

## **Appendix A Smoky Creek Power Station Habitat Assessment and Targeted Survey report (Terra Solutions 2023)**



# SMOKY CREEK SOLAR POWER STATION HABITAT ASSESSMENT AND TARGETED SURVEY

Edify Energy Pty Ltd



202104

Smoky Creek Solar Power  
Station Habitat Assessment and  
Targeted Survey

09/03/2023

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## Approval for issue

Approver	Signature	Approval date
A. Fitzgerald		09/03/2023

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# 1 INTRODUCTION

Edify Energy Pty Ltd (Edify) propose to construct and operate a solar power station on land located at 460 Dodson's Road, off the Burnett Highway, approximately 15 km south-east of the township of Dixalea (Figure 1). The maximum extent of the project area may incorporate up to seven properties Lot 39 on RN395; Lot 28 on RN211; Lot 18 on RN271; Lot 37 on RN1147; Lot 29 on RN210; Lot 32 on RN194; Lot 33 on RN210. The project is formally known as the Smoky Creek Solar Power Station (the Project) and pending final approval would be in the Banana Local Government Area in central Queensland.

The project is to be located at and will provide energy generation and supply to national electricity grid.

## 1.1 Purpose and scope of work

The purpose of this ecological assessment report is to provide further ecological information in response the request for information by preliminary documentation provided by Department of Climate Change, Energy, the Environment and Water (DCCEEW) in response to the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral (2021/9030). The ecological assessment builds on work undertaken by RPS (2018) with the primary focus of describing the ecological values as they relate to the following MNES threatened species:

- *Solanum dissectum* – Endangered
- *Solanum johnsonianum* – Endangered
- Ornamental Snake (*Denisonia maculata*)
- Squatter Pigeon (southern) (*Geophaps scripta scripta*)

The scope of works included the following tasks:

- Desktop assessment of background information and legislative/policy documents along with Commonwealth and State mapping layers and databases.
- Ecological assessment including a habitat assessment and targeted investigations for *Solanum dissectum*, *Solanum johnsonianum*, ornamental snake and squatter pigeon.
- Prepare a report detailing the methodology, results, and habitat mapping.

## 1.2 Project location and tenure

The Project site is located approximately 37 km north-northwest of Biloela and 13 km northeast of Goovigen in the Banana Shire Council Local Government Area in central Queensland (Figure 1). The total development footprint may be up to 2,240 ha depending on the outcome of the ecological assessment and the requirement to avoid sites of ecological value.

The Project site consists of six freehold lots ranging from 129.2 ha to 1,563.7 ha. Four of the allotments are entirely contained within the project area and the remaining three allotments extend beyond the project boundary (Figure 1).

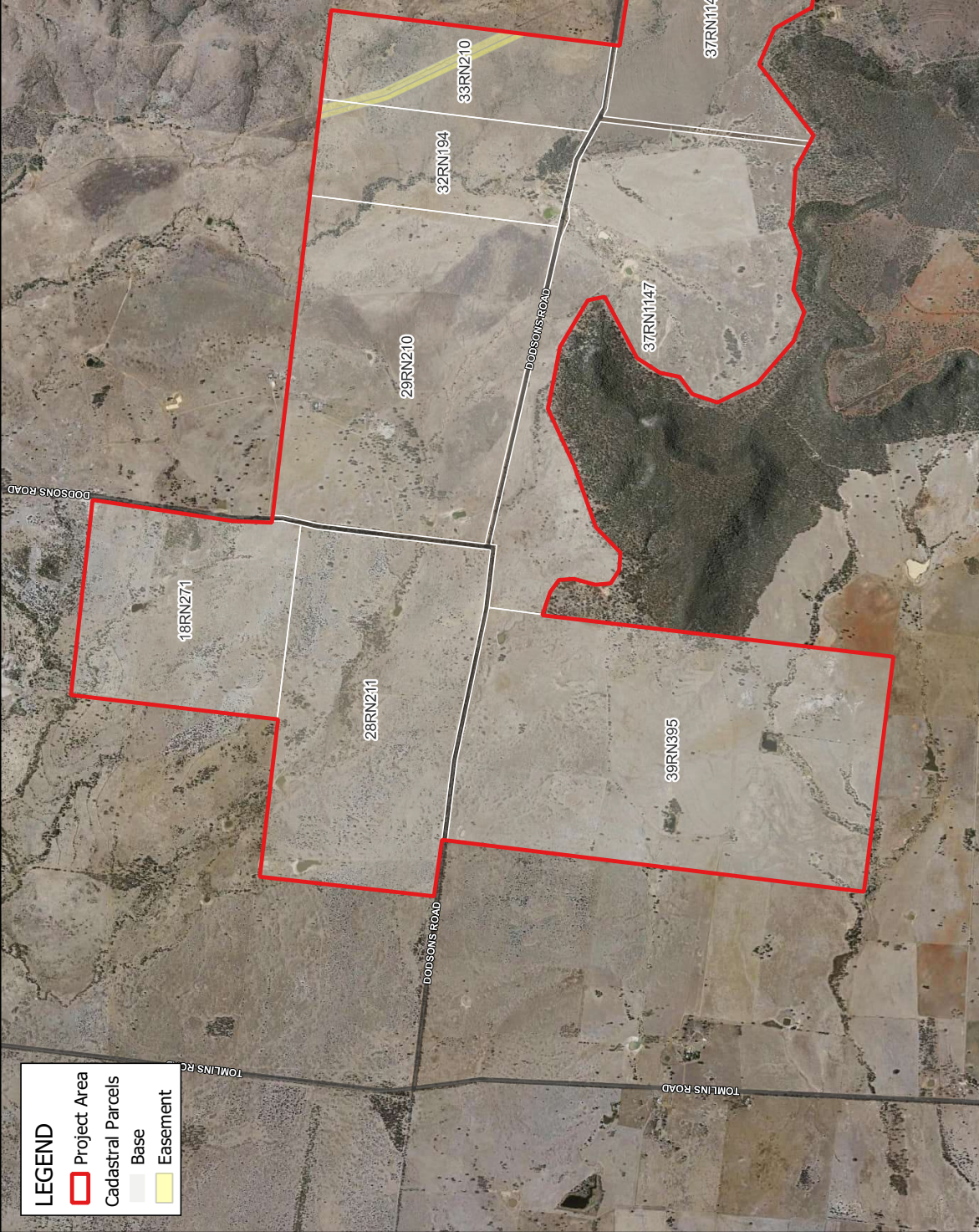
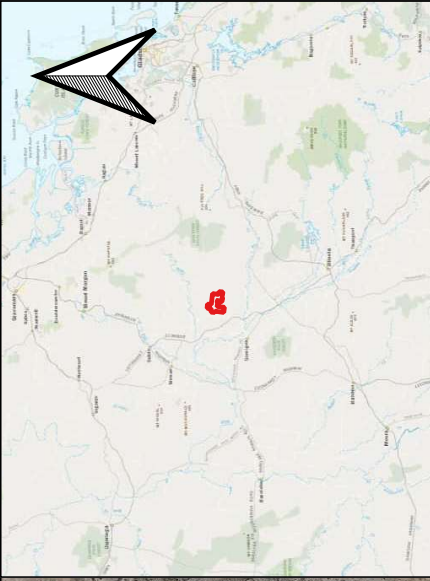
**Table 1 Description of subject allotments**

Lot	Plan	Tenure	Total Area (ha)	Total in Project area
18	RN271	Freehold	354.3	210.6
28	RN211	Freehold	517.0	333.5
29	RN210	Freehold	393.7	393.7
32	RN194	Freehold	130.9	130.9

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Lot	Plan	Tenure	Total Area (ha)	Total in Project area
33	RN210	Freehold	129.2	129.2
37	RN1147	Freehold	1,563.7	558.3
39	RN395	Freehold	513.1	513.1





**LEGEND**

- ▭ Project Area
- Cadastral Parcels
- Base
- Easement

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Coordinate system: GDA94 / MGA zone 56 EPSG:28356

**CLIENT: EDIFY ENERGY**

**FIGURE 1: PROJECT LOCATION**

0 1 2 3 4 5 km

1:30,000



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DATE: 06/04/2022

AUTHOR: Anton



## 1.3 Project description

The Smoky Creek Solar Power Station will consist of the following elements:

- Solar photovoltaic panels
- Battery energy storage system (BESS)
- Electrical substation
- New overhead powerline connecting to the 275 kV Calvale to Stanwell transmission line
- Transmission infrastructure
- Site buildings and storage areas
- Laydown and construction compound
- Access tracks

### 1.3.1 Project construction

The construction process will generally be undertaken in the following order of works although some activities will be undertaken in parallel:

- Site office and amenities set up
- Vegetation removal and grubbing
- Construction of laydown areas
- Fencing construction
- Road construction
- Pile installation
- Trenching and underground cable installation
- Mechanical installations
- Solar module installation
- Inverter installation
- Battery system installation
- Construction of control building, HV switch room and spare parts building
- Testing and commissioning

Construction will be undertaken in accordance with a range of management plans once they have been developed. It is proposed that these plans are finalised on completion of the approvals process with significant levels of detail provided in the response by Preliminary Documentation. This will give the project proponent and regulators some certainty about the extent of the final project area and avoiding ongoing amendments to the plans.

- Construction Phase Environmental Management Plan
- Pest and Weed Management Plan
- Bushfire Management Plan
- Erosion and Sediment Management Plan
- Landscaping Plan



### 1.3.2 Project operation and maintenance

The Smoky Creek Solar Farm is expected to operate for approximately 30 years with the following operation activities continuous over this period:

- Monitoring and control of the solar farm
- Maintenance activities

An operational environmental management plan will be developed to avoid, minimise, and reduce impacts to the environment during the operational phase of the project.

### 1.3.3 Decommissioning

On completion of the operational phase of the solar facility it will be decommissioned. The process will include the removal of all above and below ground infrastructure from the site. Spent materials from the solar farm will be sorted into various waste streams to be recycled or disposed of at a waste facility.

### 1.3.4 Rehabilitation

On decommissioning the land will be reinstated to the pre-development land use. Ground disturbance associated with the operation or decommissioning of the solar farm will be remediated through the placement levelling of topsoil and then reseeded with pasture grasses. All onsite rehabilitation will be undertaken in accordance with a Site Rehabilitation Plan.

## 1.4 Existing approvals

The Smoky Creek Solar PV Power Station (Solar Farm) and Associated Facility Switchyard and Electrical Transmission obtained final planning approval on 11 December 2019 under the *Planning Regulation 2017* (Queensland) and in accordance with the Banana Shire Planning Scheme.

The development approval was given for Material Change of Use for a Public Facility (Impact assessable) and Reconfiguring a Lot for Subdivision by Agreement and is to be completed in general accordance with the plans, reports and conditions included in the approval.

An EPBC Act referral (2021/9030) was submitted to the DCCEEW on 27 September 2021 and received a Controlled Action decision (Preliminary Documentation) on 26 October 2021.

## 2 RELEVANT LEGISLATION

This section provides a summary of the key environmental legislation, policies and plans related to the proposed development (Table 2). Since the report is in response to an RFI by DAWE under the EPBC Act the report is written in this context.

**Table 2 Relevant legislation**

Legislation	Brief description
<b>Commonwealth Legislation</b>	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	<p>The EPBC Act is the key piece of Commonwealth environmental legislation. It provides a legal framework to protect and manage the following nine matters of national environmental significance (MNES):</p> <ul style="list-style-type: none"> <li>• Listed critically endangered, endangered and vulnerable species and communities</li> <li>• Listed migratory species</li> <li>• Ramsar wetlands of international importance</li> <li>• Commonwealth marine environment</li> <li>• World heritage properties</li> <li>• National heritage places</li> <li>• The great barrier reef marine park</li> <li>• Nuclear actions</li> <li>• Water resources in relation to coal seam gas development and large coal mining developments.</li> </ul> <p>Under the EPBC Act, an action that has, will have, or is likely to have a significant impact on any MNES or other protected matters must not be undertaken without approval from the Commonwealth Minister for the Environment.</p> <p>Before a proponent can lawfully undertake an action that may have a significant impact on a MNES, the action must be referred to the minister for consideration. If it is determined that an action is likely to have a significant impact on MNES it is categorised as a 'controlled action' requiring assessment and approval under the EPBC Act. This impact assessment may be undertaken in accordance with a relevant bilateral agreement between the commonwealth and a state or territory.</p>

## 3 METHODS

### 3.1 Desktop assessment

The updated desktop assessment included a review of supporting material primarily relating to the Matters of National Environmental Significance (MNES) addressed in the report. These materials include but are not necessarily limited to the following mapping, databases and reports:

- Aerial imagery of the site to broadly assess vegetation within and surrounding the site
- Wildlife online (Appendix B) and Atlas of Living Australia databases. These databases hold records of plants and animals that have either been sighted or collected within a given radius of the site, noting that Wildlife online have higher reliability.
- Matters of National Environmental Significance database (Appendix A). The MNES search uses species records and applies a range of bio-models to predict the presence of MNES within a given radius of the site, including:
  - Listed threatened ecological communities
  - Listed threatened species
  - Listed migratory species.
- Soils of the Banana Area Central Queensland (Muller 2008) and geological datasets
- Inland waters including drainage boundaries, watercourses, and other wetland features (Queensland Globe)
- A review of relevant legislation and associated plans and policies associated with the EPBC Act including, but not limited to:
  - EPBC Act - Draft Referral guidelines for the nationally listed Brigalow Belt reptiles
  - EPBC Act – Survey guidelines for Australia’s threatened birds
  - EPBC Act – Sprat profiles.

### 3.2 Site investigation

A site inspection of the project area was undertaken by ecologists Anton Fitzgerald (Terra Solutions) and Simon Danielsen (Astrebla Ecological Services) over five days from 7 – 11 February 2022. A second site inspection of the project area was undertaken by ecologists Anton Fitzgerald (Terra Solutions) and Keeleigh Parison (Terra Solutions) over four days from 13 – 16 February 2023.

A ground traverse of the proposed clearing footprint was undertaken including an examination of onsite vegetation communities and fauna habitat values. Traverses were undertaken on foot and using a side-by-side vehicle (UTV) which enabled excellent access to the best on offer habitats.

The fauna habitat assessment targeted a range of critical microhabitat features typically associated with threatened species including, but not limited to the primary target species *Solanum dissectum*, *Solanum johnsonianum*, Ornamental Snake and Squatter Pigeon (southern).

On ground surveys were used to verify the various layers assessed in the desktop assessment including important features associated with geology, soil type, water resources and vegetation communities.

Surveys undertaken from 13 – 16 February were focused on confirming the presence of ornamental snake.

### 3.2.1 Vegetation and flora survey methods

Vegetation communities discernible in the field were surveyed using the outline for recording quaternary type information as defined by the 'Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland' (Neldner et al. 2019).

Representative survey sites were identified using aerial imagery of the project area and a review of available literature. Survey sites were positioned to ensure that the range of vegetation communities present in the project area was adequately surveyed. Where possible the probable locations of important/sensitive habitats were also identified.

In total 88 representative survey sites were assessed using a combination of aerial imagery and field data. Survey sites were positioned to ensure that all vegetation communities present in the project area were assessed and sites were accessible. The potential locations of important or sensitive habitats were identified during the desktop assessment and targeted for field assessment.

At each vegetation survey site ecologists verified the floristic structure and composition of vegetation communities. Common flora species from each structural layer were recorded and stratified descriptions were prepared for all sites. Photographic points were also recorded in instances where the community had already been well described. The location of survey sites is shown in Figure 2.

The habitat assessment focused on identifying broad scale and important microhabitat features associated with the threatened species identified in the preliminary documentation request, with a focus on the following features for the respective species.

### 3.2.2 Threatened flora surveys

Targeted searches were undertaken for *Solanum johnsonianum* and *Solanum dissectum* at all vegetation survey sites using 10-minute meandering transects. More substantial searches were undertaken throughout brigalow habitats and brigalow with SEVT understorey. Due to the small size of these communities the whole area could be adequately searched.

The survey timing was suitable for both species. All *Solanum*'s thrive in the hotter months of the year and especially following substantial rainfall. In the months leading up to the field survey there had been significant rainfall making survey conditions ideal.

### 3.2.3 Targeted threatened fauna surveys

- Targeted searches for fauna squatter pigeon used a combination of the following methods:
- Area searches were undertaken in all areas of suitable habitat and more generally at all vegetation survey sites and photograph sites using visual and auditory methods of detection.
- Slow-driving transects were utilised to cover large areas of the project area and has proven to be an excellent method of detection for the species which is often observed dust bathing on access tracks.
- Waterhole surveys were undertaken at dam sites with woodland or forest vegetation nearby.

Targeted searches for ornamental snake used a combination of the following methods:

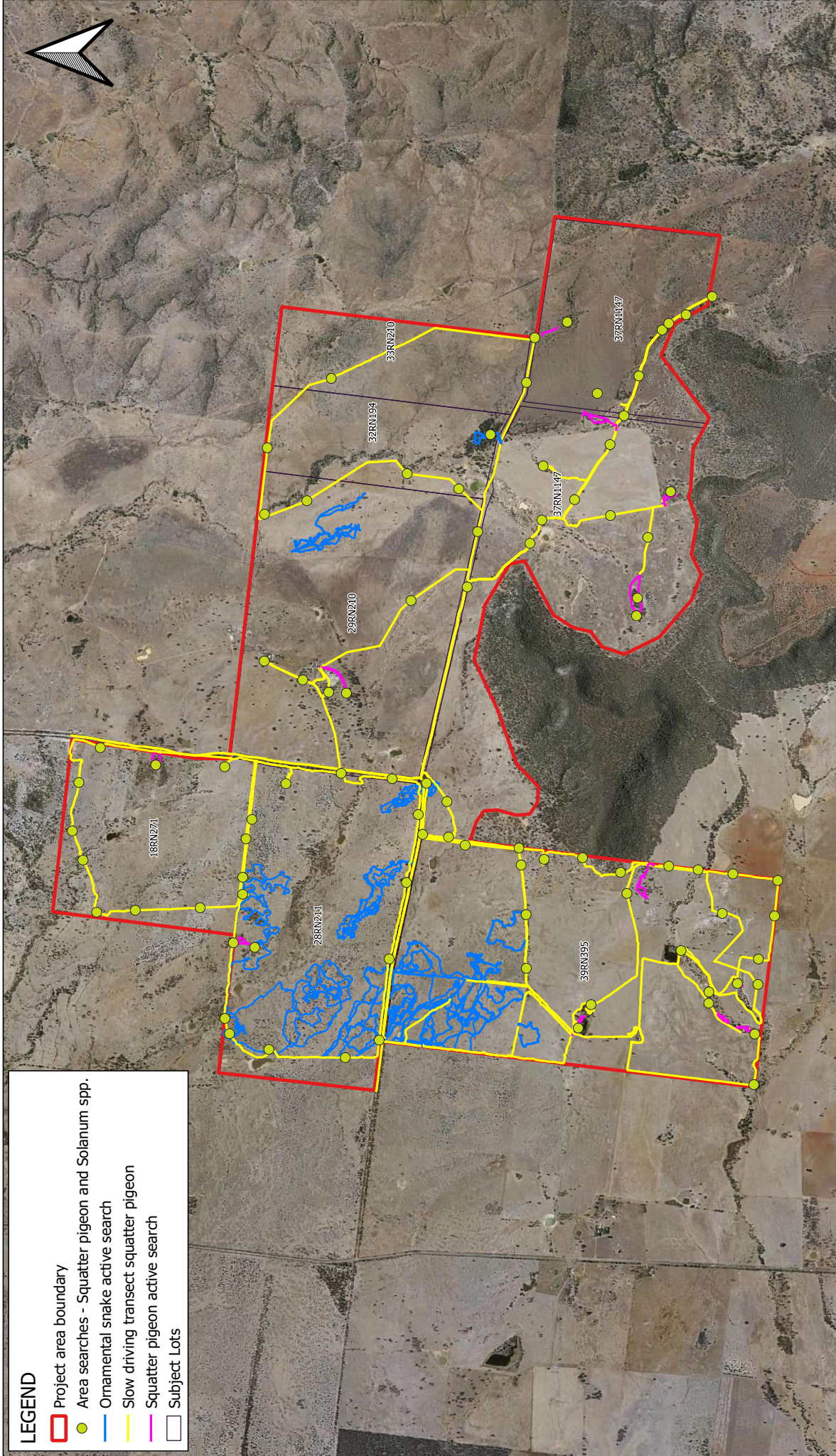
- Spotlighting surveys on foot within and around gilgai wetlands particularly in areas where frogs were active.
- Spotlighting surveys on foot of the gilgai mounds and gilgai flats
- Slow-driving spotlighting surveys within gilgai habitats and along tracks and roads proximate to suitable habitat using a UTV vehicle.

The survey locations are presented in Figure 2.



**LEGEND**

- Project area boundary
- Area searches - Squatter pigeon and Solanum spp.
- Ornamental snake active search
- Slow driving transect squatter pigeon
- Squatter pigeon active search
- Subject Lots



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Coordinate system: GDA2020 / MGA zone 56 EPSG:7856

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FIGURE 2: SURVEY LOCATIONS AND TRACKS



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DATE: 09/03/2023 AUTHOR: Anton Fitzerald



## 4 EXISTING ENVIRONMENT

### 4.1 Climate

The climate of the Banana local government area is typically classified as semi-arid with a summer dominant rainfall. Annual rainfall from the nearby Bureau of Meteorology Station at Goovigen (1973 – 2023) is 698.1 mm and on average 70% of annual rain falls between October and March (Table 3). Winter rainfall is generally reliable in the area despite being somewhat reduced. Summers are hot with average monthly with at least one heat wave each summer and frosts occur on the low-lying country between May and September (Muller 2008). The mean monthly maximum and minimum temperatures and daily pan evaporation for Thangool Airport (BOM Station 039089) is presented in

Table 4.

In the months leading up to the February 2022 survey, monthly rainfall totals at nearby Goovigen (BOM Station 039048) were very high. A total of 91.8 mm fell in October 2021, only slightly below the 90<sup>th</sup> percentile of 106.0 mm. Following this 247.4 mm fell in November which was the highest monthly total ever recorded at the station and almost 100 mm than the 95<sup>th</sup> percentile for November (154.4 mm). Significant rains also fell in December when 151.8 mm fell, only slightly below the 90<sup>th</sup> percentile for that month (160.6 mm).

Substantial rainfall had ceased when the February 2022 survey commenced, and no rain fell in the project area during the survey whilst only 0.2 mm was recorded at Goovigen (Table 5). Maximum temperatures were generally consistent with February average although minimum temperatures fell well below the February average during the night (Table 5).

In the months leading up to the 2023 survey monthly rainfall totals at nearby Goovigen (BOM Station 039048), rainfall varied. A total of 112.0 mm fell in October 2022, which is above the 90<sup>th</sup> percentile of 106.0 mm. Meanwhile, 64.4 mm fell in December, which was below the mean of 100.9 mm.

Rain and thunderstorms occurred at the site and in the local area during the survey. At Thangool Airport a total of 9.8 mm fell during the survey period (Table 6). Maximum temperatures exceeded the February average, except for the 15<sup>th</sup> of February (32.4 °C). Similarly minimum temperatures fell below the February average during the night, except for the 15<sup>th</sup> of February (20.4 °C) (Table 6).

**Table 3 Rainfall statistics for Goovigen (BOM Station 039048) calculated for 1973 - 2023**

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	97.0	109.9	73.3	36.1	36.4	32.7	29.0	25.3	24.2	56.1	73.8	100.9	698
Lowest	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	3.5	301
10th %ile	24.8	20.9	9.4	2.5	1.3	1.4	0.0	0.0	0.0	8.4	14.5	28.1	491
Median	79.5	87.8	51.9	25.5	29.0	18.9	14.4	17.3	11.6	50.3	70.9	84.6	672
90th %ile	199.8	229.2	160.6	77.2	72.4	81.8	90.4	70.4	63.0	106.0	135.5	160.6	1005
95th %ile	223.1	286.7	217.2	104.1	93.5	96.0	105.3	77.0	87.6	133.1	154.4	236.5	1058
Highest	355.6	404.8	321.2	181.8	236.4	153.0	235.8	99.4	158.7	199.4	247.4	447.2	1206

**Table 4 Climate statistics from Thangool Airport (BOM Station 039089) calculated for 1992 - 2020**

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C)	33.8	33.1	32.0	29.6	26.3	23.4	23.3	25.0	28.2	30.6	32.0	33.2	29.2
Mean minimum temperature (°C)	19.7	19.8	18.0	14.1	9.9	7.1	5.8	6.4	9.8	13.6	16.4	18.7	13.3
Mean daily evaporation (mm)	7.4	6.6	6.4	5.1	4.0	2.9	3.1	4.0	5.5	6.7	6.8	7.4	5.5
Average days with Max temperature >35°C	11.2	7.6	3.9	0.2	0.0	0.0	0.0	0.0	0.3	1.8	4.7	7.9	37.6
Average days with a Min temperature < 2°C	0.0	0.0	0.0	0.0	0.1	1.3	2.9	1.7	0.1	0.0	0.0	0.0	6.1

**Table 5 Weather data during the survey periods 7 – 11 February 2022**

Statistic	7 <sup>th</sup> Feb	8 <sup>th</sup> Feb	9 <sup>th</sup> Feb	10 <sup>th</sup> Feb	11 <sup>th</sup> Feb	Feb mean (all years)
Rainfall (mm) – BOM Station 039048	0	0.2	0	0	0	109.9
Maximum temperature (°C) - BOM Station 039089	30.8	31.0	33.7	33.9	33.7	33.1
Minimum temperature (°C) - BOM Station 039089	15.1	15.8	14.4	16.4	13.7	19.8

**Table 6 Weather data during the survey period 13 – 16 February 2023**

Statistic	13 <sup>th</sup> Feb	14 <sup>th</sup> Feb	15 <sup>th</sup> Feb	16 <sup>th</sup> Feb	Feb mean (all years)
Rainfall (mm) – BOM Station 039089	0	0	9.6	0.2	93.0
Maximum temperature (°C) - BOM Station 039089	37.9	38.1	32.4	33.3	33.1
Minimum temperature (°C) - BOM Station 039089	19.4	19.0	20.4	19.0	19.8

## 4.2 Topography

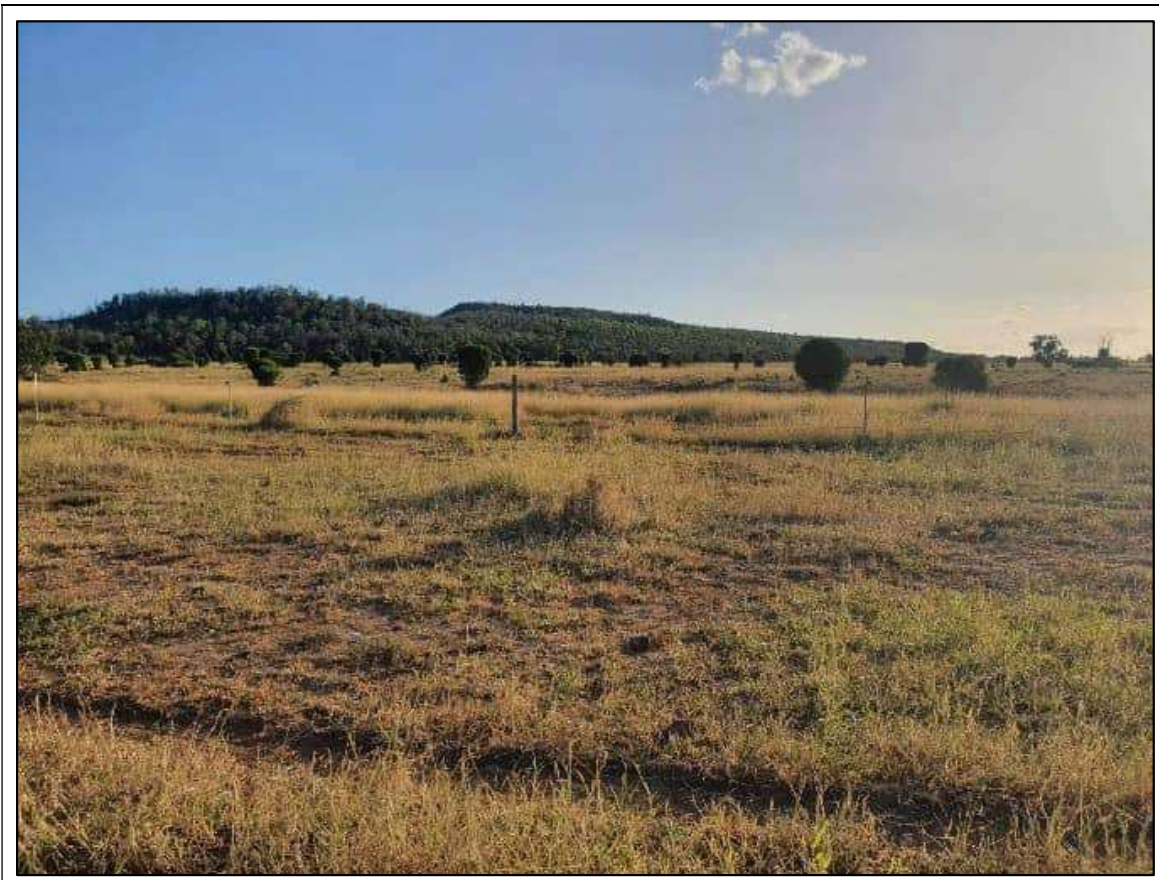
Site elevation ranges from approximately 250 m AHD from hilly country in the extreme east of Lot 37 to 155 m AHD (Plate 1a) and on Lot 18 and 28 in the north-west.

Undulating plains are dominant in Lot 28, Lot 32, Lot 33 and Lot 37 and the eastern parts of Lot 28 (Plate 1b) where they decline in elevation from the west and north-west (around 220 m AHD to 170 m AHD). The project area flattens to level and gently undulating plains in the western parts of the site including most of Lot 39 and the Lot 28 (Plate 1c).

Gilgai microrelief is present in the west of Lot 28 and the north-west of Lot 39 (Plate 1d). The steepest sections of the site are associated with the lower slopes of a lateritic tableland occurring south of Lot 37 with the steepest sections outside of the project area (Plate 1e) (Figure 3).

	
<p>1a Slight rises in hilly country to the east of the project area</p>	<p>1b Undulating plains central to the site</p>
	
<p>1c Flat to gently undulating plain</p>	<p>1d Gilgai microrelief</p>





1e Lateritic tableland south of the project area

#### Plate 1 Project area landforms

### 4.3 Geology

The site is located within the Rockhampton Subprovince (Yarrol Province) of the New England orogenic belt. The New England Orogen formed through tectonic movement and crustal development primarily in the Silurian (444 - 419 million years ago (Mya)) -Triassic period (252 – 201 Mya) and is recognised as the youngest and most complex of the three major recognised Orogens in Queensland. It extends over approximately 1300 km along the eastern margin of Australia from Bowen in Queensland to Newcastle in NSW (Flood and Aitchison 1993).

The Rockhampton Subprovince was formed as a forearc basin between (383 – 323 Mya) through deposition of volcanoclastic sediments, oolitic limestone and volcanic formations (Murray 1975). The Rockhampton Subprovince is separated the ranges of the Auburn Arch and Gogango Overfolded Zone to the west by the Grantleigh Subprovince (Early Permian 299 – 283 Mya) which is a deep basin of volcanoclastic sediments that overlay older rocks of the Rockhampton Subprovince.

Detailed surface geological mapping of the site identifies five distinct rock units that underly the site (i.e. Biloela formation, Smoky beds, Qpa-QLD, Balaclava formation and Pg/g?-YARROL/SCAG) (Table 7 and Figure 3). Except for the granitoid unit Pg/g?-YARROL/SCAG, all rock units are sedimentary with variable age and composition (Murray 1975).

The Qpa-QLD unit is the most recent geological formation and is associated with alluvial deposits of gravel, sand, silt and clay were laid down as the major floodplain of the Callide Creek. The Callide floodplain alluvium has an average thickness of 17 m (Murray 1975).

The Biloela formation occupies most of the site consisting of a recent arenite-mudrock formation (25 +/- 4 Mya) to approximately 350 m thick. Arenites and mudrocks typically form through the deposition and accumulation of sediment with subsequent cementation and in this case formed in freshwater (Murray 1975).

The Pg/g intrusive granitoid is located to the southeast of the site and only slightly intersects the site.

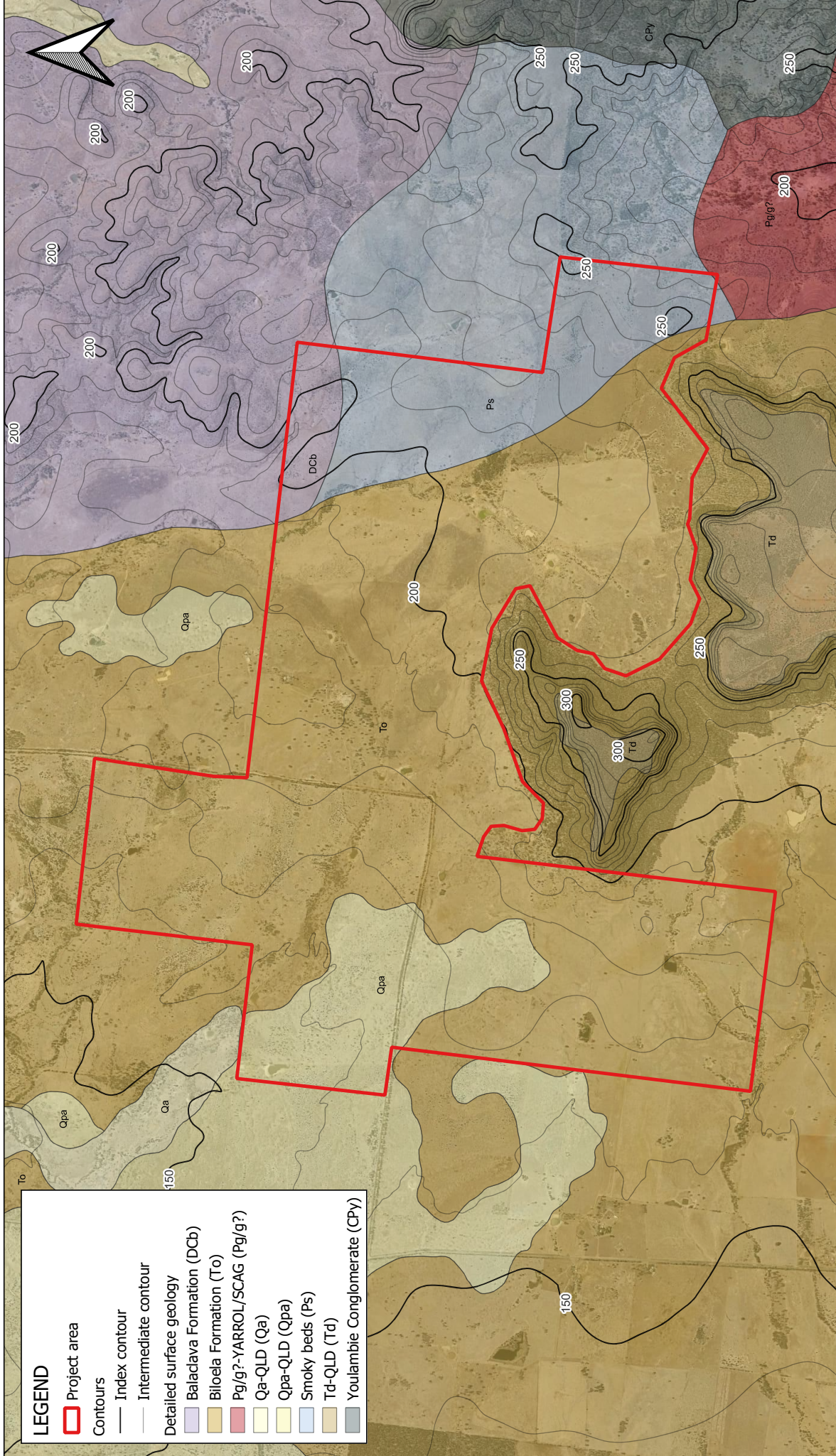
The Smoky beds, located in the eastern extent of the site are older (formed 272 – 299 Mya) and form a hilly topography of benches and flat-topped hills which extend some distance to the east of the project area. The Smoky beds consist of mafic material rich in magnesium and iron (Murray 1975).

The Balaclava formation occupies approximately 56 ha of the project area and is the oldest rock unit on the site (346 - 382 Ma). It is associated with the hilly topography in the north-east of the site and extends some distance further north and east of this area. The rock unit is inferred to be approximately 2,000 m thick and primarily consists of sandstone with rhyolitic clasts and conglomerate and contains some shelly fossil deposits (Murray 1975).

**Table 7 Detailed surface geology of the site**

Rock unit name	Map symbol	Lithological summary	Dominant rock	Rock type	Time (years)	Site area (ha)
Qpa-QLD	Qpa	Clay, silt, sand and gravel; flood-plain alluvium on high terraces	Alluvium	Stratified unit (including volcanic and metamorphic)	10,000 – 140,000	227.223
Biloela formation	To	Freshwater, lacustrine mudstone, siltstone, oil shale and sandstone; minor lignite, carbonaceous mudstone and limestone.	Arenite-mudrock	Stratified unit (including volcanic and metamorphic)	≈ 25 Mya	1733.41
Pg/g? - YARROL/SCAG	Pg/g?	Granite, granodiorite	Granitoid	Intrusive unit	≈ 251 Mya	0.185
Smoky beds	Ps	Andesitic conglomerate and sandstone, mudstone, minor andesite lava	Mafites (lavas, clastics & high-level intrusives)	Stratified unit (including volcanic and metamorphic)	272 – 299 Mya	283.181
Balaclava formation	DCb	Rhyolitic volcanoclastic sandstone and conglomerate, minor ignimbrite, rare rhyolite, siltstone and oolitic limestone	Mixed sedimentary rocks and felsites	Stratified unit (including volcanic and metamorphic)	346 - 382 Ma	56.772





**LEGEND**

- Project area
- Index contour
- - - Intermediate contour
- Detailed surface geology
- Balaciava Formation (DCb)
- Biloela Formation (To)
- Pg/g?-YARROL/SCAG (Pg/g?)
- Qa-QLD (Qa)
- Qpa-QLD (Qpa)
- Smoky beds (Ps)
- Td-QLD (Td)
- Youlambie Conglomerate (CPY)

**Credits:**  
 Contours © State of Queensland (Department of Resources) 2021, Mountain peaks and capes - Queensland © State of Queensland (Department of Resources) 2021, Mountain ranges, beaches and sea passages - Queensland © State of Queensland (Department of Resources) 2021, Detailed surface geology - Queensland © State of Queensland (Department of Resources) 2021, Basins/ LatestStateProgram\_AllUsers © State of Queensland (Department of Resources), © Planet Labs Netherlands B.V., reproduced under licence from Planet and Geoplex, all rights reserved, 2022.

**Coordinate system: GDA94 / MGA zone 56 EPSG:28356**

**CLIENT: EDIFY ENERGY**

**FIGURE 3: GEOLOGICAL MAPPING**

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**Terra SOLUTIONS**

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DATE: 07/04/2022

AUTHOR: Anton



## 4.4 Soils

The Banana Land Resource Survey (Muller 2008) mapping identifies 15 separate soil profiles within the project area. Sodosols (i.e. soils with strong texture contrast between A horizons and sodic B horizons which are not strongly acid) and Vertisols (i.e. clay soils with shrink-swell properties that exhibit strong cracking when dry and at depth have slickensides and/or lenticular peds) are the dominant soil orders occupying approximately 971.53 ha (43%) and 861.81 ha (38%) of the project area respectively. The cracking clays on the site are diverse with six different profiles categorised whilst only three sodic profiles are mapped.

Vertisols within the project area are categorised as moderately well drained soils that are high in exchangeable calcium or strongly sodic with a highly saline subsoil (Muller 2008). Both types are common on the site, however the Vertosols that formed from unconsolidated Cainozoic alluvial-colluvial sediments possess the saline subsoil which typically form gilgai mounds and depressions which primarily occur in the western extent of the project area. They are presented spatially in Figure 4 and described below:

- Earlsfield is found throughout the Callide Valley and commonly on the clay sheets to the north and west of Banana. Earlsfield soils are very deep cracking clays with occasionally widely spaced melonhole that range in size from 10 – 15 m horizontally and 0.3 – 0.5 m deep.
- Greycliffe soils are deep cracking clays with widely spaced melonhole gilgai. Gilgai sizes range in size from 10 – 30 m horizontally and 0.1 – 0.2 m deep. These gilgai are poorly drained with very slow runoff but are shallow and therefore support water for shorter periods. Soils on the mounds are strongly sodic with very high salt content.
- Greycliffe - melonhole phase soils are very deep cracking clays with strongly developed melonhole gilgai. Gilgai range in size from 20 – 60 m horizontally and 0.5 – 1.6 m deep. These gilgai are poorly drained with a very slow runoff and due to their size and depth contain water for long periods. Soils on the mounds are strongly sodic with very high salt content.

Typically for gilgai clay soils, the phosphorous content of the mound is lower than for the depression as topsoil erodes from the mounds into the depression. This exposes the saline subsurface soils which in turn favours salt-tolerant species which were commonly observed on gilgai mounds. This process is accelerated exacerbated through the clearing of brigalow and disturbance of surface soils by cattle.

Sodic duplex soils on the site coincide with unconsolidated Cainozoic alluvial- colluvial sediments in the geological mapping. This soil type consists of sands and loams overlying a sodic clay subsoil of which three profiles are mapped on the site.

- Kokotungo is one of the most extensive soils in the Banana Land Resource Survey and is also the most extensive soil profile in this project area (940.11 ha). Kokotungo has a clay loamy topsoil with a strongly sodic subsoil that is highly dispersive.
- The Desdemona soil occurs in only a few small areas on the extensive colluvial plains to the north-east of Goovigen. Desdemona has a sandy topsoil with a sodic subsoil which is less prone to dispersal than Kokotungo.
- Ulogie often occurs near Tertiary sandstone plateaus. It has a sandy loam to clay loam topsoil with a dense and strongly sodic subsoil that is highly dispersive and erodible.

Detailed soil information for each the profiles mapped in the study are presented in Table 8 and the mapping is presented in Figure 4.

Table 8 Soil concepts present within the project area (from Muller 2008)

Soil profile class	Dominant soil order	Landform	Parent material	Description	Area
<b>Sand or loam over friable or earthy clay</b>					
Thalberg (Tb)	Chromosol - Brown	Undulating rises to level plains	Unconsolidated Cainozoic alluvial colluvial sediments	Thalberg is a hard setting, very deep (>1.5 m), brown or red, duplex soil, with a 0.2 to 0.5 m thick, fine sandy clay loam or clay loam fine sandy topsoil, that occasionally has a pale or sporadically bleached A2 horizon. The topsoil overlies a prismatic or blocky structured, fine sandy light medium or medium clay subsoil that has a neutral or alkaline soil reaction trend. Thalberg is formed on Cainozoic, alluvial-colluvial sediments.	0.03
Bluff (Bf)	Kurosol - Red	Steep escarpments	Deeply weathered Tertiary sedimentary rocks	Bluff is a moderately deep to deep (0.5-1.2 m), red, brown or grey, strongly acid duplex soil, with a stony, sandy loam to clay loam topsoil, 0.1 to 0.35 m thick, overlying a strongly acid, sometimes mottled, medium clay subsoil. Bluff has an acid soil reaction trend and is formed on deeply weathered, Tertiary, sedimentary rocks.	91.33
<b>Total</b>					<b>91.36</b>
<b>Friable non-cracking clay or clay loam soils - Dermosols, Ferrosols</b>					
Santo, fertile phase (SnFp)	Dermosol - Red	Undulating low hills to gently undulating rises	Permian and Devonian intermediate volcanic rocks	Santo fertile phase is shallow or moderately deep (0.3 to 0.9 m), structured, red or brown, non-cracking clay with a moderately thick (0.1 to 0.2 m), light clay or light medium clay topsoil that overlies a blocky structured, light clay to medium clay subsoil. Santo fertile phase has a neutral or alkaline soil reaction trend and is formed on Permian, intermediate, volcanic rocks.	58.64
Santo, stony phase (SnSp)	Dermosol - Red	Dissected rolling low hills to rolling rises	Permian and Devonian intermediate volcanic rocks	Santo stony phase is a shallow to moderately deep (0.2-0.8 m), stony, red or brown, uniform or gradational soil with a 0.05 to 0.25 m thick, clay loam fine sandy to light medium clay topsoil that overlies a blocky structured light clay to medium clay subsoil. Santo stony phase has a neutral to alkaline soil reaction trend and is formed on Permian, intermediate, volcanic rocks.	65.17

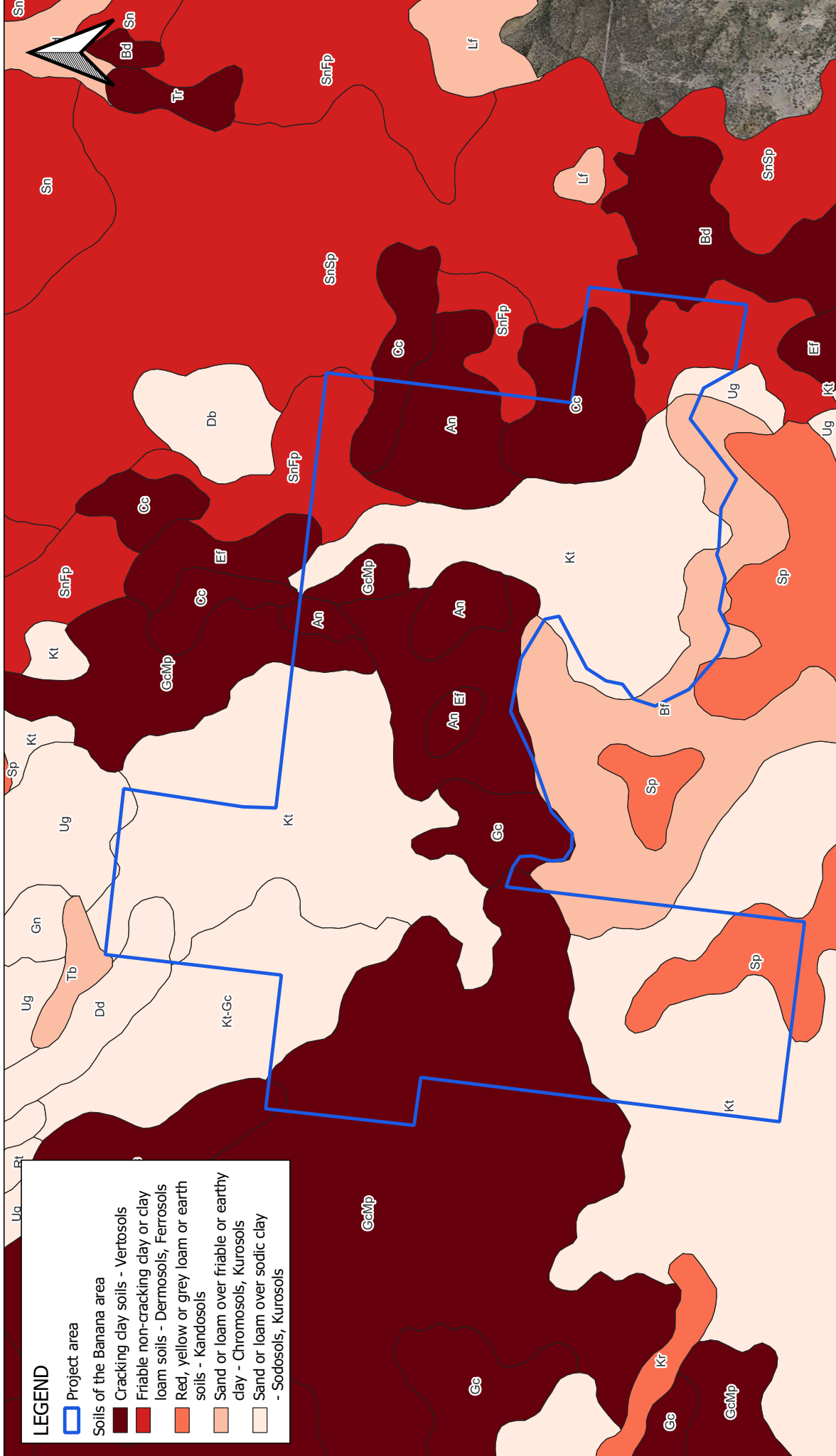
**REPORT**

Soil profile class	Dominant soil order	Landform	Parent material	Description	Area
<b>Total</b>					<b>123.81</b>
<b>Red, yellow or grey loam or earth soils - Kandosols</b>					
Spier (Sp)	Kandosol - Red	Level to undulating plateau surfaces	Deeply weathered Tertiary sedimentary rocks	Spier is a deep to very deep (1.1->1.5 m), massive, red gradational soil with a fine sandy loam to clay loam topsoil that grades into a clay loam fine sandy to fine sandy light medium clay subsoil. Spier is formed on Tertiary sandstone and has a neutral or acid soil reaction trend.	73.03
<b>Total</b>					<b>73.03</b>
<b>Sand or loam over sodic clay - Sodosols, Kurosols</b>					
Desdemona (Dd)	Sodosol - Brown	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Desdemona is a very deep (>1.5 m), brown, sodic duplex soil with a thick or very thick (0.4-0.9 m), sandy topsoil that has a sporadically bleached A2 horizon. The topsoil overlies a brown, sometimes mottled, fine sandy light or light medium clay subsoil with a coarse prismatic structure. Desdemona has a neutral soil reaction trend and is formed on unconsolidated Cainozoic alluvial-colluvial sediments.	19.01
Kokotungo (Kt)	Sodosol - Brown	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Kokotungo is a very deep (>1.5 m), brown or grey, sodic duplex soil with a moderately thick to thick (0.1-0.5 m), clay loamy topsoil that has a sporadically bleached A2 horizon, that overlies a light medium of medium clay, prismatic structured subsoil. Kokotungo has mainly an alkaline soil reaction trend.	940.11

Soil profile class	Dominant soil order	Landform	Parent material	Description	Area
Ulogie (Ug)	Sodosol - Brown	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Ulogie is a very deep (>1.5 m), brown or grey, strongly sodic, duplex soil with a moderately thick to thick (0.15-0.5 m), fine sandy loam to clay loam sandy topsoil that has a sporadically bleached A2 horizon. The topsoil overlies a coarse columnar structured, fine sandy light medium or medium clay subsoil that is sometimes mottled. Ulogie has variable subsoil pH so that the soil reaction trend is equally acid, neutral or alkaline, and is formed on Cainozoic, alluvial-colluvial sediments.	12.41
<b>Total</b>					<b>971.53</b>
<b>Cracking clay soils - Vertosols</b>					
Annandale (An)	Vertisol - Black	Gently undulating plains and rises	Tertiary basalt	Annandale is a moderately deep (0.4-0.85 m), black, fine to coarse self-mulching, strongly cracking clay soil that is formed on basalt. Weakly developed normal gilgai can be present on the deeper profiles.	164.78
Beldeeen (Bd)	Vertisol - Black	Undulating low hills to gently undulating rises	Permian and Devonian intermediate volcanic rocks	Beldeeen is a moderately deep to very deep (0.7->1.5 m), black, cracking clay soil formed on Permian volcanic rocks. It usually has well developed linear gilgai that have fine self-mulching mounds, with pedat or coarse self-mulching topsoils in the depressions.	7.76
Clancy (Cc)	Vertisol - Black	Gently undulating plains and rises	Tertiary basalt	Clancy is a shallow to moderately deep (0.3-0.9 m), black, very coarse self-mulching, strongly cracking clay soil with an alkaline soil reaction trend that is formed on basalt.	114.35
Earlsfield (Ef)	Vertisol - Black	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Earlsfield is a very deep (>1.5m), black, dark brown or grey, cracking clay soil with a very fine self-mulching topsoil. The subsoil is strongly sodic (ESP>15), with high levels of soluble salts (EC >0.8 dS/m) below 0.8m. It has a predominantly acid soil reaction trend and is formed on unconsolidated, alluvial-colluvial sediments.	153.01



Soil profile class	Dominant soil order	Landform	Parent material	Description	Area
Greycliffe, melonhole phase (GcMp)	Vertisol - Grey	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Greycliffe melonhole phase is a very deep (>1.5 m), grey cracking clay with well-developed melonhole gilgai. It is strongly sodic (ESP >15) with high levels of soluble salts (EC1:5 >0.8dS/m) in the upper 0.3 to 0.5 m of the subsoil and has mainly an acid soil reaction trend.	353.01
Greycliffe (Gc)	Vertisol - Grey	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Greycliffe is a very deep (>1.5 m), grey or brown cracking clay soil with a pedal to coarse self-mulching topsoil and an acid soil reaction trend. The upper subsoil is strongly sodic (ESP >15), and has high to very high levels of soluble salts (0.8 to 2.5 dS/m). Greycliffe has widely spaced, melonhole gilgai separated by inter-gilgai flats up to 50 m in width.	68.9
<b>Total</b>					<b>861.81</b>
<b>Complex of sand or loam over sodic clay with cracking clay soils</b>					
Kokotungo-Greycliffe complex (Kt-Gc)	Sodosol - Brown and Vertisol - Grey complex	Undulating rises to level plains	Unconsolidated Cainozoic alluvial-colluvial sediments	Refer to Kokotungo and Greycliffe above.	118.37
<b>Total</b>					<b>118.37</b>



**LEGEND**

- Project area
- Soils of the Banana area
- Cracking clay soils - Vertosols
- Friable non-cracking clay or clay loam soils - Dermosols, Ferrosols
- Red, yellow or grey loam or earth soils - Kandosols
- Sand or loam over friable or earthy clay - Chromosols, Kurosols
- Sand or loam over sodic clay - Sodosols, Kurosols

Credits:  
 Soils - soils of the Banana area central Queensland - BAN © State of Queensland (Department of Environment and Science) 2020, Includes material © State of Queensland (Department of Resources); © Planet Labs Netherlands B.V. reproduced under licence from Planet and Geoplex, all rights reserved, 2022.

Coordinate system: GDA94 / MGA zone 56 EPSG:28356

**CLIENT: EDIFY ENERGY**

**FIGURE 4: SOILS OF THE BANANA AREA**

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DATE: 07/04/2022

AUTHOR: Anton

## 4.5 Land use

Land use in the project area is predominantly beef cattle fattening and breeding on introduced pastures. Progressive land clearing is evident in aerial imagery from the early 1950's and probably earlier as substantial clearing can be seen in the earliest aerial photography of the area.

Significant soil preparation has been undertaken in past years to improve the success of sowed pastures. The process of soil preparation has included mechanical tilling and/or blading to at least 60 cm in depth (pers comm. Maynard 2022). This has been undertaken at least twice in gilgai lands to enable water penetration. It is noted that gilgai will reform over time, but these works have likely impacted underground habitats for subterranean species.

Pastures were tall and dense at the time of the survey and mostly consisted of a monoculture of sabi grass (*Urochloa mosambiquensis*).

## 4.6 Wetlands and watercourses

The site is located within the Dawson River sub-basin which is in the Fitzroy basin of the Northeast Coast drainage division of Queensland (Figure 5).

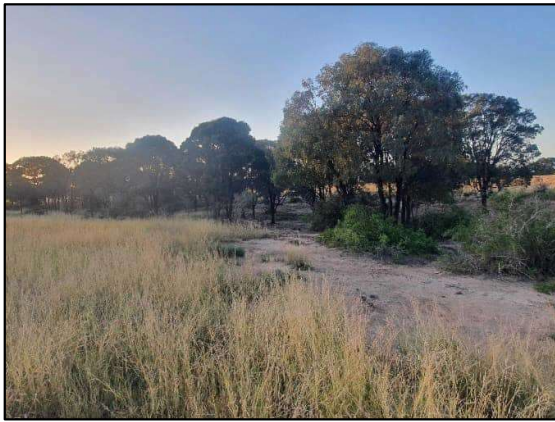
Drainage from the site is variable but in general terms the direction of watercourse is the following:

- The southern extent of Lot 39 is drained by one of the large watercourses in the project area and its smaller tributaries (Plate 2a) following a westerly path toward a large dam north of Dooney Smooth Road. The central part of Lot 39 also drains west but slightly downstream of the dam and flows into a long linear billabong associated with Callide Creek (Lake Victoria).
- Water from Lot 18, Lot 28, most of Lot 29 and the western half of Lot 37 drain in a northwest direction (Plate 2b) and eventually combine with the Don River approximately 6.5 km from the site. Water from Lot 32, Lot 33, and most of the eastern half of Lot 37 drain north (Plate 2c) combining with the Don River further upstream approximately 6.5 km north of the site.
- The eastern half of Lot 37 is the only area which drains in a southerly direction. Watercourses and drainage lines in this area ultimately join Gerard Creek, approximately 4.5 km south-southeast of the site.

All watercourses on the site are small (Strahler Order one or two) and classified as ephemeral systems with intermittent flashy flow regimes. The direction and quantity of flow off the site are affected by numerous in-stream dams which have been constructed for agricultural purposes. It is believed that the dams provide a year-round water supply except in drought years. Several earthen dams constructed on sodic soils are in relatively poor condition with banks having substantial rill erosion, but all contained water at the time of this survey.

Non-fluvial flows in the western half of the project area have produced gilgai wetlands of various sizes in the west of the project area. These small wetlands range in ephemerality with some of the smaller water bodies found to be dry during the survey.





2a Watercourse in south-west of Lot 39 draining south-west



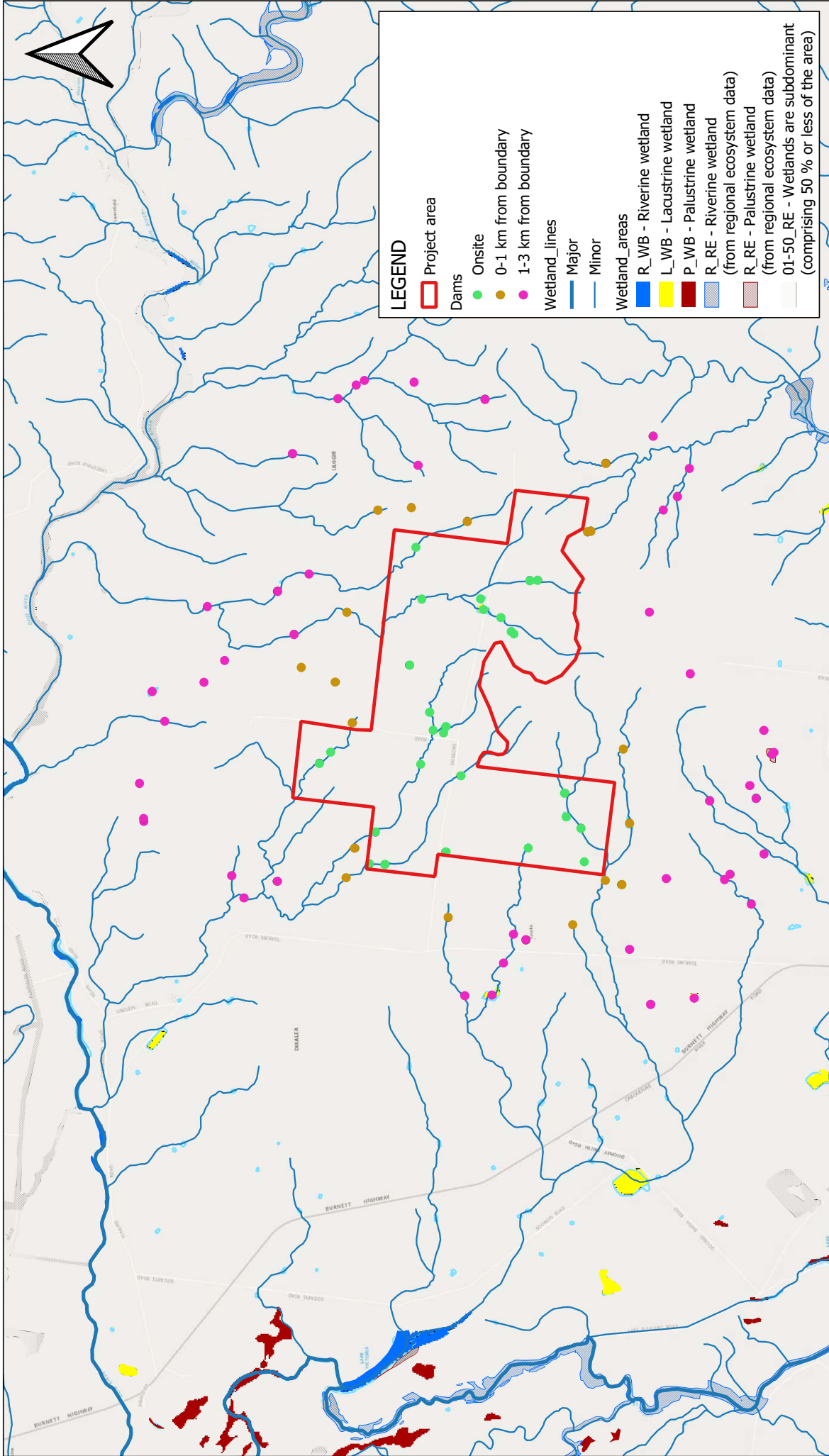
2b Watercourse in the north of Lot 18 draining northwest



2c Watercourse in the north of Lot 29 draining north

**Plate 2 Project area watercourses**





**Credits:**

Derived from Watercourse lines - Queensland © State of Queensland (Department of Resources) 2021, Wetland data - version 5 - wetland lines - Queensland © State of Queensland (Department of Environment and Science) 2020, Wetland data - version 5 - wetland areas - Queensland © State of Queensland (Department of Environment and Science) 2020, Queensland basemap colour web service © State of Queensland (Department of Resources) 2021

Coordinate system: GDA94 / MGA zone 56 EPSG:28356

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**FIGURE 5: WATER RESOURCES**



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AUTHOR: Anton

DATE: 07/04/2022

## 4.7 Vegetation communities

The EPBC Act protected matter search returned five threatened ecological communities listed under the EPBC Act in the search area, namely:

- Coolibah - black box woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions
- Poplar box grassy woodland on alluvial plains
- Weeping myall woodlands
- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions

The poplar box grassy woodland TEC was not previously returned during PMST searches undertaken by RPS (2018) as the community was listed in 2019. This community has the potential to occur in the local area however it was not identified during site surveys and does not occur in the project area.

Field investigations confirmed the presence of the Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC within the project area as described in Section 4.7.3.

Six vegetation communities were verified in the project area during the field investigations as described in the following sections. Photographs of the communities are provided along with the spatial extent of each community in Table 8 and Figure 6.

**Table 9 Vegetation community extent within the project area**

Community	Extent in project area	% in project area
<i>Urochloa mozambiquensis</i> grassland	1947.6	85.2
Gilgai depressions and rises	220.8	9.7
<i>Acacia harpophylla</i> woodland and fringing woodlands	78.7	3.4
<i>Eucalyptus crebra</i> woodland	12.3	0.5
<i>Eucalyptus cambageana</i> woodland	11.5	0.5
<i>Acacia rhodoxylun</i> woodland	10.8	0.5
<i>Casuarina christata</i> woodland	3.0	0.1

### 4.7.1 Exotic pastures

The dominant vegetation community within the project area is the sabi grass (*Urochloa mosambiquensis*) pastureland which occupies approximately 1,967.60 ha of the site (Plate 3). The community contains some isolated trees and occasional shrubby areas and occurs over all the dominant soil orders (i.e. kurosols, dermosols, kandosols, sodosols and vertosols). Isolated trees within the pasturelands include brigalow (*Acacia harpophylla*), Dawson's gum (*Eucalyptus cambageana*), mountain coolabah (*Eucalyptus orgadophila*), coolabah (*Eucalyptus coolabah*) and Queensland bottle tree (*Brachychiton rupestris*). Where isolated shrubs are present they are species that typically grow in brigalow communities such as scrub wilga (*Geijera parviflora*), Queensland ebony (*Diospyros humilis*), currant bush (*Carissa ovata*), various canthiums (*Psyrax* spp) and holly bush (*Alectryon diversifolius*).

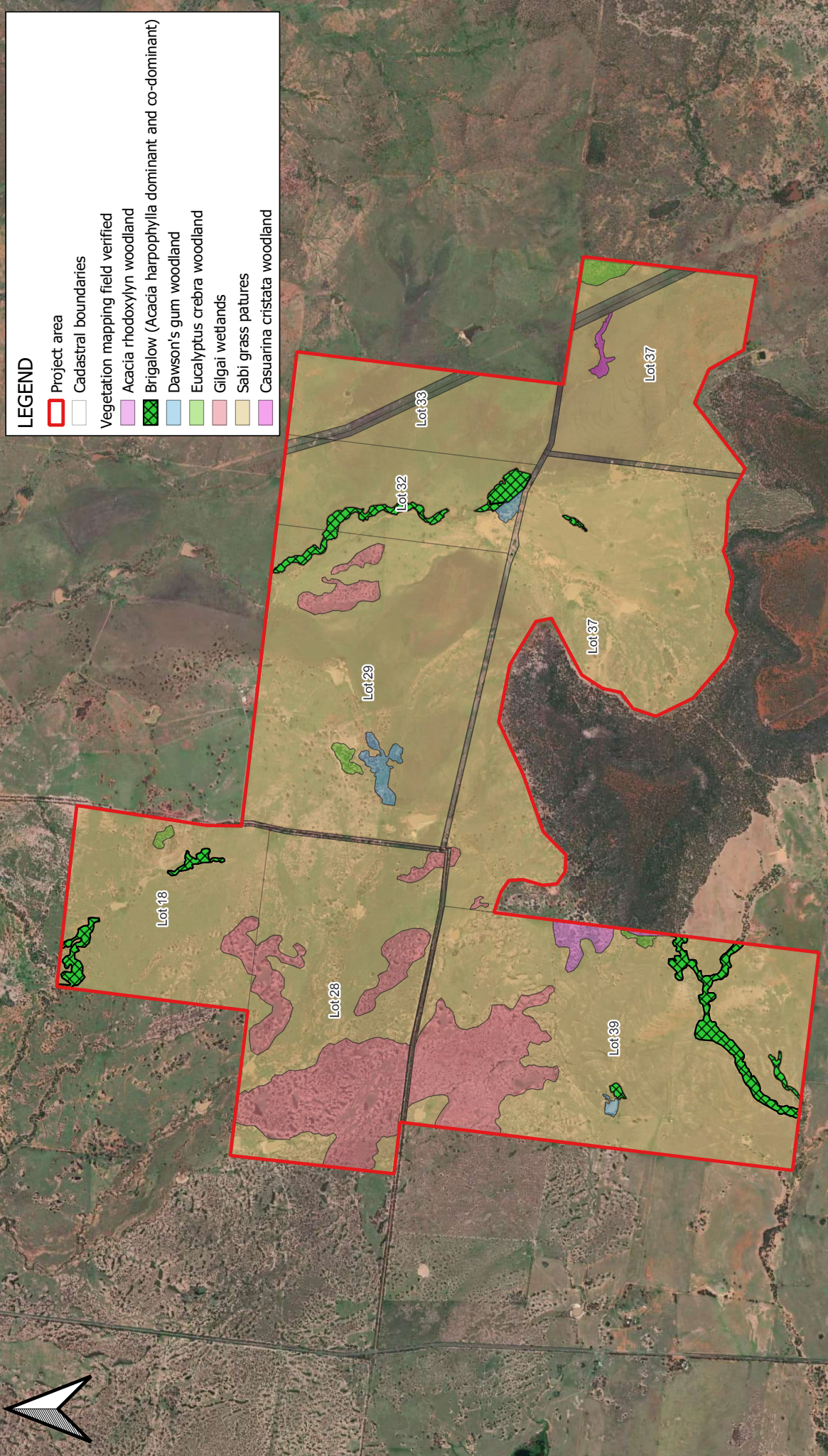
The grass cover consists of a thick monoculture of sabi grass with occasional small patches of guinea grass (*Megathyrsus maximus*), buffel grass (*Cenchrus ciliaris*), Indian bluegrass (*Bothriochloa pertusa*) or black speargrass (*Heteropogon contortus*). Native grasses were very uncommon in the pastures and a diverse range of seeds for granivorous species such as squatter pigeon was not present.

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There were few areas of bare ground in this community but stony rises, beneath trees and around dams lacked cover. The bare areas on stony rises are considered natural whilst the areas around dams are the result of the disturbance and compaction of surface soils by cattle. The stocking regime and season therefore influences the density of the herb layer at these sites.

Prior to vegetation clearing (i.e. before the 1950's) the vegetation across the site was probably a brigalow – Dawson's gum woodland to open forest. Remnants of these communities have been retained or have regrown along the adjacent road corridors.





**LEGEND**

- Project area
- Cadastral boundaries
- Vegetation mapping field verified
- Acacia rhodoxlym woodland
- Brigalow (Acacia harpophylla dominant and co-dominant)
- Dawson's gum woodland
- Eucalyptus crebra woodland
- Gilgai wetlands
- Sabi grass pastures
- Casuarina cristata woodland

Credits:  
 Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,  
 USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate system: GDA94 / MGA zone 56 EPSG:28356

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FIGURE 6: FIELD VERIFIED VEGETATION



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DATE: 07/06/2023 AUTHOR: Anton





**Plate 3 Pasture grasslands**

#### 4.7.2 Gilgai depressions and rises

Cleared gilgai lands occupy of approximately 220 ha of the project area and represent a variation of the cleared pasture lands due to the soil type and landform. There is a distinct aquatic vegetation community within the depressions and although the rises are still typically dominated by sabi grass there is a greater diversity of salt-tolerant flora species on the mounds and inter-gilgai flats (Plate 4).

Approximately half of the gilgai depressions contained water to approximately 50 cm deep and supported a dense layer of aquatic plants which typically exceeded 70% cover. The plants included various *Cyperus* spp., velvet knotweed (*Persicaria attenuata*), sourgrass (*Paspalum conjugatum*), *Caldesia oligococca*, Nardoo (*Marsilea drummondii*), blue hyacinth (*Monocoria cyanea*), rice sedge (*Cyprus difformis*), round-leaf cassia *Chaemacrista rotundifolia*, *Eliocaris* sp, slender canegrass (*Dinebra decipiens*) and *Aponogeton queenslandicus*.

The gilgai mounds and inter-gilgai flats contained a mid-dense cover of sabi grass with a range of salt-tolerant species such as lagoon saltbush (*Atriplex muelleri*), roly-poly (*Salsola australis*), ruby salt bush (*Enchylaena tomentosa*), currant bush and Australian dropseed (*Sporobolus australasicus*). This ground layer is sparser than other areas of the site due to the subsurface saline soils which are exposed during the formation of gilgai landforms in the area.





**Plate 4 Cleared gilgai wetlands and rises**

### 4.7.3 Brigalow (*Acacia harpophylla* dominant and co-dominant) woodlands

Brigalow (*Acacia harpophylla* dominant and co-dominant) woodlands TEC occupy approximately 78.7 ha of the project area. These woodlands are mostly located along watercourses where riparian vegetation has been retained during clearing and a few small, isolated patches elsewhere. The major areas of the TEC are located on the larger watercourses on Lot 32 / Lot 29 (approx. 10 ha) and Lot 39 (approx. 17 ha).



In the northern parts of Lot 32 / Lot 29 riparian vegetation of the main watercourse consists of a brigalow and belah (*Casuarina cristata*) woodland some vine thicket elements including broad-leaved bottle tree (*Brachychiton australis*), Queensland ebony (*Lysiphyllum hookeri*), scrub ironbark (*Acacia fasciculifera*), bitterbark (*Alstonia constricta*), wild prune (*Sersalisia sericea*) and scrub wilga (*Geijera parviflora*). The ground layer is dominated by a dense layer of sabi grass and Guinea grass, spiked mallow (*Malvastrum americanum*) and occasionally currant bush as a low shrub (Plate 5a).

The watercourse cuts through the highly dispersive Kokotungo (Kt) sodosols and the vegetation appears to stabilise the watercourse banks (Plate 5b). A larger patch of this community also occurs in the south of Lot 32 but there is a distinct mid-dense secondary tree layer dominated by scrub wilga and sandalwood (*Santalum lanceolatum*) and mixed shrub-layer of holly bush, wild prune, blush boxwood (*Elaeodendron australe*), hairy acalypha (*Acalypha nemorum*) and weeping koda. The ground layer has been disturbed by hooved animals and is now dominated by Guinea grass, Devil's horsewhip (*Achyranthes aspera*), currant bush (*Carissa ovata*) and Harrisia cactus (*Harrisia* sp) among other introduced species (Plate 5c). This ecosystem was the only vegetation community observed in the project area with a medium – high density of course woody debris (Plate 5c and Plate 5d).

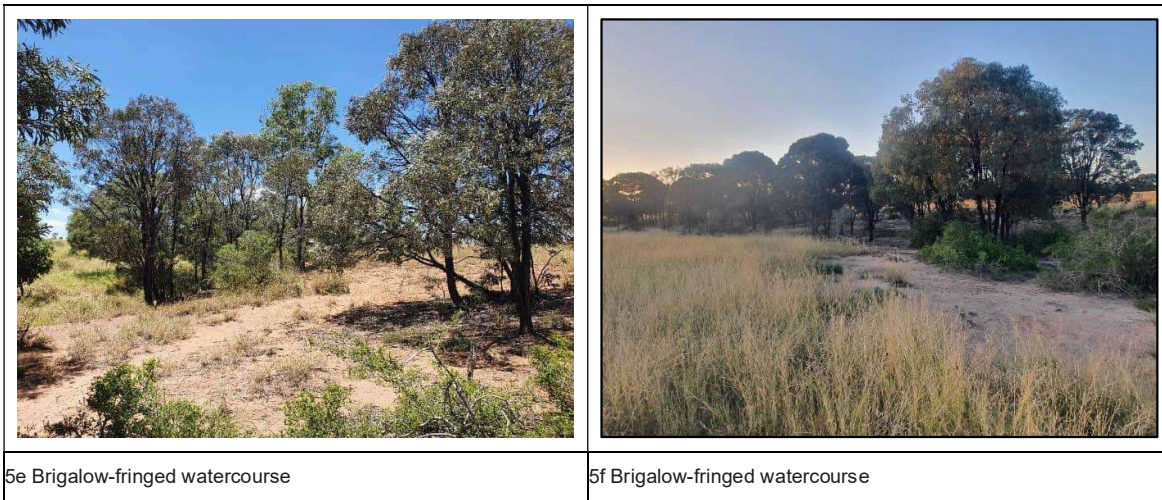


The watercourse traversing the southern extent of Lot 39 does not contain the vine thicket elements to the same extent and is described as a brigalow fringing open forest with Dawson’s gum, poplar box (*Eucalyptus populnea*) and Moreton Bay ash (*Corymbia tessellaris*). The shrub layer includes currant bush, weeping koda (*Ehretia membranifolia*), holly bush (*Alectryon diversifolius*) and bitterbark (*Alstonia constricta*). The ground layer includes Sabi grass, guinea grass, Australian dropseed, ruby salt bush, galvanised burr (*Sclerolaena birchii*), *Cissus* sp. The EPBC Act endangered species, *Solanum johnsonianum*, was recorded within this watercourse (Plate 5f).

A complete assessment of the diagnostic characteristics and condition thresholds was not undertaken to confirm classification as the Brigalow (*Acacia harpophylla* dominant and co-dominant) listed threatened ecological community under the EPBC Act (Figure 6) as the proponent will seek to avoid these woodlands. Consequently it is assumed that all brigalow woodlands identified are the TEC.

	
<p>5a Brigalow and belah riparian woodland</p>	<p>5b Gully erosion on Kokotungo (Kt) sodosols</p>
	
<p>5c Brigalow and belah with secondary tree and mixed shrubs</p>	<p>5d Coarse woody debris in Brigalow forest</p>





**Plate 5 Brigalow woodlands and fringing woodlands**

**4.7.4 Eucalyptus crebra woodlands and Eucalyptus cambageana woodlands**

An area of approximately 50 ha in the western area of lot 29 comprises two communities a narrow-leaved ironbark woodland (Plate 6a) and a Dawson’s gum woodland (Plate 6b). These communities are distinct but have a similar structure and locality. The canopy consists of narrow-leaved ironbark (*E. crebra*) or Dawson’s gum and Queensland bottle tree. The community includes a sparse to very sparse shrub layer of mostly currant bush, holly bush and nipan (*Capparis lasiantha*) and a sparse to dense monoculture of sabi grass in the ground layer. Other species observed in this community include crow’s ash (*Flindersia australis*).

Within these communities there was a clear patchiness of the ground cover driven by grazing intensity and the preferred shade areas used by cattle. This property had been destocked at the time of the survey and it seems a recovery of the grass density was underway.



**Plate 6 Narrow-leaved ironbark woodland and Dawson’s gum woodland**



#### 4.7.5 Casuarina christata woodlands

A woodland dominated by belah and containing Moreton Bay ash (*Corymbia tessellaris*), variable-barked bloodwood (*Corymbia erythrophloia*) and boonaree (*Alectryon oleifolius*) lines a small watercourse in the far eastern extent of Lot 37 (Plate 7). A secondary tree layer of emu apple (*Owenia acidula*) and boonaree occurs and the ground layer consists of a buffel grass. Like other vegetation on the site, this community lacks coarse woody debris. There is no brigalow in this community and therefore it is not the brigalow (*Acacia harpophylla* dominant and co-dominant) TEC.



Plate 7 Belah woodland

#### 4.7.6 Acacia rhodoxylon woodland

A small *Acacia rhodoxylon* woodland of approximately 10.84 ha is located approximately midway along the eastern boundary of Lot 39. The community occurs on the western side of an ironstone mesa among a thin layer of consolidated colluvium from the partially eroded mesa.

*Acacia rhodoxylon* is clearly the dominant canopy species with occasional *Flindersia australis* and *Alphitonia excelsa*. A sparse shrub layer consists of *C.ovata* and *A.constricta*. The ground layer is mid-dense to dense (exceeding 50% cover) but still dominated by *U.mozambiquensis* with occasional *M.maximus*.

### 4.8 Threatened flora

The PMST report returned 12 threatened flora species, 11 of which were previously assessed by RPS (2018). Two of these species, *Solanum dissectum* (Endangered under the EPBC Act) and *Solanum johnsonianum* (Endangered under the EPBC Act) were previously identified as having potential to occur on the site and were targeted in suitable habitat during this survey.

Black ironbox (*Eucalyptus raveretiana*) was not retrieved in the PMST report retrieved by RPS (2018). This is likely to reflect changes in the known distribution of the species as it was listed as Vulnerable under the EPBC Act prior to 2018. Suitable habitat for the species is not present on the site and field surveys confirmed the species absence. The closest area of potential habitat for black ironbox is most likely along the Don River and its larger tributaries which is located approximately 6 km north of the site.

#### 4.8.1 Solanum johnsonianum and Solanum dissectum

*S. johnsonianum* is an erect perennial sub-shrub growing 0.15 to 0.3 m high (Bean, 2004; Queensland Herbarium, 2012). The species regenerates from rhizomes beneath the soil surface and can flower and fruit rapidly in response to rain (Fensham et al 2019). The species is restricted to relatively small area with nine documented populations distributed over approximately 100 km, from north-west of Theodore to north of

Jambin (Bean, 2004; Queensland Herbarium, 2012). Fensham et al. (2019) estimated the extent of occurrence of *S. johnsonianum* to be 4,962 km<sup>2</sup> using confirmed herbarium records. *S. johnsonianum* is distributed within communities dominated or co-dominated by *Acacia harpophylla* (Brigalow), on heavy cracking soils. Associated species include *Eucalyptus thozetiana* with understorey of *Geijera parviflora* (Bean, 2004; Queensland Herbarium, 2012).

*S. dissectum* is an erect, perennial sub-shrub to a maximum height of 1 m (Department of Environment and Heritage Protection, 2021). The species regenerates from rhizomes beneath the soil surface and can flower and fruit rapidly in response to rain (Fensham et al 2019). The species has a small and restricted distribution in central Queensland, bounded by Banana, Dululu, Moura and Thangool although there are also records from an area approximately 40 km south of Blackwater (Queensland Herbarium 2012). Habitat is broadly described as open forest and woodland dominated by brigalow (*Acacia harpophylla*) and/or lapunyah (*Eucalyptus thozetiana*) on solodic clay soils (Queensland Herbarium 2012).

The preferred brigalow forest in which *S. dissectum* and *S. johnsonianum* occur typically possesses a dense tree canopy and a sparse ground layer of herbaceous vegetation where both species grow. Fensham et al (2019) in their extensive study on *S. adenophorum*, *S. dissectum*, *S. elachophyllum* and *S. johnsonianum* found that *S. dissectum* and *S. johnsonianum* did not persist in cleared brigalow habitat. They also found that the species does not occur in areas where exotic grass cover exceeds 40% and due to feedback mechanisms between exotic grasses, fire and canopy cover found that the species does not occur in areas with less than 50% canopy cover.

Based on the known habitat requirements targeted surveys for both *Solanum* spp. initially targeted brigalow habitats with some canopy cover and within these habitats targeted areas where exotic grass cover was less than 40%.

Targeted surveys successfully confirmed the presence of *Solanum johnsonianum* within the project area which occurred as an isolated population of 72 plants located in the southern extent of Lot 39 (Figure 7). Supporting habitat was a fringing riparian brigalow woodland and the population was found in dappled shade beneath a large tree in the upper bank of the watercourse. These plants were mostly in the vegetative phase of development although some larger individuals were only beginning to form buds but were readily identifiable as *Solanum johnsonianum*, which was subsequently confirmed by the Queensland Herbarium (Appendix C). The population occurred in one of the few habitats in the project area considered suitable for either *S. johnsonianum* or *S. dissectum* due to the following:

- No history of clearing
- A retained canopy providing shade to dappled soft light
- No history of mechanical disturbance (i.e. blading or tilling)
- Minimal encroachment from introduced pasture grasses (i.e. sabi grass).

Aside from the watercourse in which the population was found other watercourses and the site more broadly consisted of unsuitable habitat due to the density of sabi grass, the observed disturbance from pastoral activities and anecdotal information provided by landowners describing the cropping practices on the land such as surface blading of the soils. Notwithstanding, since this population was located within a watercourse with a retained brigalow canopy it should be excluded from development with adequate buffers to development applied to protect instream and riparian habitats. Conservatively, this measure could also be applied to other brigalow-lined watercourses even though exotic grasses dominate the ground layer of other watercourses.

## 4.9 Threatened fauna

The PMST report returned 26 threatened fauna species, four of which were not previously assessed by RPS (2018). The species being assessed here for the first time are:

- Coxen's Fig-Parrot (*Cyclopsitta diophthalma coxeni*) – EPBC Act listing of Endangered.
- Grey Falcon (*Falco hypoleucos*) – EPBC Act listing of Vulnerable.

- White-throated Needletail (*Hirundapus caudacutus*) – EPBC Act listing of Vulnerable.
- Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*) – EPBC Act listing of Vulnerable.

Coxen's fig parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest (Coxen's Fig-Parrot Recovery Team 2001; Holmes 1990; Templeton 1992). These habitats are not present in the project area and consequently the species is considered unlikely to occur.

Grey falcon is essentially confined to the arid and semi-arid zones where rainfall is less than 500 mm per annum (Schoenjahn 2018). The species is generally absent in areas east of the great dividing range in Queensland (Barrett et al. 2003; Schoenjahn 2018), aside from the occasional vagrant animal. Preferred habitat consists of timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses (Garrett et al. 2011; Schoenjahn 2013, 2018; Janse et al. 2015; Ley and Tynan 2016). The site is located to the east of the Great Dividing Range and receives a mean annual rainfall of 630.1 mm with only a 10% chance of receiving less than 500 mm in any given year. The species is therefore unlikely to occur within the project area.

White-throated needletail is a primarily aerial species that occupies airspace over forests, woodlands, farmlands, plains, lakes, coasts and towns (Pizzey and Knight 2010) and frequently forages over hilltops and timbered areas (DAWE 2022a). The species is widespread over eastern and south-eastern Australia and owing to its mobility can utilise the aerial space over almost any habitat including developed areas. Therefore this species has the potential to forage over the project area but is unlikely to be affected by the proposed action.

Yellow-bellied glider (south-eastern) occurs at altitudes from sea level to 1,400 m above sea level and has a widespread, patchy distribution along the eastern ranges of Queensland and NSW to eastern and southern Victoria and across to the far south-east of South Australia. Preferred habitat includes eucalypt dominated woodland and forests and forests, including wet and dry sclerophyll forests (Kavanagh et al. 1995; Rees et al. 2007). The species requires large tracts of forests to maintain sub-population viability because the trees used as foraging substrates are dispersed and use of trees can vary through time and space (Woinarski et al. 2014). No areas of suitable habitat occur in the project area as patches of vegetation are too small and disconnected and do not contain recognised sap trees utilised by the species. Consequently the subspecies is unlikely to occur.

#### 4.9.1 Ornamental snake habitat assessment and survey

The natural habitat of ornamental snake consists of woodland or open forest associated with moist areas, especially gilgai (melon-hole) mounds and depressions and an abundance of frogs.

Associated vegetation includes communities dominated by brigalow (*Acacia harpophylla*), gidgee (*Acacia cambagei*), Blackwood (*Acacia argyrodendron*) or Coolibah (*Eucalyptus coolabah*); however the species has been recorded in a paddock dominated by buffel grass (*Cenchrus ciliaris*) about one kilometre from a gilgaied patch of Brigalow regrowth, during drought (Agnew 2010 pers. comm.).

Sites where Ornamental Snakes have been recorded in abundance share the following habitat characteristics (Agnew pers. comm 2010 cited in DAWE 2022):

- Contains shallow water with aquatic vegetation or inundated fringing groundcover. Especially occurs in flooded gilgais where the dominant aquatic macrophyte is bog hyacinth.
- Contains a range of gilgai sizes and depths although deep gilgai should be broad with gently sloping banks.
- Soils possess a high clay content, deep cracking characteristics and high water retention.
- Ground timber is common.
- Frogs are abundant, particularly *Cyclorana* spp.
- Habitats typically exceed 10 hectares in area and are within, or connected, to larger areas of remnant vegetation.

- Refuge habitat for use during dry periods is present. Typically this habitat is deep cracking clay on gilgai mounds.

The area of *Acacia harpophylla* woodland with SEVT understorey on Lot 32 provides poor quality habitat for ornamental snake as surface soils consist of a self-mulching clay with no evidence of deep cracks or gilgai formation. The patch is small (5.12 ha) and has no connectivity with large patches of remnant vegetation. Consequently species persistence in this area is considered unlikely.

The majority of gilgais are in the west of the site and form part of an extensive complex of around 2,100 ha extending to the west of which 220 ha (10.5%) occurs in the project area. The larger gilgai complex contains a 310-ha patch of brigalow which is located approximately 2.7 km from the site. Another area of cleared gilgai approximately of 14 ha is located on Lot 29 but has no connectivity with other gilgai landforms or remnant vegetation.

Assessment of the onsite gilgai confirmed the presence of several attributes associated with ornamental snake habitat:

- The gilgai mounds and depressions range in size from approximately 10 m<sup>2</sup> to almost 0.5 ha and all had gently sloping sides.
- The larger depressions contained water (approximately half of all gilgai) up to 0.6 m deep and contained a diversity of aquatic plants including the indicator species *Monochoria cyanea* (refer Section 4.7.2).
- The soils present in the gilgai mounds were self-mulching at the surface with a deeply cracking subsoil providing potential refugial habitat for the species.
- Several known prey items were confirmed to occur including a high abundance of striped burrowing frog (*Cyclorana alboguttata*) along with lower abundances of eastern snapping frog (*Cyclorana novaehollandiae*), eastern dwarf tree frog (*Litoria fallax*), bumpy rocket frog (*Litoria inermis*), striped rocket frog (*Litoria nasuta*), ruddy tree frog (*Litoria rubella*) and green tree frog (*Litoria caerulea*).

Targeted surveys from 7<sup>th</sup> to 11<sup>th</sup> February 2022 did not detect any ornamental snakes, however five ornamental snakes were detected within the project area during surveys from 13<sup>th</sup> to 16<sup>th</sup> February 2023. The recorded locations are presented in Figure 7.

## Squatter pigeon habitat assessment and survey

Three squatter pigeons and 54 ha of breeding and foraging habitat were identified over the course of the habitat assessment and targeted survey. All identified birds were located on Lot 39 and confirmed during either waterbody survey or active search. Slow driving transects along farm tracks failed to yield any individuals despite being a highly successful survey method at other sites.

Squatter pigeon habitat consists of remnant or regrowth open forest to woodland communities with a patchy, tussock grass understorey on well-draining, gravelly, sandy or loamy soils with that support the subspecies' breeding and foraging requirements (Squatter pigeon workshop 2011). Their foraging habitat occurs in communities dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species and within 3 km of a permanent or seasonal waterbody (Squatter pigeon workshop 2011). The species prefers to forage (and dust bathe) on bare ground under an open canopy of trees where the ground layer is patchy and cover rarely exceeds 33% of the ground area (Squatter pigeon workshop 2011). Breeding habitat on stony rises within 1 km of a suitable water resource where the subspecies nests in shallow depressions, thus requiring well-draining soils (Squatter pigeon workshop 2011).

Several areas of suitable foraging habitat for squatter pigeon (southern) were identified during the habitat assessment (Figure 7). These areas consisted of woodland to open woodlands dominated by either brigalow, Dawson's gum or narrow leaved ironbark with a patchy ground layer of native grasses and forbs. All suitable foraging habitats identified in the project area occurred on either Kandosols, Chromosols, Kurosols or Sodosols and contained a sandy or stony surface layer (refer Figure 4 for soil types). The foraging habitat was found to be limited by the extensive areas of unsuitable clay soils and the lack of suitable woodland and forest communities remaining on the suitable sandy and gravelly substrate. A further limiting factor at sites that would otherwise be suitable is the lack of native tussock grasses which had been



replaced by a monoculture of sabi grass at most sites. An assessment of water resources confirmed that the entire site is within 3 km of a suitable hydration point and therefore access to water is unlikely to be a factor that limits squatter pigeon presence on the site.

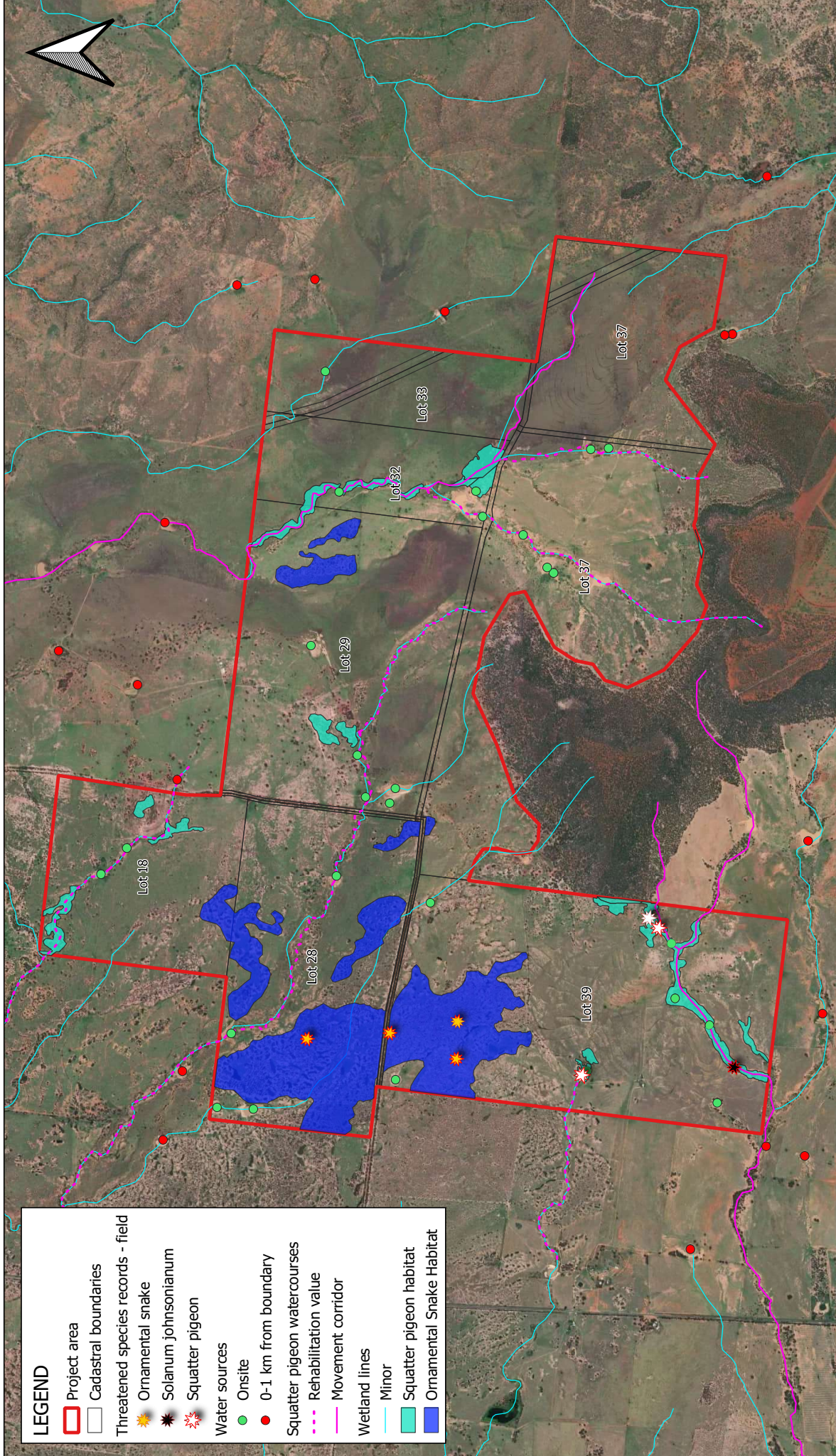
Two potential areas of breeding habitat were identified within the project area (Figure 7). The first area was in a narrow-leaved ironbark woodland located immediately adjacent to the eastern boundary of Lot 18. This community is approximately 1.6 ha in area with dams located 170 m to the south-east and 500 m to the north-west. The second area is located on the eastern boundary of Lot 39 in an area where three vegetation communities converge (i.e. narrow-leaved ironbark woodland, rosewood woodland and brigalow woodland). These areas are all located on stony colluvium which have washed down from the adjacent ironstone jump-up to the east. A dam is located approximately 350 m west south-west of the habitat and is connected to the site by a narrow, brigalow-fringed watercourse. Surveys in this area confirmed the presence of two squatter pigeons which were flushed from the ground and flew south-west along the watercourse. No other suitable squatter pigeon breeding habitat was identified in the project area.

Dispersal habitat for the squatter pigeon consists of forest or woodland between patches of foraging or breeding habitat and suitable waterbodies. Suitable water resources for squatter pigeon occur within the project area and primarily take the form of constructed in-stream dams. There are also numerous other dams located within 3 km the project area and in the same watercourses that flow through the project area (Figure 7). Squatter pigeon would therefore primarily utilise watercourse corridors for movement particularly those with wooded riparian areas. The most important of these watercourses from a dispersal perspective are presented in Figure 7.



**LEGEND**

- ▭ Project area
- Cadastral boundaries
- Threatened species records - field
- ★ Ornamental snake
- ★ Solanum johnsonianum
- ★ Squatter pigeon
- Water sources
- Onsite
- 0-1 km from boundary
- Squatter pigeon watercourses
- Rehabilitation value
- Movement corridor
- Wetland lines
- Minor
- Squatter pigeon habitat
- Ornamental Snake Habitat



**Credits:**  
 Derived from Watercourse lines - Queensland © State of Queensland (Department of Resources) 2021, Wetland data - version 5 - wetland lines - Queensland © State of Queensland (Department of Environment and Science) 2020, Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**CLIENT: EDIFY ENERGY**

**FIGURE 7: THREATENED SPECIES HABITAT MAPPING**

0 1 2 3 4 5 km

1:28,000

DOCUMENT: E:\Terra Solutions\Projects\PROJECTS -

DATE: 09/03/2023

AUTHOR: AF



## 4.10 Migratory fauna

The PMST report returned 15 migratory fauna species, two of which were not assessed by RPS (2018). The species being assessed here for the first time are:

- Fork-tailed swift (*Apus pacificus*)
- Estuarine crocodile (*Crocodylus porosus*)

The fork-tailed swift is a non-breeding migrant from Asia to all states and territories of Australia (Higgins 1999). The species is found across a range of habitats, from inland plains to wooded areas, where it is exclusively aerial. They also occur over settled areas, including towns, urban areas and cities (DAWE 2022b). Due to the broad distribution of the species, its exclusively aerial nature and capacity to utilise the airspace above developed areas the proposed action will not impact the species.

Estuarine crocodile occurs in Australian coastal waters, estuaries, lakes, inland swamps and marshes (Webb et al. 1987) from Rockhampton in Queensland through coastal Northern Territory and to around Broome in Western Australia. Water needs to be deep enough to submerge and requires areas of open sand or mud banks for thermoregulation (Cogger, 2000). Preferred nesting habitats include floating rafts of vegetation and freshwater wetlands and riverbanks that are not influenced by the tides (Webb et al. 1987). The project area does not contain suitable habitat for estuarine crocodile.

The remaining species were previously assessed by RPS (2018) and are unlikely to be impacted by the proposed action.



## 5 CONCLUSION

The fauna habitat values of the project area and surrounds have been substantially altered by a history of vegetation clearing, grazing and pasture development with *U.mozambiquensis*. The limited contemporary habitat values are the product of long-term and cyclical habitat modification typical of agricultural landscapes which continue to operate in the area.

These activities have caused a substantial reduction in the available habitat types and significant simplification of flora and fauna habitat structure. This is evident within the project which consists of widespread cleared areas and small areas of native on elevated sites and lining some watercourses.

The simplification of habitats from a structurally complex remnant community into one with depauperate habitat values has undoubtedly impacted the diversity and abundance of native biota through:

- Provision of favourable conditions for introduced flora and fauna including predatory species such as cats and foxes.
- A long history of cattle access and pasture development resulting in altered fire regimes, trampling of ground layer vegetation and removal of key microhabitats such as coarse woody debris that are required by a range of species.
- The replacement of a diverse ground layer of native perennial and annual grasses and herbs with a monoculture of pasture grass with the primary purpose of cattle fattening.

Given the historical and contemporary disturbance to habitat values within the project area the site was expected to yield a low diversity of taxa. This premise was supported by the field survey which confirmed that the species present consisted primarily of species that are widespread and adaptable to disturbance.

The processes that have impacted species diversity more broadly have also reduced the habitat availability and quality for the target species (ornamental snake, squatter pigeon, *Solanum johnsonianum*, *Solanum dissectum*).

The detection of five ornamental snakes within the project area indicates that in this location, the species is highly resilient to the degraded habitat (i.e. minimal surface microhabitats and lack of canopy) and threatening processes experience over the last 70 years (cattle, blading of soils). The time between significant periods of soil disturbance appear to have been sufficient for population recovery from a source population or at least some individuals survived in-situ.

Squatter pigeon forages and nests in areas with a sparse cover of native tussock grasses and forbs. Naturally this type of habitat may have been more widespread in the project area but since the development and spread of sabi grass pastures it is now restricted to small areas within some watercourses and in elevated areas with shallow, stony surface soils (refer Section 4.10.2 and Figure 7). Three squatter pigeons were detected during targeted surveys, all of which were located on Lot 39 amongst a patchy ground layer of native tussock grasses and forbs.

*S.johnsonianum* and *S.dissectum* grow in brigalow woodland on solodic clay soils. Previous studies have confirmed that the species does not persist in cleared brigalow habitat and does not grow in otherwise suitable habitat where the exotic grass cover is present. Habitat for these species was found to be highly restricted to certain watercourses that were not subject to exotic grass invasion. Targeted surveys successfully confirmed the presence of *Solanum johnsonianum* within the project area which occurred as an isolated population of 72 plants located in the southern extent of Lot 39 (Figure 7).

Other MNES occurring within the project area consisted of approximately 78.7 ha of brigalow woodland. A complete assessment of the diagnostic characteristics and condition thresholds was not undertaken to confirm classification as the Brigalow (*Acacia harpophylla* dominant and co-dominant) listed threatened ecological community under the EPBC Act (Figure 6) as the proponent seeks to avoid these woodlands. Consequently it is assumed that all brigalow woodlands identified are the TEC.

## 6 REFERENCES

- Agnew, L. (2010). Personal Communication. Consultant Biologist, Austecology
- Cogger, H., (2000). Reptiles & Amphibians of Australia. Reed Publishers Australia.
- Coxen's Fig-Parrot Recovery Team (2001). Coxen's Fig-Parrot *Cyclopsitta diophthalma coxeni* Recovery Plan 2001-2005. Report to Environment Australia, Canberra, by Queensland Parks and Wildlife Service, Brisbane.
- DAWE (2022a) Department of Agriculture, Water and the Environment. Species Profile and Threats Database – *Hirundapus caudacutus* – White-throated needletail. Available from: <http://www.environment.gov.au/sprat>.
- DAWE (2022b) Department of Agriculture, Water and the Environment. *Apus pacificus* in Species Profile and Threats Database. Available from: <http://www.environment.gov.au/sprat>.
- Flood, P.G., & Aitchison, C. (1993). New England orogen, eastern Australia: papers presented at a conference held at the University of New England, Armidale, 2-4 February 1993.
- Garnett, S. T., Szabo, J. K. and Dutton, G. (2011). The Action Plan for Australian Birds 2010. CSIRO, Melbourne.
- Higgins, P.J. (ed.) (1999) Handbook of Australian, New Zealand and Antarctic Birds, Volume 4 - Parrots to Dollarbird, Oxford University Press, Melbourne.
- Holmes, G. (1990). The biology and ecology of Coxen's Fig-Parrot. RAOU Report Series. 65.
- Janse, I., Kloecker, U., Roshier, D. and Witte, I. (2015) Breeding diet and behaviour of a pair of Grey Falcons *Falco hypoleucos* and their offspring in north-western New South Wales. *Corella* 39: 46–51.
- Kavanagh RP, Debus S, Tweedie T & Webster R (1995) Distribution of nocturnal forest birds and mammals in north-eastern New South Wales: relationships with environmental variables and management history. *Wildlife Research* 22, 359–377
- Ley, A. and Tynan, B. (2016) Observations on nesting Grey Falcons, *Falco hypoleucos*. *South Australian Ornithologist* 41: 49–64.
- Muller, P.G. (2008) Soils of the Banana Area Central Queensland. Natural Resources and Water, Queensland.
- Murray, C.G. (1975) Rockhampton, Queensland, 1:250 000 geological series explanatory notes. Department of Mines and Energy, Queensland.
- Neldner V.J., Wilson, B.A., Dillewaard, H.A., Ryan T.S., Butler, D.W., McDonald, W.J.F., Addicott E.P. and Appelman, C.N. Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland Version 5.1. Queensland Herbarium, Science and Technology Division Department of Environment and Science.
- Pizzey G., and Knight F. (2010) Field guide to the birds of Australia. Angus & Robertson: HarperCollins, Pymble, N.S.W.
- Rees M, Paull DJ & Carthew SM (2007) Factors influencing the distribution of the yellow-bellied glider (*Petaurus australis australis*) in Victoria, Australia. *Wildlife Research* 34, 228-233.
- RPS (2018). Smoky Creek Solar PV Farm Ecological Assessment. RPS Australia East Pty Ltd, Townsville for Edify Energy.
- Schoenjahn, J. (2013). A hot environment and one type of prey: investigating why the Grey Falcon (*Falco hypoleucos*) is Australia's rarest falcon. *Emu* 113: 19–25.
- Schoenjahn, J. (2018). Adaptations of the rare endemic Grey Falcon *Falco hypoleucos* that enable its permanent residence in the arid zone of Australia. PhD Thesis. University of Queensland.
- Templeton, M.T. (1992). Birds of Nanango, South-East Queensland. *Sunbird*. 22:87-110.

Webb, G.J.W., P.J. Whitehead & S.C. Manolis (1987). Crocodile management in the Northern Territory of Australia. In: Webb, G. J. W., S. C. Manolis & P. J. Whitehead, eds. *Wildlife Management: Crocodiles and Alligators*. Page(s) 107-124. Sydney, Surrey Beatty & Sons.

Woinarski JCZ, Burbidge AA & Harrison PL (2014) *The Action Plan for Australian Mammals 2012*. CSIRO publishing, Collingwood.



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## Appendix A

# EPBC Act Protected Matters Report



# 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: 08-Apr-2022

[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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar)</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	5
<a href="#">Listed Threatened Species:</a>	38
<a href="#">Listed Migratory Species:</a>	15

## 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

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

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

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	20
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	1
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	5
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	None
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	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
<a href="#">Brigalow (Acacia harpophylla dominant and co-dominant)</a>	Endangered	Community known to occur within area	In feature area
<a href="#">Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Poplar Box Grassy Woodland on Alluvial Plains</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Weeping Myall Woodlands</a>	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
<b>BIRD</b>			
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Cyclopsitta diophthalma coxeni</a> Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Erythrotriorchis radiatus</a> Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Geophaps scripta scripta</a> Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Grantiella picta</a> Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Neochmia ruficauda ruficauda</a> Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Poephila cincta cincta</a> Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Rostratula australis</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Turnix melanogaster</a> Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In feature area
<b>MAMMAL</b>			
<a href="#">Chalinolobus dwyeri</a> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Dasyurus hallucatus</a> Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Macroderma gigas</a> Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Nyctophilus corbeni</a> Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Petauroides volans</a> Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Petaurus australis australis</a> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a> 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
<a href="#">Pteropus poliocephalus</a> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
<b>PLANT</b>			
<a href="#">Arthraxon hispidus</a> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Bulbophyllum globuliforme</a> Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#">Cadellia pentastylis</a> Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Cossinia australiana</a> Cossinia [3066]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Cycas megacarpa</a> [55794]	Endangered	Species or species habitat likely to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Dichanthium queenslandicum</a> King Blue-grass [5481]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Dichanthium setosum</a> bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Eucalyptus raveretiana</a> Black Ironbox [16344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#">Macadamia integrifolia</a> Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#">Samadera bidwillii</a> Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Solanum dissectum</a> [75720]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Solanum johnsonianum</a> [84820]	Endangered	Species or species habitat known to occur within area	In feature area
<b>REPTILE</b>			
<a href="#">Delma torquata</a> Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Denisonia maculata</a> Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Egernia rugosa</a> Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Elseya albagula</a> Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Furina dunmalli</a> Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Rheodytes leukops</a> 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
<b>Migratory Marine Birds</b>			
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

### Migratory Marine Species

<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
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### Migratory Terrestrial Species

<a href="#">Cuculus optatus</a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat may occur within area	In feature area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area

### Migratory Wetlands Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

## Other Matters Protected by the EPBC Act

Listed Marine Species			[ Resource Information ]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Anseranas semipalmata</a> Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Chalcites osculans as Chrysococcyx osculans</a> Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Gallinago hardwickii</a> Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Monarcha melanopsis</a> Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Motacilla flava</a> Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Myiagra cyanoleuca</a> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Pandion haliaetus</a> Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
<a href="#">Rhipidura rufifrons</a> Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#">Rostratula australis as Rostratula benghalensis (sensu lato)</a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

## Reptile

<a href="#">Crocodylus porosus</a> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
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## Extra Information

State and Territory Reserves			[ <a href="#">Resource Information</a> ]
Protected Area Name	Reserve Type	State	Buffer Status
Bell Creek	Conservation Park	QLD	In buffer area only

EPBC Act Referrals	[ <a href="#">Resource Information</a> ]
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Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<b>Controlled action</b>				
<a href="#">Callide Wind Farm</a>	2021/9057	Controlled Action	Further Information Request	In buffer area only
<a href="#">Construct and operate 447km high pressure gas transmission pipeline</a>	2009/4976	Controlled Action	Post-Approval	In buffer area only
<a href="#">Smoky Creek Solar Photovoltaic Farm</a>	2021/9030	Controlled Action	Further Information Request	In feature area
<a href="#">ZeroGen Integrated Gasification Combined Cycle Power Plant and CO2 Capture, Transport and Storage</a>	2009/5195	Controlled Action	Completed	In buffer area only
<b>Not controlled action</b>				
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	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](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

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

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

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## Appendix B

### WildNet Search Results





## WildNet species list

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Queensland status: All

Records: All

Date: Since 1980

Latitude: -24.0443

Longitude: 150.4092

Distance: 15

Email: [anton@terrasolutions.com.au](mailto:anton@terrasolutions.com.au)

Date submitted: Friday 08 Apr 2022 14:05:15

Date extracted: Friday 08 Apr 2022 14:10:02

The number of records retrieved = 295

### **Disclaimer**

Information presented on this product is distributed by the Queensland Government as an information source only. While every care is taken to ensure the accuracy of this data, the State of Queensland makes no statements, representations or warranties about the accuracy, reliability, completeness or suitability of any information contained in this product.

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for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.

The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage

(<https://www.qld.gov.au/environment/plants-animals/species-information/wildnet>) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to [wildlife.online@des.qld.gov.au](mailto:wildlife.online@des.qld.gov.au).

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufo	<i>Rhinella marina</i>	cane toad	Y			2
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		2
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		2
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		1
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		2
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		2
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		2
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		2
animals	birds	Acanthizidae	<i>Smicromis brevirostris</i>	weebill		C		1
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		2
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		1
animals	birds	Accipitridae	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		C		1
animals	birds	Accipitridae	<i>Haliaeetus spheonurus</i>	whistling kite		C		1
animals	birds	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher		C		1
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		2
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		C		1
animals	birds	Anhinga	<i>Anhinga novaeollandiae</i>	Australasian darter		C		3
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		1
animals	birds	Ardeidae	<i>Egretta novaeollandiae</i>	white-faced heron		C		3
animals	birds	Ardeidae	<i>Ardeus cinereus</i>	black-faced woodswallow		C		2
animals	birds	Ardeidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		3
animals	birds	Ardeidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		4
animals	birds	Ardeidae	<i>Strepera graculina</i>	pied currawong		C		4
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		5
animals	birds	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo		C		2
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		1
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		1
animals	birds	Campephagidae	<i>Coracina novaeollandiae</i>	black-faced cuckoo-shrike		C		3
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		2
animals	birds	Campephagidae	<i>Lalage tricolor</i>	white-winged triller		C		3
animals	birds	Charadriidae	<i>Vanellus miles novaeollandiae</i>	masked lapwing (southern subspecies)		C		2
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		2
animals	birds	Columbidae	<i>Geopelia placida</i>	peaceful dove		C		4
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		3
animals	birds	Columbidae	<i>Ptilinopus superbus</i>	superb fruit-dove		C		2
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		1
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		3
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		4
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		2
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Eudynamis orientalis</i>	eastern koel		C		2
animals	birds	Cuculidae	<i>Scythrops novaeollandiae</i>	channel-billed cuckoo		C		3
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		2
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Eurostopodidae	<i>Eurostopus argus</i>	spotted nightjar		C		2
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		3
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		4
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		1
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		3
animals	birds	Halcyonidae	<i>Todiramphus macleayi</i>	forest kingfisher		C		3
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		1
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		1
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		5
animals	birds	Megaluridae	<i>Poodytes gramineus</i>	little grassbird		C		1
animals	birds	Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey		C		2
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		1
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		1
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		3
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		1
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		3
animals	birds	Monarchidae	<i>Carterornis leucotis</i>	white-eared monarch		C		2
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		1
animals	birds	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher		SL		2
animals	birds	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher		C		1
animals	birds	Monarchidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		2
animals	birds	Motacillidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		4
animals	birds	Nectariniidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		2
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		3
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		3
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		1
animals	birds	Pachycephalidae	<i>Colluricincla megarrhyncha</i>	little shrike-thrush		C		2
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		2
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		4
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		5
animals	birds	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican		C		1
animals	birds	Petroicidae	<i>Petroica rosea</i>	rose robin		C		2
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	birds	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant		C		1
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		2
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		1
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		1
animals	birds	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		2
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		3
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		2
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		2
animals	birds	Psittacidae	<i>Trichoglossus moluccanus</i>	rainbow lorikeet		C		3
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		6

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animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		7
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		3
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		2
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		3
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat		C		1
animals	mammals	Macropodidae	<i>Notamacropus dorsalis</i>	black-striped wallaby		C		2
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		2
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		2
animals	mammals	Potoroidae	<i>Aepyrymnus rufescens</i>	rufous bettong		C		2
animals	mammals	Pseudocheiridae	<i>Pseudocheirus peregrinus</i>	common ringtail possum		C		2
animals	mammals	Pteropodidae	<i>Pteropus alecto</i>	black flying-fox		C		2
animals	reptiles	Diplodactylidae	<i>Oedura tryoni</i>	southern spotted velvet gecko		C		4
animals	reptiles	Diplodactylidae	<i>Strophurus williamsi</i>	soft-spined gecko		C		2
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake		C		2
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		2
animals	reptiles	Scincidae	<i>Carlia pectoralis sensu lato</i>			C		2
animals	reptiles	Scincidae	<i>Carlia schmeltzii</i>			C		2
animals	reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	robust rainbow-skink		C		2
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	elegant snake-eyed skink		C		2
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	straight-browed ctenotus		C		2
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		2
animals	reptiles	Scincidae	<i>Liburnascincus mundivensis</i>	outcrop rainbow-skink		C		2
animals	reptiles	Scincidae	<i>Morethia taeniopleura</i>	fire-tailed skink		C		2
fungi	Agaricomycetes	Polyporaceae	<i>Pycnoporus coccineus</i>			C		1/1
plants	land plants	Alzooaceae	<i>Zaleya galericulata subsp. galericulata</i>			C		1/1
plants	land plants	Anacardiaceae	<i>Euroschinus falcatius</i>	Burdekin plum		C		1
plants	land plants	Anacardiaceae	<i>Pleiogynium timorense</i>			C		1
plants	land plants	Anacardiaceae	<i>Schinus terebinthifolius</i>		Y	C		1
plants	land plants	Annonaceae	<i>Melodorum leichhardtii</i>			C		1/1
plants	land plants	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1
plants	land plants	Apocynaceae	<i>Alyxia magnifolia</i>			C		1
plants	land plants	Apocynaceae	<i>Alyxia ruscifolia</i>			C		1
plants	land plants	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		1
plants	land plants	Apocynaceae	<i>Casabela thevetia</i>	yellow oleander	Y	C		2/2
plants	land plants	Apocynaceae	<i>Cryptostegia grandiflora</i>	rubber vine	Y	C		4/3
plants	land plants	Apocynaceae	<i>Hoya australis</i>			C		1
plants	land plants	Apocynaceae	<i>Parsonia straminea</i>	monkey rope		C		1
plants	land plants	Apocynaceae	<i>Parsonia velutina</i>	hairy silkpod		C		1
plants	land plants	Apocynaceae	<i>Secamone elliptica</i>			C		1
plants	land plants	Aponogetonaceae	<i>Aponogeton queenlandicus</i>			SL		1/1
plants	land plants	Araliaceae	<i>Polyscias elegans</i>	celery wood		C		2/1
plants	land plants	Araucariaceae	<i>Araucaria cunninghamii</i>	hoop pine		C		1
plants	land plants	Aristolochiaceae	<i>Aristolochia elegans</i>	calico-flower	Y	C		1/1
plants	land plants	Asteraceae	<i>Calotis dentex</i>	white burr daisy	Y	C		1/1
plants	land plants	Asteraceae	<i>Eclipta prostrata</i>	white eclipta	Y	C		1/1
plants	land plants	Asteraceae	<i>Gnaphalium polycaulon</i>		Y	C		1/1
plants	land plants	Asteraceae	<i>Olearia canescens</i>			C		1



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plants	land plants	Asteraceae	<i>Ozothamnus cassinioides</i>			C		1
plants	land plants	Asteraceae	<i>Ozothamnus diosmifolius</i>	white dogwood		C		1
plants	land plants	Asteraceae	<i>Senecio brigalowensis</i>			C		2/2
plants	land plants	Asteraceae	<i>Senecio quadridentatus</i>	cotton fireweed		C		1/1
plants	land plants	Asteraceae	<i>Synedrellopsis grisebachii</i>		Y	C		1/1
plants	land plants	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		1
plants	land plants	Brassicaceae	<i>Rorippa eustylis</i>			C		1/1
plants	land plants	Brassicaceae	<i>Sisymbrium thellungii</i>	African turnip-weed	Y	C		1/1
plants	land plants	Byttneriaceae	<i>Seringia collina</i>			C		1/1
plants	land plants	Cactaceae	<i>Opuntia stricta</i>		Y	C		1
plants	land plants	Capparidaceae	<i>Capparis arborea</i>	brush caper berry		C		1
plants	land plants	Capparidaceae	<i>Capparis shanesiana</i>			C		1/1
plants	land plants	Casuarinaceae	<i>Allocasuarina luehmanna</i>	bull oak		C		1
plants	land plants	Celastraceae	<i>Denhamia oleaster</i>			C		1
plants	land plants	Celastraceae	<i>Elaeodendron australe</i>			C		1
plants	land plants	Celastraceae	<i>Siphonodon australis</i>	ivorywood		C		1
plants	land plants	Chenopodiaceae	<i>Dysphania glomulifera</i> subsp. <i>glomulifera</i>			C		1/1
plants	land plants	Combretaceae	<i>Terminalia porphyrocarpa</i>			C		1
plants	land plants	Cucurbitaceae	<i>Cucumis dipsaceus</i>	star cucumber	Y	C		1/1
plants	land plants	Cucurbitaceae	<i>Sicyos australis</i>			C		1
plants	land plants	Cyperaceae	<i>Bolboschoenus fluviatilis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Bulbostylis barbata</i>			C		1/1
plants	land plants	Cyperaceae	<i>Eleocharis pallens</i>	pale spikerush		C		1/1
plants	land plants	Dioscoreaceae	<i>Dioscorea transversa</i>	native yam		C		1
plants	land plants	Ebenaceae	<i>Diospyros fasciculosa</i>	grey ebony		C		2
plants	land plants	Ebenaceae	<i>Diospyros geminata</i>	scaly ebony		C		1
plants	land plants	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		2/1
plants	land plants	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree	Y	C		1
plants	land plants	Euphorbiaceae	<i>Acalypha capillipes</i>	small-leaved acalypha		C		1
plants	land plants	Euphorbiaceae	<i>Croton insularis</i>	Queensland cascarilla		C		1
plants	land plants	Euphorbiaceae	<i>Croton pheballoides</i>	narrow-leaved croton		C		1
plants	land plants	Euphorbiaceae	<i>Excoecaria dallachyana</i>	scrub poison tree		C		1
plants	land plants	Euphorbiaceae	<i>Ricinocarpos ledifolius</i>	scrub wedding bush		C		1/1
plants	land plants	Goodeniaceae	<i>Goodenia rosulata</i>			C		1/1
plants	land plants	Goodeniaceae	<i>Goodenia rotundifolia</i>			C		1
plants	land plants	Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	scrambling lily		C		1
plants	land plants	Hernandiaceae	<i>Gyrocarpus americanus</i>			C		1
plants	land plants	Lamiaceae	<i>Basilicum polystachyon</i>			C		1/1
plants	land plants	Lamiaceae	<i>Clerodendrum floribundum</i>			C		1
plants	land plants	Lamiaceae	<i>Glossocarya hemiderma</i>			C		2
plants	land plants	Lauraceae	<i>Cassytha filiformis</i>	dodder laurel		C		1
plants	land plants	Leguminosae	<i>Acacia acradenia</i>			C		1
plants	land plants	Leguminosae	<i>Acacia aulacocarpa</i>			C		1
plants	land plants	Leguminosae	<i>Acacia crassa</i>			C		1
plants	land plants	Leguminosae	<i>Acacia decora</i>	pretty wattle		C		1/1
plants	land plants	Leguminosae	<i>Acacia fasciculifera</i>	scaly bark		C		1

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plants	land plants	Leguminosae	<i>Acacia harpophylla</i>	brigalow		C		2/1
plants	land plants	Leguminosae	<i>Acacia salicina</i>	doolan		C		2/1
plants	land plants	Leguminosae	<i>Acacia spania</i>			NT		1/1
plants	land plants	Leguminosae	<i>Aeschynomene indica</i>	budda pea		C		1/1
plants	land plants	Leguminosae	<i>Archidendropsis thozetiana</i>			C		1
plants	land plants	Leguminosae	<i>Cassia tomentella</i>			C		3/3
plants	land plants	Leguminosae	<i>Crotalaria incana subsp. incana</i>		Y			1/1
plants	land plants	Leguminosae	<i>Crotalaria verrucosa</i>			C		1/1
plants	land plants	Leguminosae	<i>Hovea longipes</i>	brush hovea		C		2/1
plants	land plants	Leguminosae	<i>Labiab purpureus</i>	lablab	Y			1/1
plants	land plants	Leguminosae	<i>Leucaena leucocephala subsp. glabrata</i>		Y			1/1
plants	land plants	Leguminosae	<i>Senna gaudichaudii</i>			C		1
plants	land plants	Leguminosae	<i>Swainsona luteola</i>	dwarf darling pea		C		1/1
plants	land plants	Leguminosae	<i>Vachellia bidwillii</i>			C		1
plants	land plants	Leguminosae	<i>Vicia monantha subsp. triflora</i>		Y			1/1
plants	land plants	Loganiaceae	<i>Strychnos psilosperma</i>	strychnine tree		C		1
plants	land plants	Malvaceae	<i>Abutilon oxycarpum</i>			C		1
plants	land plants	Malvaceae	<i>Hibiscus sp. (Emerald S.L. Everist 2124)</i>			C		1/1
plants	land plants	Meliaceae	<i>Melia azedarach</i>	white cedar		C		1
plants	land plants	Meliaceae	<i>Turraea pubescens</i>	native honeysuckle		C		1
plants	land plants	Menispermaceae	<i>Sarcopetalum harveyanum</i>	pearl vine		C		1
plants	land plants	Menispermaceae	<i>Tinospora smilacina</i>	snakevine		C		1
plants	land plants	Moraceae	<i>Ficus macrophylla forma macrophylla</i>	Moreton Bay fig		C		1
plants	land plants	Moraceae	<i>Ficus obliqua</i>			C		1
plants	land plants	Moraceae	<i>Ficus virens</i>			C		2
plants	land plants	Moraceae	<i>Trophis scandens subsp. scandens</i>			C		1
plants	land plants	Myrtaceae	<i>Backhousia angustifolia</i>	narrow-leaved backhousia		C		1
plants	land plants	Myrtaceae	<i>Corymbia erythrophloia</i>	variable-barked bloodwood		C		1
plants	land plants	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		1
plants	land plants	Myrtaceae	<i>Eucalyptus coolabah</i>	coolabah		C		3/2
plants	land plants	Myrtaceae	<i>Eucalyptus melanophloia</i>			C		2
plants	land plants	Myrtaceae	<i>Eucalyptus tereticornis</i>			C		1
plants	land plants	Myrtaceae	<i>Gossia bidwillii</i>			C		2
plants	land plants	Myrtaceae	<i>Melaleuca bracteata</i>			C		1
plants	land plants	Nymphaeaceae	<i>Nymphaea gigantea</i>			C		1/1
plants	land plants	Oleaceae	<i>Jasminum didymum</i>			SL		1/1
plants	land plants	Oleaceae	<i>Jasminum didymum subsp. racemosum</i>			C		1
plants	land plants	Oleaceae	<i>Jasminum simplicifolium</i>			C		1/1
plants	land plants	Oleaceae	<i>Notelaea microcarpa</i>			C		1
plants	land plants	Petiveriaceae	<i>Rivina humilis</i>		Y			1
plants	land plants	Phyllanthaceae	<i>Bryonia oblongifolia</i>			C		1
plants	land plants	Phyllanthaceae	<i>Flueggea leucopyrus</i>			C		1
plants	land plants	Phyllanthaceae	<i>Phyllanthus hebecarpus</i>			C		1/1
plants	land plants	Picrodendraceae	<i>Dissiliaria baloghioides</i>	hauer		C		1
plants	land plants	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		1
plants	land plants	Pittosporaceae	<i>Pittosporum spinescens</i>			C		1

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plants	land plants	Plantaginaceae	<i>Callitriche sonderi</i>			C		1/1
plants	land plants	Poaceae	<i>Alloteropsis cimicina</i>			C		1/1
plants	land plants	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		1
plants	land plants	Poaceae	<i>Aristida</i>					1
plants	land plants	Poaceae	<i>Calyptochloa gracillima</i> subsp. <i>gracillima</i>			C		1/1
plants	land plants	Poaceae	<i>Enneapogon</i>					1
plants	land plants	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		1
plants	land plants	Poaceae	<i>Hymenachne amplexicaulis</i> 'Olive'		Y			2/2
plants	land plants	Poaceae	<i>Opismenus aemulus</i>	creeping shade grass		C		1
plants	land plants	Poaceae	<i>Panicum larcomianum</i>	giant Parramatta grass	Y			1/1
plants	land plants	Poaceae	<i>Sporobolus fertilis</i>			C		1/1
plants	land plants	Poaceae	<i>Thyridolepis xerophila</i>			C		1
plants	land plants	Polygonaceae	<i>Duma florulenta</i>			C		1/1
plants	land plants	Polygonaceae	<i>Polygonum plebeium</i>	small knotweed		C		1/1
plants	land plants	Proteaceae	<i>Macadamia integrifolia</i>	macadamia nut		V	V	4
plants	land plants	Pteridaceae	<i>Cheilanthes sieberi</i>			C		1
plants	land plants	Putranjivaceae	<i>Drypetes deplanchei</i>	grey boxwood		C		1
plants	land plants	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		1
plants	land plants	Rubiaceae	<i>Atractocarpus chartaceus</i>			C		1
plants	land plants	Rubiaceae	<i>Cyclophyllum coprosmoides</i> var. <i>coprosmoides</i>			C		2/2
plants	land plants	Rubiaceae	<i>Dentella repens</i>	dentella		C		2/2
plants	land plants	Rubiaceae	<i>Psychodra odorata</i>			C		1
plants	land plants	Rubiaceae	<i>Triflorensia ixoroides</i>			C		3/2
plants	land plants	Rubiaceae	<i>Acronychia laevis</i>			C		1
plants	land plants	Rutaceae	<i>Coatesia paniculata</i>	glossy acronychia		C		1
plants	land plants	Rutaceae	<i>Diosperma erythrococcum</i>			C		1
plants	land plants	Rutaceae	<i>Flindersia australis</i>	crow's ash		C		2
plants	land plants	Rutaceae	<i>Flindersia schottiana</i>	bumpy ash		C		1
plants	land plants	Rutaceae	<i>Flindersia xanthoxyla</i>	yellow-wood		C		1
plants	land plants	Rutaceae	<i>Geijera parviflora</i>	wilga		C		1
plants	land plants	Rutaceae	<i>Geijera salicifolia</i>	brush wilga		C		1
plants	land plants	Rutaceae	<i>Micromelum minutum</i>	clusterberry		C		1
plants	land plants	Rutaceae	<i>Murraya paniculata</i> 'Exotica'		Y			1
plants	land plants	Rutaceae	<i>Sarcamelicope simplicifolia</i> subsp. <i>simplicifolia</i>	yellow aspen		C		1
plants	land plants	Santalaceae	<i>Santalum lanceolatum</i>			SL		1
plants	land plants	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		1/1
plants	land plants	Sapindaceae	<i>Atalaya hemiglauca</i>			C		1
plants	land plants	Sapindaceae	<i>Atalaya salicifolia</i>			C		1
plants	land plants	Sapindaceae	<i>Cupaniopsis anacardioides</i>	tuckeroo		C		2/1
plants	land plants	Sapindaceae	<i>Dodonaea stenophylla</i>	white tamarind		C		2/1
plants	land plants	Sapindaceae	<i>Elaeostachys xylocarpa</i>			C		1
plants	land plants	Sapotaceae	<i>Planchonella cotinifolia</i> var. <i>pubescens</i>			C		1
plants	land plants	Sapotaceae	<i>Planchonella pohlmiana</i>			C		1
plants	land plants	Sapotaceae	<i>Pleioluma queenslandica</i>			C		1
plants	land plants	Scrophulariaceae	<i>Eremophila mitchellii</i>	tree tobacco	Y			1/1
plants	land plants	Solanaceae	<i>Nicotiana glauca</i>			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Solanaceae	<i>Solanum</i>					1/1
plants	land plants	Solanaceae	<i>Solanum dissectum</i>			E	E	3/3
plants	land plants	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		1/1
plants	land plants	Solanaceae	<i>Solanum johnsonianum</i>			E	E	6/5
plants	land plants	Solanaceae	<i>Solanum parvifolium</i> subsp. <i>parvifolium</i>			C		1/1
plants	land plants	Solanaceae	<i>Solanum seafortianum</i>		Y			1
plants	land plants	Solanaceae	<i>Solanum stelligerum</i>	Brazilian nightshade		C		1
plants	land plants	Sparmanniaceae	<i>Grewia latifolia</i>	devil's needles		C		1
plants	land plants	Sterculiaceae	<i>Argyrodendron trifoliolatum</i>	dysentery plant		C		1
plants	land plants	Sterculiaceae	<i>Brachychiton australis</i>	booyong		C		2
plants	land plants	Sterculiaceae	<i>Brachychiton populneus</i>	broad-leaved bottle tree		SL		1
plants	land plants	Sterculiaceae	<i>Brachychiton rupestris</i>			C		1
plants	land plants	Stylidiaceae	<i>Stylidium eglanulosum</i>			SL		1/1
plants	land plants	Verbenaceae	<i>Glandularia aristigera</i>		Y			1
plants	land plants	Verbenaceae	<i>Lantana camara</i>	lantana	Y			3/1
plants	land plants	Verbenaceae	<i>Lantana montevidensis</i>	creeping lantana	Y			1
plants	land plants	Vitaceae	<i>Cayratia acris</i>	hairy grape		C		2
plants	land plants	Vitaceae	<i>Cissus oblonga</i>			C		1
plants	land plants	Vitaceae	<i>Clematicissus opaca</i>			C		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.



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## Appendix C

### Herbarium confirmation of *Solanun johnsonianum*



Queensland  
Government

Department of  
Environment and Science

## Queensland Herbarium

Brisbane Botanic Gardens Mt Coot-tha • Toowong 4066 Queensland • Australia  
Telephone +61 7 3199 7699 • Facsimile +61 7 3876 1278  
e-mail [Queensland.Herbarium@qld.gov.au](mailto:Queensland.Herbarium@qld.gov.au)  
<http://www.qld.gov.au/herbarium>

Enquiries	Jason Halford
Telephone	07 3199 7666
Your reference	
Our reference	JJH:ss 80/22

25 February 2022

Mr Simon Danielsen  
Astrebla Ecological Services  
47/20 Sanflex Street  
DARRA QLD 4076

Dear Simon,

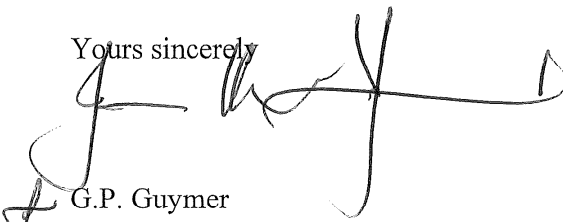
The botanical specimen received by the Queensland Herbarium on 15 February 2022, has been identified as:

2230                      # *Solanum johnsonianum*, confirmed. This species is listed as  
Endangered under Queensland's *Nature Conservation Act 1992*.

# This specimen has been kept for incorporation into the Herbarium collection, with thanks.

Thank you for your payment. The amount of \$121.00 (GST inclusive) has been paid for this identification.

Yours sincerely



G.P. Guymer  
Director