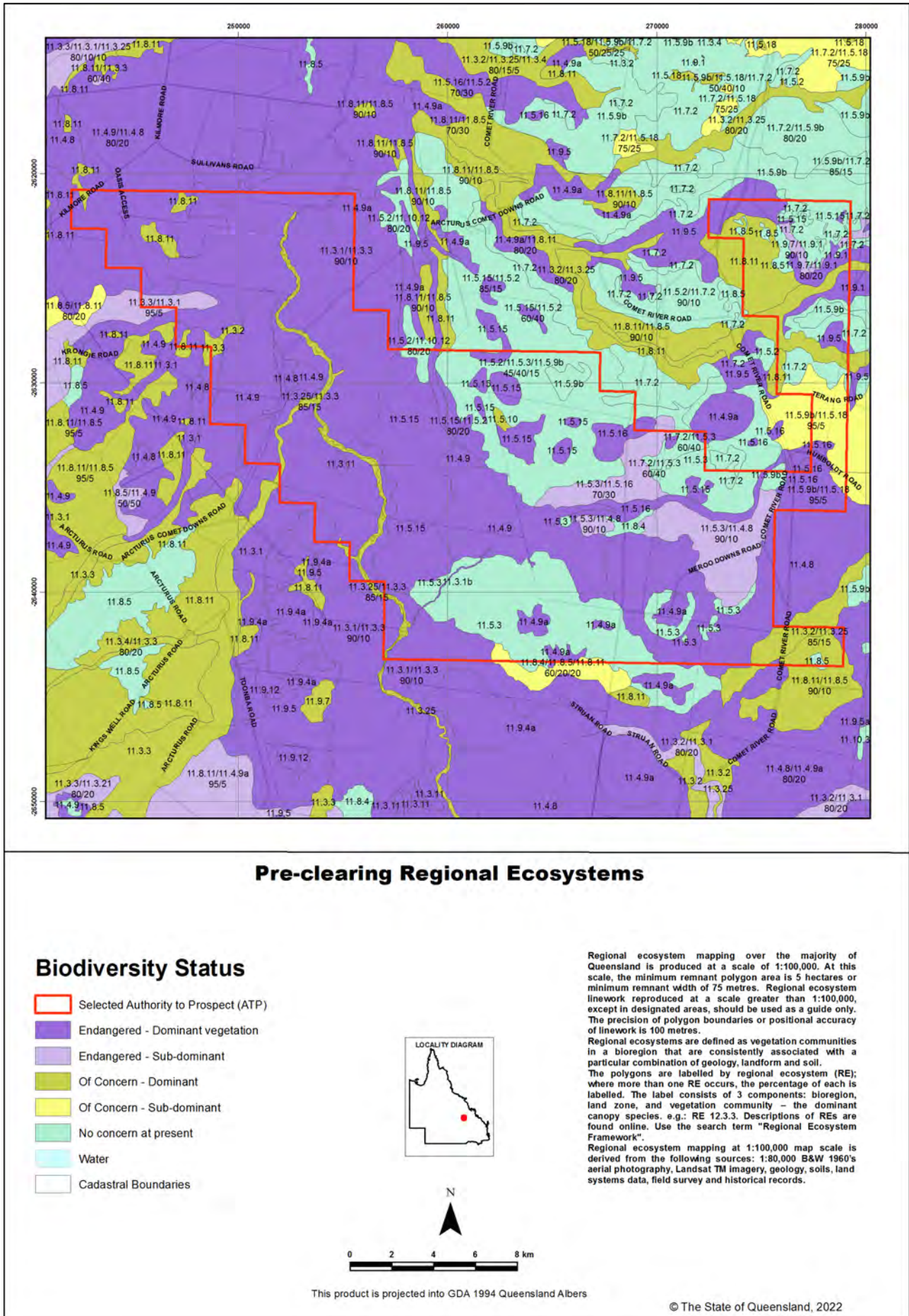
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists 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.

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Map 3 - Pre-clearing regional ecosystems



Pre-clearing Regional Ecosystems

Biodiversity Status

- Selected Authority to Prospect (ATP)
- 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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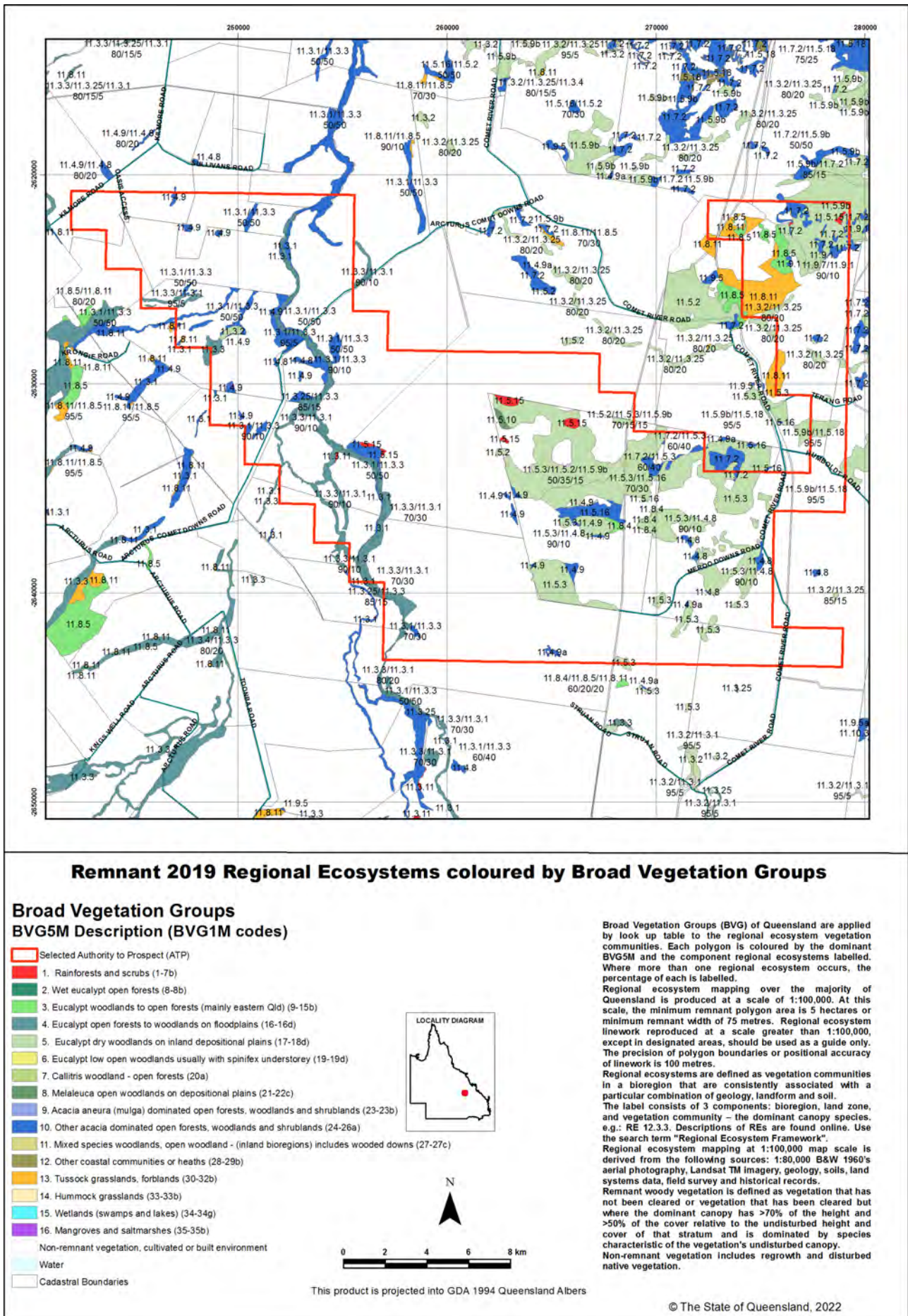
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should 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.

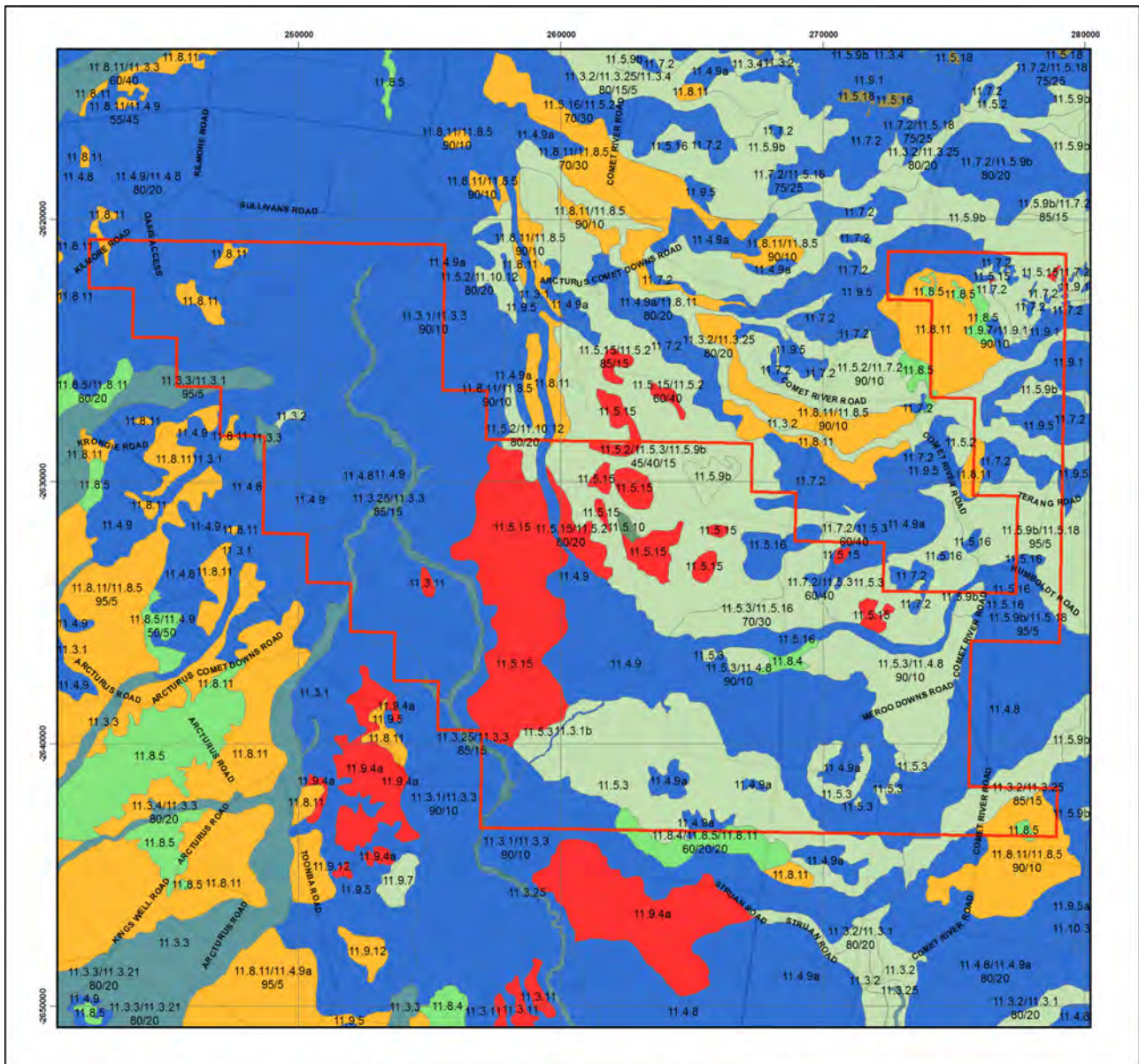
The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species, e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search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

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



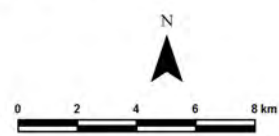
Map 5 - Pre-clearing regional ecosystems by BVG (5M)



Pre-clearing Regional Ecosystems coloured by Broad Vegetation Groups

Broad Vegetation Groups BVG5M Description (BVG1M codes)

- Selected Authority to Prospect (ATP)
- 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



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 BVGSM and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.

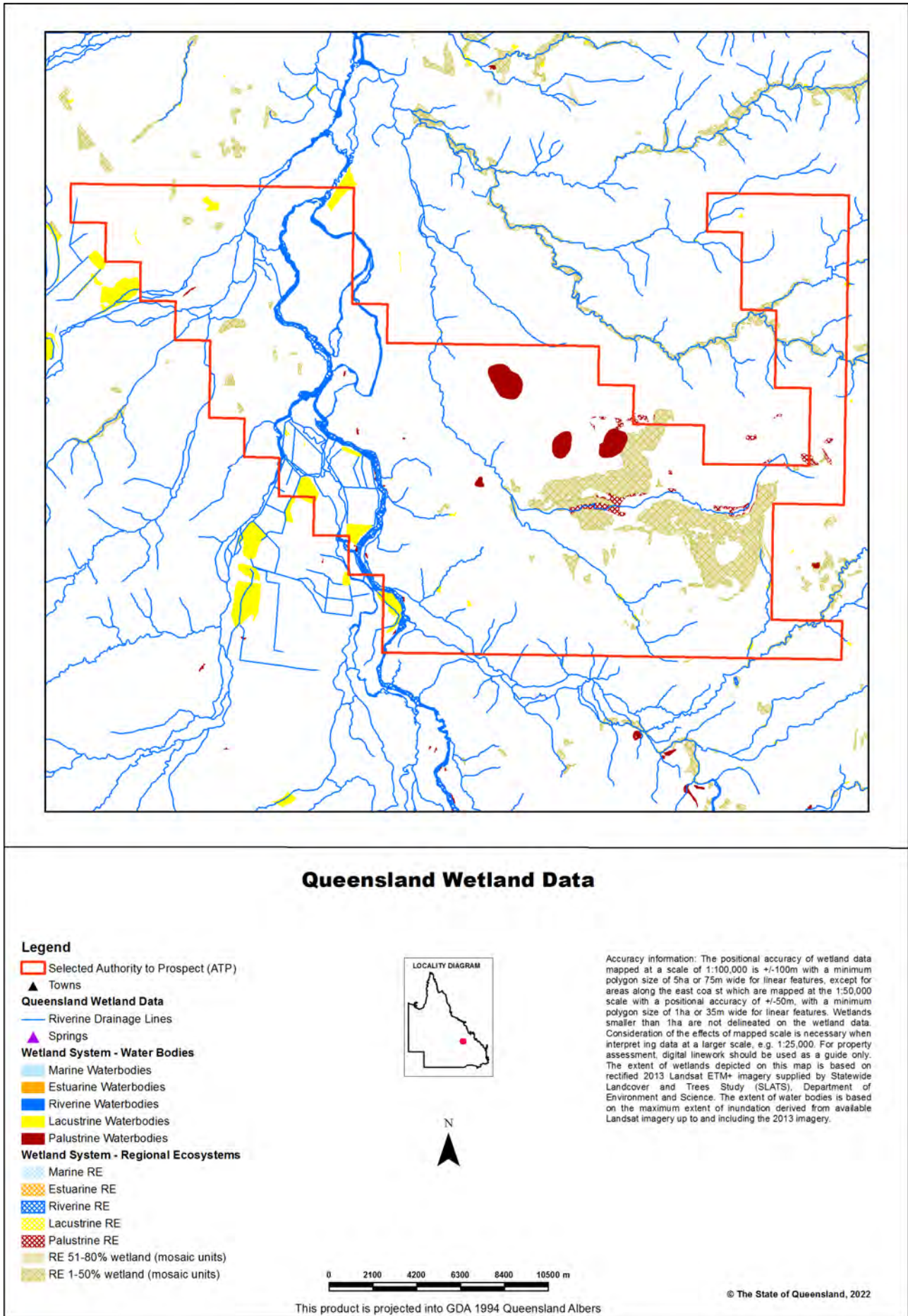
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should 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 BSW 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.

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Map 6 - Wetlands and waterways



Links and Other Information Sources

The Department of Environment and Science's Website -

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

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

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

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

The methodology for mapping regional ecosystems can be downloaded from:

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

Technical descriptions for regional ecosystems can be obtained from:

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

Benchmarks can be obtained from:

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

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

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

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

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

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

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

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

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

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

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

Appendix 2 - Acronyms and Abbreviations

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



Project name: Mahalo North Coal Seam Gas Project

APPENDIX B FLORA SPECIES LIST AND SITE DATA



Species name	Common name	Non-native	Biosecurity	WoNS
<i>Acacia argyrodendron</i>	Black Gidyea	-	-	-
<i>Acacia cambagei</i>	Gidgee	-	-	-
<i>Acacia crassa</i> subsp. <i>crassa</i>	Curracabah Wattle	-	-	-
<i>Acacia debilis</i>	-	-	-	-
<i>Acacia excelsa</i>	Ironwood	-	-	-
<i>Acacia harpophylla</i>	Brigalow	-	-	-
<i>Acacia leiocalyx</i>	Black Wattle	-	-	-
<i>Achyranthes aspera</i>	Chaff Flower	-	-	-
<i>Alectryon diversifolius</i>	Scrub Boonaree	-	-	-
<i>Alectryon oleifolius</i> subsp. <i>canescens</i>	-	-	-	-
<i>Alectryon oleifolius</i> subsp. <i>elongatus</i>	Boonaree	-	-	-
<i>Alphitonia excelsa</i>	Red Ash	-	-	-
<i>Alstonia constricta</i>	Bitterbark	-	-	-
<i>Alternanthera denticulata</i> var. <i>micrantha</i>	-	-	-	-
<i>Alternanthera nana</i>	Hairy Joyweed	-	-	-
<i>Angophora leiocarpa</i>	Rusty Gum	-	-	-
<i>Aristida calycina</i>	Dark Wiregrass	-	-	-
<i>Aristida caput-medusae</i>	Many Headed Wiregrass	-	-	-
<i>Aristida holathera</i>	Erect Kerosene Grass	-	-	-
<i>Aristida ramosa</i>	Purple Wiregrass	-	-	-
<i>Atriplex eardleyae</i>	-	-	-	-
<i>Atriplex elachophylla</i>	-	-	-	-
<i>Atriplex elachophylla</i>	-	-	-	-
<i>Bertya oleifolia</i>	-	-	-	-
<i>Bothriochloa bladhii</i>	Forest Bluegras	-	-	-
<i>Brachychiton populneus</i>	Kurrajong	-	-	-
<i>Brachychiton rupestris</i>	Queensland Bottle Tree	-	-	-
<i>Callitris glaucophylla</i>	White Cypress Pine	-	-	-
<i>Canthium oleifolium</i>	Myrtle Tree	-	-	-
<i>Capparis canescens</i>	Wild Orange	-	-	-
<i>Capparis lasiantha</i>	Nippan	-	-	-
<i>Carissa ovata</i>	Currant Bush	-	-	-
<i>Cassia brewsteri</i>	Leichhardt Bean	-	-	-
<i>Casuarina cristata</i>	Belah	-	-	-
<i>Casuarina cunninghamiana</i>	River Oak	-	-	-
<i>Cenchrus ciliaris</i>	Buffel Grass	*	-	-
<i>Chamaesyce dallachiana</i>	Mat Spurge	-	-	-
<i>Cheilanthes sieberi</i>	Mulga Fern	-	-	-
<i>Chloris gayana</i>	Rhodes Grass	*	-	-
<i>Chrysopogon fallax</i>	Golden Beard Grass	-	-	-
<i>Citrus glauca</i>	Desert Lime	-	-	-
<i>Clematicissus opaca</i>	Slender Grape	-	-	-
<i>Corymbia clarksoniana</i>	Long-fruited Bloodwood	-	-	-
<i>Corymbia erythrophloia</i>	Variable-barked Bloodwood	-	-	-
<i>Cymbidium caniculatum</i>	Black Orchid	-	-	-
<i>Cyperus haspan</i>	Sharp Edge Sedge	-	-	-
<i>Dinebra ligulata</i>	-	-	-	-
<i>Ehretia membranifolia</i>	Weeping Koda	-	-	-
<i>Elytrophorus spicatus</i>	Spikegrass	-	-	-
<i>Enchylaena tomentosa</i>	Ruby Saltbush	-	-	-
<i>Enneapogon avenaceus</i>	Common Bottleshedders	-	-	-
<i>Enneapogon gracilis</i>	Slender Nineawn	-	-	-
<i>Enneapogon polyphyllus</i>	Leafy Nineawn	-	-	-
<i>Enteropogon acicularis</i>	Curly Windmill Grass	-	-	-
<i>Eragrostis curvula</i>	African Lovegrass	*	-	-
<i>Eremophila deserti</i>	Ellangowan Poison Bush	-	-	-
<i>Eremophila mitchellii</i>	False Sandalwood	-	-	-
<i>Erythroxylum australe</i>	Cocaine Bush	-	-	-
<i>Eucalyptus cambageana</i>	Dawson Gum	-	-	-
<i>Eucalyptus coolabah</i>	Coolabah	-	-	-
<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark	-	-	-
<i>Eucalyptus populnea</i>	Poplar Box	-	-	-
<i>Eucalyptus woollsiana</i>	Narrow Leaved Grey Box	-	-	-
<i>Grevillea striata</i>	Beefwood	-	-	-
<i>Grewia latifolia</i>	Dogsballs	-	-	-
<i>Harrisia martinii</i>	Harrisia Cactus	*	3	-
<i>Heteropogon contortus</i>	Black Speargrass	-	-	-
<i>Hibiscus splendens</i>	Pink Hibiscus	-	-	-

Species name	Common name	Non-native	Biosecurity	WoNS
<i>Hibiscus sturtii</i>	Hill Hibiscus	-	-	-
<i>Lysiphyllum carronii</i>	Ebony Tree	-	-	-
<i>Lysiphyllum cunninghamii</i>	Jigal Tree	-	-	-
<i>Macroptilium atropurpureum</i>	Siratro	*	-	-
<i>Megathyrsus maximus</i>	Guinea Grass	*	-	-
<i>Melaleuca decora</i>	Paperbark	-	-	-
<i>Melenis repens</i>	Red Natal Grass	*	-	-
<i>Micromyrtus sessilis</i>	-	-	-	-
<i>Ocimum tenuiflorum</i>	Sacred Basil	-	-	-
<i>Opuntia stricta</i>	Common Prickly Pear	*	3	Yes
<i>Owenia acidula</i>	Emu Apple	-	-	-
<i>Panicum decompositum</i>	Native Millet	-	-	-
<i>Panicum effusum</i>	Hairy Panic	-	-	-
<i>Parsonsia eucalyptophylla</i>	Gargaloo	-	-	-
<i>Parthenium hysterophorus</i>	Parthenium Weed	*	3	Yes
<i>Paspalidium distans</i>	Shotgrass	-	-	-
<i>Perotis rara</i>	Comet Grass	-	-	-
<i>Petalostigma pubescens</i>	Quinine Bush	-	-	-
<i>Petalostylis labicheoides</i>	Butterfly Bush	-	-	-
<i>Pimelea simplex</i>	Desert Riceflower	-	-	-
<i>Pittosporum spinescens</i>	Wallaby Apple	-	-	-
<i>Portulacca oleracea</i>	Pigweed	-	-	-
<i>Salsola australis</i>	-	-	-	-
<i>Santalum lanceolatum</i>	Sandalwood	-	-	-
<i>Sclerolaena bicornis</i>	Goathead Burr	-	-	-
<i>Sesbania sp</i>	-	-	-	-
<i>Setaria incrassata</i>	Purple Pigeon Grass	*	-	-
<i>Setaria surgens</i>	Annual Pigeon Grass	-	-	-
<i>Sida cordifolia</i>	Flannel Weed	*	-	-
<i>Sida fibulifera</i>	Pin Sida	-	-	-
<i>Sida rhombifolia</i>	Common Sida	-	-	-
<i>Sida trichopoda</i>	High Sida	-	-	-
<i>Sporobolus creber</i>	Rats Tail Grass	-	-	-
<i>Stylosanthes scabra</i>	Shrubby Stylo	*	-	-
<i>Terminalia oblongata subsp. oblongata</i>	Yellow Wood	-	-	-
<i>Themeda triandra</i>	Kangaroo Grass	-	-	-
<i>Trianthema portulacasyrum</i>	Black Pigweed	*	-	-
<i>Urochloa mosanbicensis</i>	Sabi Grass	*	-	-
<i>Ventilago viminalis</i>	Supplejack	-	-	-
<i>Zygophyllum glaucum</i>	Pale Twinleaf	-	-	-

Site ID	RE herbarium	GT RE	GT landzone	Landform	Status	Height	% cover
RE1	11.4.8	11.4.8	4	Flat plain	Remnant	10-30	10-30
RE2	11.4.8	11.4.8	4	Flat plain	Remnant	10-30	10-30
RE3		Na	4	Flat plain	Non-remnant	5-10	<10
RE4		11.5.3	5	Sandy plain	Remnant	10-30	10-30
RE5		Na	5	Gently undulating plain	Non-remnant	30-70	30-70
RE6			5	Gently undulating plain	Non-remnant	10-30	10-30
RE7		Na	4	Flat clay plain	Non-remnant	10-30	10-30
RE8		Na	4	Flat plain	Non-remnant	30-70	30-70
RE9		11.5.3	5	Flat plain	Non-remnant	10-30	<10
RE10	11.4.9	11.5.3	4	Flat plain	Remnant	10-30	10-30
RE11	11.4.9	11.4.9	4	Flat plain	Remnant	10-30	30-70
RE12	11.5.3	11.5.3	5	Flat plain	Non-remnant	10-30	<10
RE13	Non-rem	11.5.3	5	Flat plain	HVR	10-30	10-30
RE14	Non rem	Non rem		Gently undulating plain	Non-remnant	<10	<10
RE15		Na	3	Floodplain	Non-remnant	70-100	70-100
RE16		Non-rem	4	Undulating clay plain	Non-remnant	<10	<10
RE18	Non-rem	11.8.4	8	Rocky ridge	HVR	10-30	10-30
RE19	11.4.9	11.4.9	4	Undulating plain	Remnant	10-30	10-30
RE20	11.4.8	11.4.8	4	Gently undulating plain	HVR	5-10	10-30
RE21	11.4.8	11.4.8	4	Gently undulating plain	Non-remnant	5-10	<10

Site ID	Structural form	TEC	TEC_name	EDL	EDL median height	EDL height range	E med height
RE1	Woodland	no	Brigalow	T1	17	10-30	
RE2	Open-woodland	no	Brigalow	T1	13	10-30	
RE3	Low open-woodland	no		T1	5	5-10	
RE4	Woodland	no		T1	10	10-30	
RE5	Grassland	no		G	0.5	30-70	
RE6	Low open-shrubland	no		S1	1.5	10-30	
RE7	Grassland	no		G	0.6	10-30	
RE8	Grassland	no		G	0.5	30-70	
RE9	Open-woodland	no		T1	9	10-30	
RE10	Open-woodland	no		T1	15	10-30	
RE11	Woodland	no	Brigalow	T1	10	10-30	
RE12	Open-woodland	no		T1	15	10-30	
RE13	Open-woodland	no		T1	13	10-30	
RE14	Tall open-shrubland	no		S1	6	<10	
RE15	Grassland	no		G	1.5	70-100	
RE16	Low open-shrubland	no		S1	1.8	<10	2.5
RE18	Open-woodland			T1	9	10-30	
RE19	Woodland	yes	Brigalow	T1	11	10-30	
RE20	Low woodland	yes	Brigalow	T1	5	5-10	
RE21	Low open-woodland	no	Brigalow	T1	3.5	5-10	

Site ID	E_species1	T1 med height	T1_species1	T1_species2	T1_species3	T2 med height
RE1		17	Eucalyptus cambageana	Casuarina cunninghamiana	Acacia harpophylla	11
RE2		13	Eucalyptus cambageana	Acacia harpophylla		8
RE3		5	Alphitonia excelsa	Grevillea striata	Petalostigma pubescens	
RE4		10	Acacia cambagei	Eucalyptus melanophloia		6
RE5						
RE6						
RE7						
RE8		5	Acacia harpophylla			
RE9		9	Eucalyptus populnea	Eucalyptus melanophloia		5
RE10		15	Eucalyptus populnea	Brachychiton rupestris		8
RE11		10	Acacia harpophylla			6
RE12		15	Corymbia clarksoniana	Eucalyptus melanophloia		5
RE13		13	Acacia cambagei	Eucalyptus melanophloia		8
RE14						
RE15						
RE16	Eucalyptus cambageana					
RE18		9	Corymbia erythrophloia	Eucalyptus melanophloia	Angophora leiocarpa	5
RE19		12	Acacia harpophylla	Brachychiton rupestris		5
RE20		5	Acacia harpophylla	Terminalia oblongata subsp. oblongata	Lysiphyllum caronii	
RE21		3.5	Acacia harpophylla			

Site ID	T2_species1	T2_species2	T2_species3	T2_species4	T2_species5	S1 med height
RE1	Acacia harpophylla	Casuarina cristata	Eremophilla mitchellii			2.5
RE2	Acacia harpophylla					2.5
RE3						1.5
RE4	Acacia cambagei	Alphitonia excelsa				1.5
RE5						1.8
RE6						1.5
RE7						0,8
RE8						1.5
RE9	Eremophila mitchellii	Petalostigma pubescens				2.5
RE10	Brachychiton rupestris	Eucalyptus populnea	Canthium oleifolium	Eremophils mitchellii		3
RE11	Acacia harpophylla	Owenia acidula	Geijera parviflora	Terminalia oblongata		4.5
RE12	Petalostigma pubescens	Alphitonia excelsa				1
RE13	Acacia cambagei	Cassia brewsteri	Alphitonia excelsa	Geijera parviflora	Ventilago viminalis	3.5
RE14						6
RE15						
RE16						1.8
RE18	Angophora leiocarpa	Petalostigma pubescens				2.5
RE19	Geijera parviflora	Eremophila mitchellii	Terminalia oblongata			1.5
RE20						2.5
RE21						1.5

Site ID	S1_species1	S1_species2	S1_species3	S1_species4	S1_species5	S2 med height
RE1	Eremophila mitchellii	Acacia harpophylla	Geijera parviflora			0.7
RE2	Eremophila mitchellii	Acacia harpophylla	Geijera parviflora			0.7
RE3	Acacia leiocalyx	Grevillea striata				
RE4	Acacia leiocalyx	Alphitonia excelsa	Acacia cambagei	Eremophila mitchellii	Erythroxyllum australe	
RE5	Erythroxyllum australe	Bertya oleifolia	Micromyrtus sessilis		Acacia leiocalyx	Cassia brewsteri
RE6	Alphitonia excelsa	Cassia brewsteri	Erythroxyllum australe	Hibiscus splendens	Capparis lasiantha	Ehretia membranifolia
RE7	Sclerolaena bicornis					
RE8	Eremophila mitchellii					
RE9	Erythroxyllum australe	Geijera parviflora	Canthium oleifolium			
RE10	Erythroxyllum australe	Geijera parviflora	Eremophila mitchellii			0.5
RE11	Geijera parviflora	Owenia acidula	Terminalia oblongata	Alectryon oleifolius	Erythroxyllum australe	0.7
RE12	Acacia crassa subsp. crassa	Petalostigma pubescens				
RE13	Erythroxyllum australe	Cassia brewsteri	Brachychiton populneus	Erhertia membranaceum	Canthium oleifolium	1
RE14	Acacia harpophylla	Alectryon oleifolius subsp. elongatus	Terminalia oblongata	Lysiphyllum caronii	Citrus glauca	0.5
RE15						
RE16	Acacia leiocalyx					
RE18	Petalostigma pubescens	Cassia brewsteri	Canthium oleifolium			1.2
RE19	Alectryon oleifolius subsp. canescens	Grewia latifolia	Carrissia ovata	Sample herb		
RE20	Citrus glauca	Geijera parviflora				1.2
RE21	Acacia harpophylla	Citrus glauca				

Site ID	S2_species1	S2_species2	S2_species3	S2_species4	S2_species5	G med height	G_species1
RE1	Carissa ovata	Sclerolaena bicornis				0.3	Setaria surgens
RE2	Carissa ovata	Salsola australis				0.25	Panicum effusum
RE3						1.5	Aristida calycina
RE4						0.7	Setaria surgens
RE5						0.5	Sida fibulifera
RE6						0.5	Aristida calycina
RE7						0.6	Paspalidium distans
RE8						0.5	Digitaria divaricatissima
RE9						0.6	Heteropogon contortus
RE10	Carissa ovata					0.5	Panicum effusum
RE11	Carissa ovata	Alectryon diversifolius	Clematicissus opaca	Acacia debilis	Pittosporum spinescens	0.5	Panicum decompositum
RE12						1.2	Chrysopogon fallax
RE13	Carissa ovata	Capparis canescens				0.6	Sida fibulifera
RE14	Carissa ovata	Capparis lasiantha	Alectryon oleifolius			0.2	Sida fibulifera
RE15						1.5	
RE16						0.5	Setaria surgens
RE18	Grewia latifolia	Petalostigma pubescens	Alectryon oleifolius			0.6	Heteropogon contortus
RE19						0.5	Enneapogon avenaceus
RE20	Eremophila deserti					0.5	Digitaria divaricatissima
RE21						1.1	Digitaria divaricatissima

Site ID	G_species2	G_species3	G_species4	G_species5
RE1	Aristida calycina	Panicum decompositum	Enteropogon sp.	Enchylaena tomentosa
RE2	Salsola australis	Digitaria divaricatissima	Aristida calycina	Enchylaena tomentosa
RE3	Aristida holathera	Sida rhombifolia	Chrysopogon pallidus	Panicum decompositum
RE4	Panicum decompositum	Sida filiformis	Aristida calycina	
RE5	Heteropogon contortus	Pimelea simplex		
RE6	Sida fibulifera	Panicum decompositum		
RE7	Salsola australis	Digitaria sp.	Setaria surgeons	Sessbania sp.
RE8	Sporobolus creber	Chrysopogon pallidus	Salsola australis	Enchylaena tomentosa
RE9	Panicum decompositum	Chrysopogon pallidens,	Sida trichopoda	Sida fibulifera
RE10	Panicum decompositum	Setaria surgeons	Sida fibulifera	Enneapogon avenaceus
RE11	Panicum effusum	Elytrophorus spicatus		
RE12	Panicum decompositum	Sida fibulifera	Enneapogon gracilis	Aristida calycina
RE13	Grewia latifolia			
RE14	Enchylaena tomentosa	Salsola australis		
RE15	Atriplex eardleyae	Sesbania sp	Portulacca oleracea	
RE16	Sida rhombifolia	Sida fibulifera		
RE18	Aristida calycina	Sida fibulifera	Sida rhombifolia	
RE19	Sida rhombifolia	Aristida calycina	Panicum effusum	Sample herb
RE20	Alternanthera nana	Sida trichopoda	Panicum decompositum	Enchylaena tomentosa
RE21	Panicum effusum	Aristida ramosa	Enchylaena tomentosa	Sclerolaena bicorni

Site ID	Species list	Non-native plant cover
RE1	Aristida calycina, Sida fibulifera, Alternanthera micrantha	30-70
RE2	Sida fibulifera, Sida trichopoda, Bothriochloa bladhii, Hibiscus sturtii, Cymbidium caniculatum	5-30
RE3	Stylanthus scabra, Themeda triandra, Heteropogon contortus	5-30
RE4		5-30
RE5		30-70
RE6	Petalostylis labicheoides, Alstonia constricta	5-30
RE7	Atriplex elachophylla, Chamaesyce dallachiana, Urochloa mosanbicensis, Cenchrus ciliaris	5-30
RE8	Sida trichopoda, Digitaria spp., Dactyloctenium radulans, Sesbania sp., Panicum decompositum, Cyperus haspan, Atriplex eardleyae, Leptochloa ligulata	5-30
RE9	Panicum effusum, Enneapogon avenaceus	0-5
RE10		5-30
RE11	Cheilanthes sieberi, Micromyrtus sessilis, Bauhinia cunninghamiana,	0-5
RE12	Achyranthes aspera, Perotis rara	
RE13	Acacia excelsa, Sclerolaena bicormis, Petalostigma pubescens, Parsonsia eucalyptophylla, acacia sample	70-100
RE14		70-100
RE15		0-5
RE16		70-100
RE18		5-30
RE19	Alectryon diversifolius, burr sample, Enchylaena tomentosa	0-5
RE20	Sida fibulifera, Sesbania sp, Sporobolus crebra	5-30
RE21	Sesbania sp	30-70

Site ID	Weed species	Disturbance	Note
RE1	Cenchrus ciliaris, Eragrostis curvula	Tree thinning	
RE2	Eragrostis curvula, Opuntia stricta , Cenchrus ciliaris		
RE3	Stylosanthes scabra, Melinis repens, Urochloa mosanbiciensis	Tree clearing	
RE4	Stylosanthes scabra	Cattle	
RE5	Cenchrus ciliaris, Stylosanthes scabra, Sida cordifolia,	Cleared	
RE6	Stylosanthes scabra, Sida cordifolia,	Cleared	
RE7	Parthenium, Chloris gayana	Cleared	Gilgai
RE8	Physalis lanceifolia, Cenchrus ciliaris, Chloris gayana	Cleared	Texture contrast soil
RE9	Stylosanthes scabra, Cenchrus ciliaris	Cleared	
RE10	Cenchrus ciliaris, Opuntia stricta	Cattle	
RE11	Harrissia cactus, Megathyrsus maximus	Cattle	
RE12		Tree thinning	All populnea removed
RE13	Ipomoea sp., Cenchrus ciliaris, Urochloa mosanbiciensis, Megathyrsus maximus, Sida cordifolia, Stylosanthes scabra	Cattle, thinning	Heavily disturbed by cattle
RE14	Cenchrus ciliaris, Stylosanthes scabra, Parthenium	Cattle	
RE15	Setaria incrassata, Trianthema portulacasyrum, Parthenium	Cropping	
RE16	Urochloa mosanbiciensis, Cenchrus ciliaris, Stylosanthes scabra, Sida cordifolia	Cleared and blade plowed	
RE18	Cenchrus ciliaris, Stylosanthes scabra, Opuntia stricta	Cattle	
RE19	Cenchrus ciliaris	Feral animals, cattle , invasive weeds	
RE20	Urochloa mosanbiciensis, Chloris gayana		
RE21	Cenchrus ciliaris , Parthenium	Cleared, cattle, invasive grasses	Not hvr

Site ID	x	y
RE1	148.712168	-24.03106088
RE2	148.7052759	-24.05102525
RE3	148.6958349	-24.04477047
RE4	148.6953514	-24.04252818
RE5	148.6726396	-24.05528686
RE6	148.6673858	-24.05826426
RE7	148.6582726	-24.04443098
RE8	148.6429555	-24.03362009
RE9	148.6326963	-24.02523465
RE10	148.6321364	-24.02743689
RE11	148.6197375	-24.0165473
RE12	148.6659523	-24.02297698
RE13	148.6082302	-24.06583341
RE14	148.5706197	-24.06247222
RE15	148.5756196	-24.07702467
RE16	148.6011201	-24.06973503
RE18	148.6174707	-24.08491981
RE19	148.6174949	-24.08157029
RE20	148.6488767	-24.05926814
RE21	148.672277	-24.04879611

Site ID	RE herbari	GT RE	GT landzon	Landform	Status	Height	Percentage
Rapid1		Non-rem		4 Flat plain	Non-remnant	0-2	30 - 70
Rapid10		Non-rem		4 Clay undulating plain	Non-remnant		
Rapid11		Non/rem		4 Gently undulating plain	Non-remnant		
Rapid12		Non-rem		4 Gently undulating plain	Non-remnant		
Rapid13	11.3.1	11.3.1		3 Flood plain	Remnant		70 - 100
Rapid14		Non-rem		5 Gently undulating plain	Non-remnant	0-2	70 - 100
Rapid15		11.3.1		3 Creek bank	Remnant	Oct-30	30 - 70
Rapid16					Non-remnant		
Rapid17				5 Gently undulating plain	Non-remnant		<10
Rapid18				4	Non-remnant		
Rapid19				4 Gently undulating plain	Non-remnant		70 - 100
Rapid2		11.5.3			Remnant		
Rapid20		Non-rem		4 Gently undulating plain	Non-remnant		70 - 100
Rapid21		11.4.9		4 Gently undulating plain	Remnant		
Rapid22	11.5.3	11.5.3		5 Flat plain	Remnant	Oct-30	Oct-30
Rapid23	11.5.3	11.5.3		5 Flat plain	Remnant		70 - 100
Rapid24				4	Non-remnant		
Rapid25		Non/rem		4 Gently undulating plain	Non-remnant		
Rapid26		11.4.9		4 Gently undulating plain	Remnant		
Rapid27		11.4.9		4 Gently undulating plain	Remnant		
Rapid3	11.5.16	11.5.16		5 Depression along drainage line	Remnant	Oct-30	Oct-30
Rapid4		Na		4 Flat plain with gilgai	Non-remnant		30 - 70
Rapid5		11.4.9		4	Remnant		
Rapid6		Na		4 Flat plain	Non-remnant		
Rapid7		11.5.3		5			
Rapid8		11.5.3		5			
Rapid9				4 Flat plain	Remnant		

Site ID	Structural	TEC	TEC_name	EDL	E_species1	E_species2	E_species3
Rapid1	Grassland	no					
Rapid10	Grassland	no					
Rapid11	Grassland	no		G			
Rapid12	Grassland			G	Eucalyptus populnea	Alectryon diversifolius	Acacia debilis
Rapid13	Woodland	no			Eucalyptus coolabah		
Rapid14	Grassland	no		G			
Rapid15	Woodland	no		T1	Eucalyptus coolabah		
Rapid16							
Rapid17		no		G			
Rapid18	Grassland	no					
Rapid19	Grassland	no		G			
Rapid2	Open-woodland	no		T1			
Rapid20	Grassland	no		G			
Rapid21	Woodland	yes	Brigalow	T1			
Rapid22	Open-woodland	no		T1			
Rapid23	Woodland	no		T1			
Rapid24	Grassland	no					
Rapid25	Grassland	no		G	Eucalyptus populnea		
Rapid26	Woodland	yes	Brigalow	T1			
Rapid27	Woodland	yes	Brigalow	T1			
Rapid3	Open-woodland	no					
Rapid4	Grassland	no		G			
Rapid5	Open-woodland			T1			
Rapid6	Grassland	no		G			
Rapid7	Open-woodland	no		T1			
Rapid8	Open-woodland	no		T1			
Rapid9	Woodland	no					

Site ID	T1_species	T1_speci_1	T1_speci_2	T1_speci_3	T2_species
Rapid1					
Rapid10					
Rapid11					
Rapid12					
Rapid13	Acacia harpophylla				Terminalia oblongata subsp. oblongata
Rapid14					
Rapid15	Acacia harpophylla	Terminalia oblongata subsp. oblongata	Lysiphyllum caronnii	Melaleuca decora	
Rapid16					
Rapid17					
Rapid18					
Rapid19					
Rapid2	Eucalyptus melanophloia	Corymbia clarksoniana	Lysicarpus angustifolium		
Rapid20					
Rapid21	Acacia harpophylla	Brachychiton rupestris			
Rapid22	Corymbia clarksoniana	Callitris glaucophylla			Callitris glaucophylla
Rapid23	Acacia argyrodendron	Eucalyptus melanophloia			Acacia argyrodendron
Rapid24					
Rapid25					
Rapid26	Acacia harpophylla	Brachychiton rupestris			Geijera parviflora
Rapid27	Acacia harpophylla	Brachychiton rupestris			
Rapid3	Acacia harpophylla				Acacia harpophylla
Rapid4					
Rapid5	Acacia harpophylla	Eucalyptus woollsiana	Eucalyptus cambagiana		Acacia harpophylla
Rapid6					
Rapid7	Eucalyptus populnea	Brachychiton rupestris			Terminalia oblongata subsp. oblongata
Rapid8	Eucalyptus populnea	Brachychiton rupestris			Terminalia oblongata subsp. oblongata
Rapid9	Acacia harpophylla				Acacia harpophylla

Site ID	T2_speci_1	T2_speci_2	T2_speci_3	S1_species	S1_speci_1
Rapid1				Acacia harpophylla	
Rapid10					
Rapid11				Citrus glauca	
Rapid12				Acacia debilis	
Rapid13	Melaleuca decora	Acacia harpophylla		Eremophila deserti	
Rapid14				Carissa ovata	Capparis mitchellii
Rapid15				Terminalia oblongata subsp. oblongata	Lysiphillum carronii
Rapid16					
Rapid17					
Rapid18				Cassia brewsteri	Alectryon oleifolius subsp. elongatus
Rapid19				Grevillea striata	Hibiscus splendens
Rapid2				Cassia brewsteri	Erythroxyllum australe
Rapid20				Acacia leiocalyx	Hibiscus splendens
Rapid21				Terminalia oblongata subsp. oblongata	Geijera parviflora
Rapid22	Petalostigma pubescens	Eremophila mitchellii	Alphitonia excelsa	Acacia crassa subsp. crassa	Petalostigma pubescens
Rapid23					
Rapid24				Grewia latifolia	Acacia leiocalyx
Rapid25				Acacia harpophylla	
Rapid26	Terminalia oblongata subsp. oblongata	Eremophila mitchellii		Terminalia oblongata subsp. oblongata	Geijera parviflora
Rapid27				Terminalia oblongata subsp. oblongata	Geijera parviflora
Rapid3	Terminalia oblongata subsp. oblongata	Eremophila mitchellii		Eremophila mitchellii	Acacia harpophylla
Rapid4				Acacia harpophylla	
Rapid5	Eremophila mitchellii			Acacia crassa subsp. crassa	Geijera parviflora
Rapid6					
Rapid7				Geijera parviflora	Eremophila mitchellii
Rapid8				Geijera parviflora	Eremophila mitchellii
Rapid9	Terminalia oblongata subsp. oblongata	Geijera parviflora		Geijera parviflora	Eremophila mitchellii

Site ID	S1_speci_2	S1_speci_3	S2_species	S2_speci_1	S2_speci_2
Rapid1					
Rapid10					
Rapid11					
Rapid12			Capparis lasiantha		
Rapid13					
Rapid14					
Rapid15	Alectryon diversifolius	Alectryon oleifolius	Carissa ovata		Sesbania sp
Rapid16					
Rapid17					
Rapid18	Capparis lasiantha				
Rapid19					
Rapid2					
Rapid20			Grewia latifolia	Sida trichopoda	
Rapid21	Eremophila mitchellii	Santalum lanceolatum	Carissa ovata	Grewia latifolia	Capparis lasiantha
Rapid22	Callitris glaucophylla				
Rapid23	Thyme bush sample		Acacia crassa subsp. crassa		
Rapid24					
Rapid25					
Rapid26	Eremophila mitchellii		Carissa ovata	Grewia latifolia	Capparis lasiantha
Rapid27	Eremophila mitchellii		Carissa ovata	Grewia latifolia	Capparis lasiantha
Rapid3	Terminalia oblongata		Carissa ovata		
Rapid4			Eremophila deserti		
Rapid5	Eremophila mitchellii		Acacia crassa subsp. crassa		
Rapid6					
Rapid7	Sandalwood	Acacia debilis	Grewia latifolia		
Rapid8	Sandalwood	Acacia debilis	Grewia latifolia		
Rapid9	Alectryon oleifolius		Grewia latifolia	Carissa ovata	

Site ID	G_species1	G_species2	G_species3
Rapid1	Setaria surgens	Digitaria divaricatissima	Chrysopogon fallax
Rapid10	Sida fibulifera	Setaria surgens	
Rapid11	Setaria surgens		
Rapid12	Setaria surgens		
Rapid13	Duma florulenta		
Rapid14	Sida fibulifera	Salsola australis	Setaria surgens
Rapid15	Alternanthera nana	Arabidella eremigena	Salsola australis
Rapid16			Cultivation weeds
Rapid17	Aristida calycina	Chrysopogon pallidus	
Rapid18	Setaria surgens		
Rapid19	Aristida calycina	Panicum decompositum	Chrysopogon pallidus
Rapid2	Sida fibulifera	Portulaca oleracea	Sida rhombifolia
Rapid20	Setaria surgens	Panicum decompositum	Chrysopogon pallidus
Rapid21	Sida fibulifera	Panicum effusum	Panicum sp,
Rapid22	Themeda triandra	Heteropogon contortus	Aristida calycina
Rapid23	Sida rhombifolia	Sida fibulifera	Aristida calycina
Rapid24	Chrysopogon fallax		
Rapid25	Setaria surgens	Sclerolaena bicornis	Heteropogon contortus
Rapid26	Sida fibulifera	Panicum effusum	Panicum sp,
Rapid27	Sida fibulifera	Panicum effusum	Panicum sp,
Rapid3	Panicum effusum		Aristida ramosa
Rapid4	Chrysopogon fallax	Panicum decompositum	Setaria surgeons
Rapid5	Digitaria divaricatissima	Cyperus haspan	Panicum effusum
Rapid6	Chrysopogon fallax	Panicum decompositum	Setaria surgens
Rapid7	Sida trichopoda	Sida fibulifera	Heteropogon contortus
Rapid8	Sida trichopoda	Sida fibulifera	Heteropogon contortus
Rapid9	Sida trichopoda	Sida fibulifera	Panicum effusum

Site ID	G_species4	G_species5	Species li
Rapid1	Salsola australe	Sporobolus creber	
Rapid10			
Rapid11			
Rapid12			
Rapid13			
Rapid14			
Rapid15			
Rapid16			
Rapid17			
Rapid18			
Rapid19	Sida trichopoda	Setaria surgens	
Rapid2	Setaria surgens	Atriplex elachophylla	
Rapid20	Themeda triandra	Panicum decompositum	Zygophyllum glaucum
Rapid21	Aristida calycina		
Rapid22	Enneapogon polyphyllus	Setaria surgens	
Rapid23	Aristida caput-medusae	Panicum effusum	
Rapid24			
Rapid25			
Rapid26	Aristida calycina		
Rapid27	Aristida calycina		
Rapid3			
Rapid4	Enchylaena tomentosa	Portulacca oleracea	Sporobolus crebr
Rapid5	Salsola australe		
Rapid6			
Rapid7	Themeda triandra		
Rapid8	Themeda triandra		
Rapid9			

Site ID	Weed cover	Weed speci
Rapid1		May-30 Rhodes grass,
Rapid10	70 - 100	Cenchrus ciliaris, Stylanthes scabra,
Rapid11	70 - 100	Cenchrus ciliaris, Stylanthes scabra, Parthenium
Rapid12	70 - 100	Cenchrus ciliaris, Stylanthes scabra
Rapid13		Na
Rapid14	70 - 100	Parthenium, Cenchrus ciliaris, Sida cordifolia
Rapid15	30 - 70	Megathyrsus maximus, Parthenium,
Rapid16		May-30 Crop weeds, Chloris gayana
Rapid17		May-30 Cenchrus ciliaris
Rapid18	70 - 100	Purple siratro, Cenchrus ciliaris, Stylanthes scabra, Parthenium
Rapid19		May-30 Cenchrus ciliaris, Stylanthes scabra
Rapid2	30 - 70	Sida corfigolia, Cenchrus ciliaris, Stylanthes scabra
Rapid20		May-30 Stylanthes scabra, Cenchrus ciliaris
Rapid21		May-30 Cenchrus ciliaris
Rapid22		May-30 Stylanthes scabra,
Rapid23		
Rapid24	70 - 100	Cenchrus ciliaris, Stylanthes scabra, Sida cordifolia,
Rapid25	70 - 100	Cenchrus ciliaris, Stylanthes scabra, Parthenium
Rapid26		May-30 Cenchrus ciliaris
Rapid27		May-30 Cenchrus ciliaris
Rapid3	0-5	Opuntia stricta
Rapid4	0-5	Cenchrus ciliaris , Chloris sp
Rapid5		
Rapid6		May-30 Cenchrus ciliaris, Chloris
Rapid7		May-30 Urochloa mosanbicensis, Stylanthes scabra, Cenchrus ciliaris,
Rapid8		May-30 Urochloa mosanbicensis, Stylanthes scabra, Cenchrus ciliaris,
Rapid9	70 - 100	Megathyrsus maximus, Stylanthes scabra, Urochloa mosanbicensis

Site ID	Disturbanc	Note	x	y
Rapid1		Sandy surface texture contrast soil with volgai	148.6384033	-24.0487322
Rapid10			148.5935805	-24.0469575
Rapid11	Cleared, cattle		148.5914222	-24.0473406
Rapid12	Cattle, cleared and blade pliers		148.5574287	-24.0354411
Rapid13		Gilgai	148.5468285	-24.0566461
Rapid14	Cleared, cattle		148.5587702	-24.0479699
Rapid15	Cattle		148.5721106	-24.0807877
Rapid16	Cropping	Tilled soil	148.5598414	-24.0934692
Rapid17	Sheet erosion		148.604188	-24.0774697
Rapid18	Cleared and blade ploughed		148.6199465	-24.0776375
Rapid19	Cattle, cleared and blade ploughed		148.6419084	-24.0610696
Rapid2			148.6661241	-24.0558392
Rapid20	Cattle, cleared and blade ploughed		148.6288194	-24.068186
Rapid21	Cattle		148.6174095	-24.0822346
Rapid22			148.6868868	-24.0398841
Rapid23			148.675389	-24.027921
Rapid24	Blade plowed		148.6016905	-24.0556417
Rapid25	Cleared, cattle m, blade plowed		148.5904252	-24.0374315
Rapid26	Cattle, pigs		148.6170628	-24.0783464
Rapid27	Cattle		148.6175851	-24.0813549
Rapid3	Cattle	No gilgai observed	148.6232014	-24.019789
Rapid4	Cleared, Pliéed, cattle	Regrowth brigalow	148.6315388	-24.0346347
Rapid5	Cattle		148.6227362	-24.0398131
Rapid6	Cattle, cleared		148.6157755	-24.0368363
Rapid7	Cattle		148.6223845	-24.0531367
Rapid8	Cattle		148.6254512	-24.0540275
Rapid9	Cattle	Brigalow to the west	148.6246359	-24.0540915



Project name: Mahalo North Coal Seam Gas Project

APPENDIX C FAUNA SPECIES LIST AND TRAP SITE LOCATIONS



Fauna species data collected on Togara and Meroo Downs properties for the Mahalo North Project by Epic Environmental personnel from 4-7 April 2022 and 30 January-3 February 2023. Only species listing under the Queensland NC Act is indicated. No species listed under the Commonwealth EPBC Act were recorded.

Table B1. Fauna species list for Mahalo North Project Study area

Species name	Common name	Status - NC Act*	Apr 22		Jan-Feb 23	
			Togara	Meroo Downs	Togara	Meroo Downs
Frogs						
<i>Cyclorana alboguttata</i>	Striped Burrowing Frog	LC	X		X	
<i>Cyclorana novaehollandiae</i>	Wide-mouthed Frog	LC			X	
<i>Litoria caerulea</i>	Green Tree Frog	LC	X		X	X
<i>Litoria latopalmata</i>	Broad-palmed Rocketfrog	LC			X	
<i>Litoria peronii</i>	Peron's Tree Frog	LC			X	
<i>Limnodynastes salmini</i>	Salmon-striped Frog	LC	X		X	
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog	LC	X		X	
<i>Limnodynastes terraereginae</i>	Northern Banjo Frog	LC			X	
<i>Platyplectrum ornatum</i>	Ornate Burrowing Frog	LC	X		X	
<i>Rhinella marina</i>	Cane Toad	I	X		X	
Reptiles						
<i>Gehyra dubia</i>	Dubious Dtella	LC	X	X		
<i>Oedura monilis</i>	Ocellated Velvet Gecko	LC		X		X
<i>Cryptoblepharus pulcher</i>	Elegant Snake-eyed Skink	LC	X	X		
<i>Carlia pectoralis</i>	Open-litter Rainbow Skink	LC		X		
<i>Carlia vivax</i>	Lively Rainbow Skink	LC			X	
<i>Ctenotus allotropis</i>	Brown-blazed Wedgesnout Ctenotus	LC	X			
<i>Ctenotus robustus</i>	Robust Ctenotus	LC			X	
<i>Ctenotus taeniolatus</i>	Copper-tailed Skink	LC	X	X	X	
<i>Egernia striolata</i>	Tree Skink	LC				X
<i>Morethia taeniopleura</i>	Fire-tailed Skink	LC	X	X		
<i>Diporiphora australis</i>	Tommy Roundhead	LC	X	X	X	
<i>Pogona barbata</i>	Bearded Dragon	LC			X	X
<i>Aspidites melanocephalus</i>	Black-headed Python	LC			X	
<i>Antaresia maculosa</i>	Spotted Python	LC			X	
<i>Cryptophis boschmai</i>	Carpentaria Snake	LC			X	
<i>Demansia psammophis</i>	Yellow-faced Whipsnake	LC	X			
<i>Pseudechis guttatus</i>	Eastern Brown Snake	LC			X	
<i>Suta suta</i>	Curl Snake	LC	X			
Birds						
<i>Dromaius novaehollandiae</i>	Emu	LC		X		
<i>Anas superciliosa</i>	Pacific Black Duck	LC	X		X	
<i>Chenonetta jubata</i>	Wood Duck	LC			X	
<i>Dendrocygna arcuata</i>	Plumed Whistling Duck	LC		X	X	
<i>Coturnix ypsilophora</i>	Brown Quail	LC	X		X	X
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	LC		X		
<i>Ardea pacifica</i>	White-necked Heron	LC	X	X	X	
<i>Egretta novaehollandiae</i>	White-faced Heron	LC	X		X	
<i>Anhinga novaehollandiae</i>	Darter	LC			X	

Species name	Common name	Status - NC Act*	Apr 22		Jan-Feb 23	
			Togara	Meroo Downs	Togara	Meroo Downs
<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	LC		X	X	
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	LC			X	
<i>Aquila audax</i>	Wedge-tailed Eagle	LC	X			X
<i>Haliastur sphenurus</i>	Whistling Kite	LC	X	X	X	X
<i>Accipiter fasciatus</i>	Brown Goshawk	LC		X		
<i>Elanus axillaris</i>	Black-shouldered Kite	LC		X		X
<i>Ardeotis australis</i>	Australian Bustard	LC	X		X	
<i>Antigone rubicunda</i>	Brolga	LC	X		X	
<i>Vanellus miles</i>	Masked Lapwing	LC	X	X	X	
<i>Euseyornis melanops</i>	Black-fronted Dotterel	LC		X		
<i>Turnix velox</i>	Little Button-quail	LC				X
<i>Ocyphaps lophotes</i>	Crested Pigeon	LC	X	X	X	X
<i>Geopelia striata</i>	Peaceful Dove	LC	X		X	
<i>Geopelia humeralis</i>	Bar-shouldered Dove	LC		X	X	X
<i>Centropus phasianinus</i>	Pheasant Coucal	LC	X	X	X	X
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	LC			X	
<i>Cacomantis variolosus</i>	Brush Cuckoo	LC			X	
<i>Chalcites basalis</i>	Horsfield's Bronze-cuckoo	LC			X	
<i>Tyto javanica</i>	Eastern Barn Owl	LC	X		X	
<i>Ninox boobook</i>	Australian Boobook	LC	X		X	
<i>Podargus strigoides</i>	Tawny Frogmouth	LC			X	
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	LC	X		X	
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	LC	X	X	X	X
<i>Todiramphus macleayii</i>	Forest Kingfisher	LC			X	
<i>Todiramphus pyrrophygius</i>	Red-backed Kingfisher	LC	X			
<i>Merops ornatus</i>	Rainbow Bee-eater	LC			X	X
<i>Eurystomus orientalis</i>	Dollarbird	LC			X	
<i>Falco cenchroides</i>	Nankeen Kestrel	LC	X	X		X
<i>Falco berigora</i>	Brown Falcon	LC	X	X	X	X
<i>Falco longipennis</i>	Australian Hobby	LC				X
<i>Nymphicus hollandicus</i>	Cockatiel	LC	X	X	X	X
<i>Eolophus roseicapilla</i>	Galah	LC	X	X	X	X
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	LC	X		X	
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet	LC			X	
<i>Aprosmictus erythropterus</i>	Red-winged Parrot	LC	X	X	X	
<i>Platyercus adscitus</i>	Pale-headed Rosella	LC	X	X	X	X
<i>Chlamydera maculatus</i>	Spotted Bowerbird	LC	X	X	X	
<i>Oriolus sagittatus</i>	Olive-backed Oriole	LC			X	
<i>Malurus assimilis</i>	Purple-backed Fairy-wren	LC	X	X		
<i>Malurus melanocephalus</i>	Red-backed Fairy-wren	LC			X	X
<i>Lichmera indistincta</i>	Brown Honeyeater	LC		X	X	
<i>Plectorhyncha lanceolata</i>	Striped Honeyeater	LC	X	X	X	X
<i>Philemon citreogularis</i>	Little Friarbird	LC		X	X	
<i>Philemon corniculatus</i>	Noisy Friarbird	LC			X	X
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	LC	X		X	X
<i>Melithreptus albogularis</i>	White-throated Honeyeater	LC	X		X	
<i>Manorina flavigula</i>	Yellow-throated Miner	LC	X	X	X	X
<i>Gavicalis virescens</i>	Singing Honeyeater	LC	X	X	X	X


Species name	Common name	Status - NC Act*	Apr 22		Jan-Feb 23	
			Togara	Meroo Downs	Togara	Meroo Downs
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	LC			X	
<i>Pardalotus striatus</i>	Striated Pardalote	LC	X		X	
<i>Smicrornis brevirostris</i>	Weebill	LC	X	X	X	
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	LC	X		X	
<i>Acanthiza nana</i>	Yellow Thornbill	LC			X	
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	LC	X	X	X	X
<i>Artamus cinereus</i>	Black-faced Woodswallow	LC		X	X	X
<i>Cracticus torquatus</i>	Grey Butcherbird	LC	X	X		
<i>Cracticus nigrogularis</i>	Pied Butcherbird	LC	X	X	X	X
<i>Gymnorhina tibicen</i>	Australian Magpie	LC	X	X	X	X
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	LC	X	X	X	X
<i>Coracina papuensis</i>	White-bellied Cuckoo-shrike	LC	X			
<i>Pachycephala rufiventris</i>	Rufous Whistler	LC	X	X	X	X
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	LC	X		X	X
<i>Rhipidura albiscapa</i>	Grey Fantail	LC	X			
<i>Rhipidura leucophrys</i>	Willie Wagtail	LC	X	X	X	X
<i>Grallina cyanoleuca</i>	Magpie-Lark	LC	X	X	X	X
<i>Myiagra inquieta</i>	Restless Flycatcher	LC	X			
<i>Myiagra rubecula</i>	Leadend Flycatcher	LC			X	X
<i>Corvus coronoides</i>	Australian Raven	LC	X	X	X	
<i>Corvus orru</i>	Torresian Crow	LC	X	X	X	X
<i>Struthidea cinerea</i>	Apostlebird	LC	X	X	X	X
<i>Microeca fascians</i>	Jacky Winter	LC	X			
<i>Petroica goodenovii</i>	Red-capped Robin	LC	X			
<i>Dicaeum hirundinaceum</i>	Mistletoebird	LC				X
<i>Mirafrava javanica</i>	Horsfield's Bushlark	LC	X	X	X	X
<i>Megalurus mathewsi</i>	Rufous Songlark	LC			X	X
<i>Cisticola exilis</i>	Golden-headed Cisticola	LC				X
<i>Petrochelidon nigricans</i>	Tree Martin	I	X			
<i>Acridotheres tristis</i>	Common Myna	LC	X	X	X	X
<i>Neochmia modesta</i>	Plum-headed Finch	LC			X	X
<i>Taeniopygia guttata</i>	Zebra Finch	LC	X	X	X	X
<i>Taeniopygia bichenovii</i>	Double-barred Finch	LC	X	X	X	X
<i>Anthus australis</i>	Australian Pipit	LC		X	X	X
Mammals						
<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	SLC	Tracks		X	
<i>Aepyprymnus rufescens</i>	Rufous Bettong	LC	Tracks			
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	LC	X	X	X	
<i>Chaerophon jobensis</i>	Greater Northern Free-tailed Bat	LC	X		X	
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail Bat	LC	X		X	
<i>Ozimops lumsdenae</i>	Northern Free-tailed Bat	LC	X		X	
<i>Ozimops ridei</i>	Ride's Free-tailed Bat	LC	X		X	
<i>Chalinolobus gouldi</i>	Gould's Wattle-tail Bat	LC	X		X	
<i>Chalinolobus morio</i>	Chocolate Wattle-tail Bat	LC	X		X	
<i>Chalinolobus picatus</i>	Little Pied Bat	LC	X		X	
<i>Miniopterus orianae oceanensis</i>	Eastern Bentwing Bat	LC	X		X	

Species name	Common name	Status - NC Act*	Apr 22		Jan-Feb 23	
			Togara	Meroo Downs	Togara	Meroo Downs
<i>Nyctophilus sp.</i>	long-eared bat species	LC	X		X	
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	LC	X		X	
<i>Scotorepens greyii</i>	Little Broad-nosed Bat	LC	X		X	
<i>Mus musculus</i>	House Mouse	I			X	
<i>Oryctolagus cuniculus</i>	Rabbit	I	X		X	
<i>Canis lupus dingo</i>	Dingo			X		
<i>Felis catus</i>	Cat	I	X	X		
<i>Sus scrofa</i>	Pig (scats)	I	Scats	X		

*Status abbreviations: LC = Least Concern; I = Introduced

Table B2. Trap site description and species data (January-February 2023)

Site/coordinates	Description/species recorded	Photo
Site 1 -24.0562 148.64384	<p>Funnel trap line: small patch of Brigalow with scattered Blackbutt located adjacent to small waterhole on lower slope of farm dam area. Tall grass and dense aquatic vegetation present.</p> <p>Elliott trap line located in nearby patch of relatively intact Poplar Box woodland.</p> <p>Species recorded: Striped Burrowing Frog, Wide-mouthed Frog, Green Tree Frog, Salmon-striped Frog, Northern Banjo Frog, Ornate Burrowing Frog, Lively Rainbow Skink, Robust Ctenotus, House Mouse.</p>	
Site 2 -24.0486 148.6723	<p>Funnel trap line: small waterhole in gilgai along drainage area. Dense grass and aquatic vegetation present. Very little woody vegetation present (scattered regrowth Brigalow).</p> <p>Species recorded: Striped Burrowing Frog, Green Tree Frog, Spotted Grass Frog</p>	
Site 3 -24.03338 148.65908	<p>Funnel trap line: large waterhole in wide shallow gilgai. Water present in other gilgais surrounding site. Dense grass and aquatic vegetation present but patchy. Cattle disturbance present. Some woody vegetation present (scattered regrowth Brigalow).</p> <p>Species recorded: Striped Burrowing Frog, Wide-mouthed Frog, Broad-palmed Rocket Frog, Peron's Tree Frog, Ornate Burrowing Frog</p>	

Site/coordinates	Description/species recorded	Photo
<p>Site 4 -24.05416 148.63689</p>	<p>Funnel trap line: large waterhole in wide shallow gilgai. Dense grass and aquatic vegetation present. Very little woody vegetation present (scattered regrowth Brigalow).</p> <p>Species recorded: Green Tree Frog, Salmon-striped Frog, Northern Banjo Frog, Carpentaria Snake.</p>	





Project name: Mahalo North Coal Seam Gas Project

APPENDIX D DES Landscape Fragmentation and Connectivity Tool Output



SIGNIFICANCE TEST ONE

The regional total area is 228048.76

The regional extent of core remnant is 25743.36

The regional extent of core remnant is 11.29 percent

This level of regional fragmentation sets a local impact threshold of: 5.0 percent

The table below lists the local impact thresholds for categories of regional core remnant extent:

REGIONAL CORE CATEGORY	LOCAL IMPACT THRESHOLD
< 10	2.0
10 - 30	5.0
30 - 50	10.0
50 - 70	20.0
70 - 90	30.0
>90	50.0

Area of core at the local scale (pre impact): 3548.41

Area of core at the local scale (post impact): 3538.3

Percent change of core at the local scale (post impact): 0.28 percent

SIGNIFICANCE TEST TWO

The number of core remnant areas occurring on the site: 3

The number of core remnant areas remaining on the site post impact: 3

(Only core polygons greater than or equal to 1 hectare are included)

RESULT

14:31:13 This analysis has determined any impact on connectivity areas is NOT significant
(A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is False)

CONTACT US

🌐 www.epicenvironmental.com.au

☎ X800 779 363

✉ enquiries@epicenvironmental.com.au

<http://www.epicenvironmental.com.au/>