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TERRESTRIAL ECOLOGY REPORT





**ECO SOLUTIONS
& MANAGEMENT**

**BIG VEIN SOUTH PROJECT
TERRESTRIAL ECOLOGY ASSESSMENT
FOR RESIDUAL MSES**

Hansen Environmental Consulting
September 2026

ecosm.com.au
contact.team@ecosm.com.au

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Author(s):	Meredith Watherston/Charlotte Kilpatrick
Reviewed by:	Monica Campbell/Steve Marston
Approved by:	Steve Marston
Signed:	

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Symbols and Abbreviations

*	(Preceding a plant species name) plant species not native to Australia
±	With or without, more or less
AHD	Average height datum
BAMM	Biodiversity Assessment and Mapping Methodology
Biosecurity Act	(Queensland) <i>Biosecurity Act 2014</i>
BoM	Bureau of Meteorology
BPA	Biodiversity Planning Assessment
BVS	Big Vein South
CIL	Carbon In-Leach
DAF	(Queensland) Department of Agriculture and Fisheries
DAWE	Former (Commonwealth) Department of Agriculture, Water and the Environment
DCCEEW	(Commonwealth) Department of Climate Change, Energy, the Environment and Water
DES	(Queensland) Department of Environment and Science
DR	(Queensland) Department of Resources
EHP	Former (Queensland) Department of Environment and Heritage Protection
EO Act	(Queensland) Environmental Offsets Act 2014
EP Act	(Queensland) <i>Environmental Protection Act 1994</i>
EPBC Act	(Commonwealth) <i>Environment Protection and Biodiversity Conservation Act 1999</i>
GBO	General biosecurity obligation
GES	General ecological significance
GPS	Global positioning system
ha	Hectares
HES	High ecological significance
km	Kilometres
ML	Mining lease
MNES	Matters of national environmental significance (EPBC Act)
MSES	Matters of state environmental significance (EO Act)

Mtpa	Million tonnes per annum
NC Act	(Queensland) <i>Nature Conservation Act 1992</i>
QEOP	Queensland Environmental Offsets Policy 2014
RE	Regional Ecosystem as defined under the Queensland Vegetation Management Regulation 2000
REDD	Regional Ecosystem Description Database
ROM	Run of Mine
RI	Restricted invasive
SRI Guideline	Queensland Environmental Offsets Policy Significant Residual Impact Guideline
SMP	Species Management Program (NC Act)
SPRAT	Species Profile and Threats Database
TSSC	Threatened Species Scientific Committee
VM Act	(Queensland) <i>Vegetation Management Act 1999</i>
WoNS	Weeds of National Significance
WPA	Wetland protection area
WRD	Waste Rock Dumps

Glossary

Term	Definition
Biodiversity status	This is a DES classification dependent on condition of remnant vegetation <i>in addition</i> to the criteria used to determine class under the Queensland <i>Vegetation Management Act 1999</i>. This classification is used for a range of planning and management applications, i.e. to determine environmentally sensitive areas. A regional ecosystem is listed as 'endangered' if: ▪ Less than 10% of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss; or ▪ 10-30% of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 ha; or ▪ It is a rare regional ecosystem subject to a threatening process. A regional ecosystem is listed as 'of concern' if: ▪ 10-30% of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss. A regional ecosystem is listed as 'no concern at present' if: The degradation criteria listed above for 'endangered' or 'of concern' regional ecosystems is not met.
Bioregion	A geographically distinct biological region, which is a reporting unit for assessing the status of native ecosystems and their level of protection. Australia is divided into 89 bioregions. Bioregions form part of the regional ecosystem classification code system. The project sites is divided roughly in half between the Gilberton Plateau subregion in the north and the Claraville Plains subregion in the south, and overall within the Gulf Plains Bioregion.
MSES	A matter of State environmental significance listed in Schedule 2 of the Queensland Environmental Offsets Regulation 2014 including: ▪ Regulated vegetation ▪ Connectivity areas ▪ Wetlands and watercourses ▪ High preservation areas of wild river areas ▪ Protected wildlife habitat ▪ Protected areas ▪ Highly protected zones of State marine parks ▪ Fish habitat areas ▪ Waterways providing for fish passage ▪ Marine plants ▪ Legally secured offset areas.
NC Act conservation status	Under the <i>Nature Conservation Act 1992</i>, native wildlife may be prescribed as: Extinct:

Term	Definition
	▪ There is no reasonable doubt the last member of the species had died. Extinct in the wild: ▪ The wildlife is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or ▪ The wildlife is not known to survive in its known or expected habitat, in its past range, over a period appropriate for the life cycle or form of the wildlife. Critically endangered: ▪ The wildlife has undergone or is suspected to have undergone a very large reduction in numbers; or ▪ It is likely that a very large reduction in the wildlife's numbers is imminent; or ▪ The wildlife's geographic distribution is precarious for the survival of the wildlife and very restricted; or ▪ The estimated total number of mature individuals is very low and it is likely the number will continue to decline at a very high rate, or continue to decline, and its geographic distribution is precarious for the survival of the wildlife; or ▪ The estimated total number of mature individuals is extremely low; or ▪ The probability of the wildlife's extinction in the wild is at least 50% in the immediate future. Endangered: ▪ There have not been thorough searches conducted for the wildlife and the wildlife has not been seen in the wild over a period that is appropriate for the life cycle or form of the wildlife; or ▪ The habitat or distribution of the wildlife has been reduced to an extent that the wildlife may be in danger of extinction; or ▪ The population size of the wildlife has declined, or is likely to decline, to an extent that the wildlife may be in danger of extinction; or ▪ The survival of the wildlife in the wild is unlikely if a threatening process continues. Vulnerable: ▪ The population is decreasing because of threatening processes; or ▪ The population has been seriously depleted and its protection is not secured; or ▪ The population, while abundant, is at risk because of threatening processes; or ▪ The population is low or localised or depends on limited habitat that is at risk because of threatening process. Near threatened: ▪ The population size or distribution of the wildlife is small and may become smaller; or

Term	Definition
	▪ The population size of the wildlife has declined, or is likely to decline, at a rate higher than the usual rate for population changes for the wildlife; or ▪ The survival of the wildlife in the wild is affected to an extent that the wildlife is in danger of becoming vulnerable. Least concern: ▪ The Wildlife is common or abundant and is likely to survive in the wild. Special least concern: ▪ the echidna (<i>Tachyglossus aculeatus</i>) ▪ the platypus (<i>Ornithorhynchus anatinus</i>) ▪ a least concern bird to which any of the following apply – - Agreement Between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA) - Agreement Between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA) - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).
Project site	An area defined for the purposes of this impact assessment and shown on Figures 1 and 2, and which comprises the entirety of ML 100236.
Region	The local area surrounding the project site, including the landscape within 50 km of the project site.
Regional ecosystem	A vegetation community within a bioregion that is consistently associated with a particular combination of geology, landform and soils.
Remnant vegetation	Defined under the Queensland <i>Vegetation Management Act 1999</i> as, woody vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.
Significant flora and fauna	Refers to: ▪ species listed as endangered, vulnerable or near threatened under the Queensland Nature Conservation (Wildlife) Regulation 2006 or ▪ regional ecosystems with an endangered or of concern biodiversity status or <i>Vegetation Management Act 1999</i> status.
Vegetation Management Act status	This is a statutory classification under the Queensland <i>Vegetation Management Act 1999</i> . A regional ecosystem is listed as 'endangered' if:

Term	Definition
	▪ Remnant vegetation for the regional ecosystem is less than 10% of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation for the regional ecosystem is less than 10,000 ha. A regional ecosystem is listed as 'of concern' if: ▪ Remnant vegetation for the regional ecosystem is 10-30% of its pre-clearing extent across the bioregion; or more than 30% of its pre-clearing extent remains and the remnant vegetation extent for the regional ecosystem is less than 10,000 ha. A regional ecosystem is listed 'least concern' if: Remnant vegetation for the regional ecosystem is over 30% of its pre-clearing extent across the bioregion, and the remnant vegetation area for the regional ecosystem is greater than 10,000 ha.

1 Introduction

Eco Solutions & Management was commissioned by Strategic Minerals Corporation to complete a Terrestrial Ecology Assessment of Matters of State Environmental Significance (MSES) as part of the Environmental Assessment Report (EAR) for the Big Vein South Gold Project (the project).

A separate assessment of matters of national environmental significance (MNES) has been undertaken for the project under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The MNES assessment included assessment of impacts to dual listed species and communities that are listed under both the EPBC Act and Queensland *Environmental Offsets Act 2014* (EO Act).

Therefore, this report is limited to assessing impacts to residual (not previously assessed as part of the EPBC Act assessment) MSES listed under the EO Act.

1.1 Project description

The project involves the construction and operation of an open cut gold mine on a greenfield site in North Queensland. The project site covers an area of approximately 2,281 ha and is located approximately 100 km north of Richmond and 380 km west of Townsville (Figure 1).

Open cut mining will be conducted using excavators and trucks. Gold ore will be processed on site to produce gold dore (solid bars containing gold alloy). The mine's peak production rate will be up to 1.95 million tonnes per annum (Mtpa) of run of mine (ROM) gold ore, yielding up to approximately 100,000 ounces of gold dore per annum. The mine life will be approximately 11 years.

The following mining and ore processing activities will be undertaken as part of the project:

- developing three open cut pits, as follows:
 - the main Big Vein South Pit (BVS Pit) located in the centre of the project site (Figure 2). Waste rock from this pit will be hauled by truck and stored in the Central and Southern Waste Rock Dumps (WRDs).
 - two small satellite pits, BV1 Pit and BV2 Pit, located in the northern part of the project site (Figure 2). Waste rock from these pits will be stored in the Northern WRD.
- transporting mined ore in haul trucks from the open cut pits to the ROM area ore stockpiles located near the mine processing facilities at the southern end of the project site (Figure 2).
- processing ore from the BV1 and BV2 Pits in the first 2 years of mining using Heap Leach Pads and gold elution. Processing ore mined from the BVS Pit in an on-site Carbon In-Leach (CIL) Plant from Year 3 onwards. The heap leaching process will generate spent heap leach residues. These residues

will be reprocessed in the CIL Plant over the life of the mine. The CIL Plant will generate wet tailings and dewatered tailings. Wet tailings will be pumped to a Tailings Storage Cell. Dewatered tailings will be stored with waste rock in the Central and Southern WRDs.

- transporting dore bars from the site via plane to a refinery.

The majority of the mine infrastructure will be located at the southern end of the project site (Figure 2). Key mine infrastructure will include ore processing facilities, workshop, warehouse, administration buildings, haul roads and access roads, vehicle servicing, refuelling and wash down facilities, fuel storage facilities, diesel and solar power station, water supply and water management infrastructure. Workforce accommodation and a private airstrip will also be located at the southern end of the project site.

1.2 Study objectives

This report assesses the potential impacts of the project on residual MSES and specifically:

- describes the current Queensland regulatory requirements relevant to the project
- describes the methodologies used, including desktop searches and field surveys which were designed in accordance with the Queensland flora and fauna survey guidelines
- provides a comprehensive flora and fauna inventory of the project site
- provides regional ecosystem (RE) mapping developed in accordance with the *Methodology for Surveying and mapping of regional ecosystems and vegetation communities in Queensland, Versions 5.1 and 3.2* (Neldner et al. 2020; 2012), which were current at the time of the field surveys, and then validated by the Queensland Herbarium
- assesses the likelihood of occurrence for residual MSES, and identifies and maps their habitat
- assesses the direct and potential impacts of the project on residual MSES within the project site
- provides mitigation and management measures to reduce impacts on identified MSES
- assesses the likely requirements for offsets under the EO Act.

1.3 Regional context

The project site is located within the Gulf Plains Biogeographic region in the Gulf region of northern Queensland and within the Woolgar River catchment of the Flinders River basin, which drains into the Gulf of Carpentaria. The region experiences arid to sub-tropical conditions with mean minimum and maximum temperature ranges recorded at Richmond Airport Bureau of Meteorology (BoM)

weather station of between 22.9°C and 38.5°C in the summer months, and 9.1°C and 29.2°C in the winter months (BoM 2022). The Gilberton BoM Station, the nearest long-term rainfall monitoring site, receives a mean annual rainfall of approximately 689 mm, with a pronounced wet season. The total average rainfall recorded during the wet season (November and April) is 642 mm (BoM 2022).

The project site sits on the south-west edge of the Gregory Range, which stretches approximately 200 km in length to the north and south-east of the project site. The predominant land use in the region is cattle grazing, with gold mining also historically taking place in the immediate area.

A number of Nature Refuges and National Parks have been established in the Gregory Range, the closest being the Rungulla Resources Reserve, Bellfield Nature Refuge and Rungulla National Park, all situated within approximately 35 km to the north-north-east of the project site. No World Heritage Areas or other conservation areas are located in the region.

1.4 Description of the study area

The study area for this assessment is the project site, which encompasses the project mining lease area as shown on Figure 2. The project site is within the Gulf Plains Biogeographic region. Specifically, the northern half of the project site is within the Gilberton Plateau Biogeographic subregion and the southern half of the project site is within the Claraville Plains Biogeographic subregion.

The project site is approximately 2,281 ha and is almost entirely mapped as supporting least concern remnant vegetation. Narrow corridors of high-value regrowth vegetation and cleared areas are associated with two existing road corridors that provide access to the homesteads in the area surrounding the project site.

The project site is located on the south-western edge of the Gregory Range at elevations of between 360 m average height datum (AHD) in the west and 450 m in the east. The majority of the project site slopes gradually to the west towards the Woolgar River, and is generally uniform in landform. However, the eastern portion of the project site transitions to elevated rocky plateaus and ridgelines that are dissected by streams and gullies.

Numerous 1st and 2nd, and one 3rd order stream dissect the project site and flow in a primarily westerly direction towards the Woolgar River. The Woolgar River is a 6th order watercourse that joins the Stawall River approximately 73 km downstream (i.e. along the river channel) of the project site. The Stawall River enters the Flinders River approximately 56 km downstream of the Woolgar River confluence. The drainage features within the project site are all ephemeral and were generally dry during field surveys, with the exception of a small pool that was noted in the Woolgar River (Figure 6). This pool appeared to have been excavated in the bed of the river to provide stock access to water. Two small farm dams are present in the central west of the project site and are also shown on Figure 6.

The project site overlaps two grazing properties, 'Middle Park' and Mt Norman'.

2 Regulatory framework

2.1 Vegetation Management Act 1999

The Queensland *Vegetation Management Act 1999* (VM Act) is administered by the Queensland Department of Resources (DR). The VM Act, in conjunction with the Queensland *Planning Act 2016* (Planning Act), regulates the clearing of native vegetation in Queensland. The VM Act's objectives include the preservation of remnant endangered ecosystems, vegetation in areas of high nature conservation value or lands vulnerable to land degradation, high value regrowth vegetation and regrowth watercourses and watercourse vegetation on Indigenous, freehold and leasehold land in rural areas utilised for agriculture and grazing. Permits under either the VM Act or Planning Act for vegetation clearing are not required for the project, given it is located within MLs and will be regulated by the Environmental Authority (EA) issued under the *Environmental Protection Act 1994* (EP Act).

The VM Act provides for the classification of remnant vegetation into regional ecosystems (REs) that form the basis of the assessment of vegetation communities. REs are defined by (Sattler and Williams 1999) as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The Queensland Government maintains RE maps illustrating the distribution of REs throughout Queensland and these are updated periodically to reflect refinements that have been made through ground-truthing these communities.

The VM Act classification system was used to map the vegetation within the project site (Section 4.1).

2.2 Queensland Nature Conservation Act 1992

The NC Act is the key piece of legislation in Queensland relating to the protection and management of biodiversity and threatened species. It establishes a framework for the identification, gazettal and management of protected areas (such as National Parks) and the protection of native flora and fauna (protected wildlife) listed under the Queensland *Nature Conservation (Wildlife) Regulation 2006*. The NC Act is administered by the Department of Environment and Science (DES).

The NC Act classifies native flora and fauna species into categories of conservation significance including extinct in the wild, critically endangered, endangered, vulnerable, near threatened, special least concern and least concern in recognition of how threatened they are and what action needs to be taken to protect them.

The NC Act classification system for fauna was used in this assessment.

2.3 Queensland Biosecurity Act 2014

The Queensland *Biosecurity Act 2014* (Biosecurity Act) provides a framework for the control and management of pests, weeds, diseases, and contaminants, along with creating an overarching general biosecurity obligation for the State, companies, and individuals. The key principle of the Act is shared responsibility for the mitigation of biosecurity risks.

The Biosecurity Act lists biosecurity matters as either prohibited or restricted. Prohibited matters are biosecurity matters that are not yet found in Queensland. Restricted matters are biosecurity matters found in Queensland that require restrictions to reduce, control or contain the matter. The Act details seven categories of restricted matters, based on the level on mitigation required. The seven categories of restricted matters are:

- Category 1 and 2 must be reported to the Department of Agriculture and Fisheries (DAF) within 24 hours of becoming aware of their presence
- Category 3 must not be distributed or released into the environment
- Category 4 must not be moved or spread into other areas of the State
- Category 5 are those that have a high risk of negatively impacting the environment, and must not be kept
- Category 6 must not be kept or fed
- Category 7 must be killed and disposed of if caught or found.

Some restricted matters fall into multiple categories, and therefore require several different management measures for their control.

The Biosecurity Act also recognises other invasive species (such as Cane Toads) as species that fall under a general biosecurity obligation (GBO). A GBO means that, while there is no legal requirement for control of these pests, reasonable and practical steps must be undertaken to minimise their spread.

The Biosecurity Act is administered by Queensland Department of Agriculture and Fisheries (DAF).

Species listed under the Biosecurity Act have been identified in this assessment.

2.4 Queensland Environmental Protection Act 1994

The EP Act is administered by the DES and was established to protect Queensland's environment, while allowing for development that improves the total quality of life, both now and in the future.

The EP Act uses a number of mechanisms to achieve its objectives, including the following that are relevant to this report:

- requirement for mining projects to obtain an EA prior to operation
- requirement for an environmental impact assessment process in support of an EA application.

This terrestrial ecology MSES assessment supports an EA application.

2.5 Queensland Environmental Offsets Act 2014

The EO Act, *Environmental Offsets Regulation 2014* (EO Regulation) and *Queensland Environmental Offsets Policy* (Version 1.12) (QEOP) (DES 2022) comprise the Queensland Environmental Offsets Framework. According to this framework, it is necessary to provide offsets for any significant, residual impacts on MNES, MSES and matters of local environmental significance (MLES). However, as stated in the EO Act, an offset for a prescribed environmental matter which has been assessed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (i.e. a dual listed MSES) is not subject to offset conditions under the EO Act. This project will be referred to the Commonwealth for assessment under the EPBC Act, therefore, this report only assesses the residual MSES (i.e. MSES that are *not* dual listed under the EPBC Act).

The EO Regulation prescribes a number of MSES that are potentially relevant to terrestrial ecology. These include:

- regulated vegetation under the VM Act that are:
 - endangered REs
 - of concern REs
 - REs that intersect with wetlands identified on the vegetation management wetlands map
 - REs that comprise an area of essential habitat, in accordance with the VM Act, for protected wildlife
 - REs located within a defined distance from the defining banks of a relevant watercourse
- connectivity areas, comprising remnant REs that contain an area of land that is required for ecosystem functioning (i.e. a connectivity area)
- wetlands in a wetland protection area (WPA) or a high ecological significance (HES) wetland as shown on the map of referable wetlands or in High Ecological Value (HEV) waters
- a designated precinct in a strategic environmental area
- high risk areas identified on the flora survey trigger map that contains flora species that are listed as endangered or vulnerable under the NC Act
- areas not identified as a high risk area on the flora survey trigger map, to the extent that the area contains flora species that are listed as endangered or vulnerable under the NC Act
- a koala habitat area
- habitat for terrestrial fauna species that are listed as special least concern (as defined within the EO Regulation), vulnerable or endangered under the NC Act
- protected areas
- legally secured offset areas.

High-value regrowth vegetation under the VM Act is not listed as a prescribed environmental matter under the EO Act.

The MSES relevant to the project site listed above are discussed in Section 4. WPAs, HES wetland and HEV waters are discussed in the EAR Aquatic Ecology Report.

The DES *Queensland Environmental Offsets Policy Significant Residual Impact Guideline* (SRI Guideline) (EHP 2014a) dated December 2014 has been used to determine if offsets are required for impacts to residual MSES (Section 5.1.3).

3 Methodology

A detailed description of the methodology used to prepare this ecological assessment is provided in Appendix A. A summary of the methodology is as follows:

- Desktop searches of Commonwealth and State databases and mapping, literature reviews, previous ecology assessments in the local area, aerial photography and the State geology mapping. This information formed the basis for the field work program. Database search results, which are provided in Appendix B, encompassed the entire project site and a 50 km buffer area. A detailed desktop assessment is provided in Appendix C.
- Flora surveys were undertaken over 11 days in the early wet season 2015 (12 to 22 November, inclusive), 8 days in the early dry season 2016 (11 to 18 April, inclusive), 3 days in the early wet season in 2017 (19, 21 and 24 November) and another 9 days in the early dry season 2021 (27 April to 5 May, inclusive).

The surveys were conducted in accordance with the '*Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Versions 3.2 and 5.1*' (Neldner et al. 2020; 2012), which were current at the time of the surveys, to collect information on listed flora species, vegetation communities, and habitat types. Reference was also made to the *Guidelines for Flora Survey and Assessment in Northern Queensland* (Wannan n.d.). The field work included:

- 36 detailed secondary sites
- 83 tertiary sites
- 55 quaternary sites
- targeted flora species and ecological community surveys
- random traverses
- collection of ancillary information.

In addition to the above vegetation assessment sites, 17 secondary sites were upgraded to habitat quality plots and vegetation condition data collected in accordance with '*Guide to determining terrestrial habitat quality, Version 1.3*' (DES 2020a), which was current at the time of the 2021 field surveys. These plots were primarily positioned in vegetation communities that will be directly impacted by the proposed disturbance footprint.

The targeted flora species surveys were undertaken in detail across the majority of the project site. Figure 8 identifies an area in the north-east of the project site that was not able to be comprehensively surveyed due to steep terrain limiting access to the area.

The location of each habitat quality plot, secondary, tertiary and quaternary flora assessment site is shown in Figure 3.

Additional flora surveys were also conducted outside the study area, but within the local area. The effort from the additional surveys is considered

relevant to this assessment and data gathered during these surveys has been considered in this assessment, particularly in relation to the likelihood of occurrence assessments.

The flora surveys culminated in ground truthed vegetation mapping. This ground truthed mapping was submitted to the Queensland Herbarium for validation as part of the response to DETSI's additional information request. The Herbarium validated vegetation map was used as the basis for this assessment (Figure 6).

- Fauna surveys were undertaken over 12 days in the early wet season 2017 (13 to 24 November, inclusive) and 15 days in the early dry season 2019 (24 April to 8 May, inclusive) and 3 days in the early dry season 2021 (accumulated between 27 April and 2 May 2021, inclusive). These surveys were conducted in accordance with various Queensland and Commonwealth fauna survey guidelines that were current at the time of the surveys, to detect/determine the likelihood of occurrence of various fauna species and determine the extent and quality of fauna habitat within the project site. Reference was also made to the '*Recommended Fauna Survey methodology for Environmental Impact Assessments*' (Freeman 2009). The field work consisted of systematic and supplementary survey sites and opportunistic observations and included:
 - Elliot traps: 840 trap nights
 - Pitfall traps: 112 trap nights
 - Funnel traps: 168 trap nights
 - Infrared cameras: 1,808 camera nights
 - Spotlighting: 82.5 person hours; comprised of 31 person hours (on foot) and 51.5 person hours from a slow moving vehicle
 - Call playback: 28 sessions
 - Bird surveys: 160 person hours; comprised of 70 person hours of morning bird surveys and 90 person hours of targeted water point surveys
 - Active searches: 42 person hours
 - Anabat recordings: 23 nights
 - Harp trap: 10 trap nights
 - 7 Koala transects (equating to 93 ha of Koala surveys)
 - 22 Spot Assessment Technique (SAT) sites.

Fauna surveys conducted in 2017 utilised Anabat Express detectors and were not full spectrum recorders. Surveys conducted in 2019, 2021 and 2024 utilised Anabat Swift full spectrum detectors with data analysed by Greg Ford. The 2019 survey used the detectors in both full spectrum mode and zero cross analysing mode with five of the nine sites in full spectrum mode. Therefore, a total of 13 Anabat sites (AB16, AB17 and AB20 to AB30

inclusive) were completed in full spectrum mode and 17 in zero cross analysis mode.

The settings of the Anabat Swift units in full spectrum mode were:

- Sample rate 500ksps
- Max file length 10s
- Trigger Frequency 10kHz to 250kHz
- Min event 2ms
- Trigger window 2s
- Sensitivity Generally set between 10 and 15 depending on wind and other background noise levels at each site

Analysis methodology provided by Greg Ford, the bat expert who conducted the project bat call analysis, is presented below:

Call analyses were performed in Anabat Insight, with all files passed through a Decision Tree analysis to exclude files containing only background noise and group detected bat-calls based on a combination of pulse characteristics, such as characteristic frequency (Fc), time between calls (TBC) and pulse curvature.

The preliminary call identities applied by the Decision Tree process were then confirmed or adjusted manually by comparing the call spectrograms and derived metrics with those of reference calls from central and northern Queensland and/or with published call descriptions (e.g. Reinhold et al. 2001). Consideration was also given to the probability of species' occurrence based on published distribution information (e.g. Churchill 2008; van Dyck et al. 2013) and on-line database records (e.g. <http://www.ala.org.au>).

The location of each fauna survey site is shown in Figure 4. Records of fauna on the project site were also made opportunistically while undertaking other activities during the survey such as driving between trap sites and supplementary survey sites (364 diurnal person hours and 32 nocturnal person hours).

Additional fauna surveys were also conducted outside the study area, but within the local area. The effort from the additional surveys is considered relevant to this assessment and data gathered during these surveys has been considered in this assessment, particularly in relation to the likelihood of occurrence assessments.

- Likelihood of occurrence assessments based on the species' known ranges, preferred habitat, and project site characteristics (Appendix D). This assessment culminated in MSES habitat mapping (Figures 8 and 9).
- Significant impact assessments undertaken in accordance with the current version of the SRI Guideline (EHP 2014a) (Appendix G).

The surveys were conducted in accordance with the recommended survey timing for the Gulf Plains Region in the *Queensland Terrestrial Vertebrate Fauna Survey Guidelines* (i.e. November to January and May to July). However, there were some limitations on the surveys, including drier conditions in the months prior to the early wet season fauna survey in 2017, leading to reduced grass cover and seed; and mild conditions during the early dry season survey in 2019, which may have affected fauna activity in the project site during the survey. Additionally, standing water was limited during both survey periods, to a small pool in the Woolgar River and the two farm dams.

Dry conditions were experienced leading up to the early wet season flora surveys, which resulted in a reduced level of observed flora species richness and plant vigor. However, the conditions during the early dry season flora surveys were good given the substantial rainfall in the months leading up to the 2016, 2019 and 2021 surveys.

Ecological surveys may fail to record all species of flora and fauna present in a study area for a variety of reasons, including seasonal absence, large home ranges, reduced activity or lack of reproductive material for flora during certain seasons. Furthermore, the ecology and nature of some significant and/or cryptic species means that such species are potentially not recorded during short survey periods. This assessment overcomes these limitations by assessing impacts not only on species recorded during the field surveys, but also on species that are assessed as potentially present (based on known distribution and habitat availability).

4 Results

This section provides the findings of both the desktop searches and the field survey results including the MSES that were recorded, or are likely to be present, within the project site.

The results of the desktop searches are provided in Appendix B and the species recorded within the site are detailed in Appendices E and F. Likelihood of occurrence assessments are provided in Appendix D.

4.1 Regulated vegetation

This section provides an overview of the regulated vegetation within the project site and the results of the desktop searches and field surveys.

4.1.1 Overview

The entire project site was found to support remnant least concern vegetation communities (i.e. approximately 2,281 ha). The regional ecosystems in the project site are shown on Figure 6. Disturbance observed within the project site mainly comprised cattle grazing, which has impacted the groundcover layer and resulted in localised erosion of heavily utilised areas and infestation of sections of the Woolgar River with Rubber Vine (**Cryptostegia grandiflora*) and Parkinsonia (**Parkinsonia aculeata*). There were other small areas of clearing and vehicle tracks most likely for historical timber acquisition and gold mining, and some small areas of clearing for drill pads and tracks associated with more recent exploration activity.

Other than the open sandy creek bed of the Woolgar River, the project site was generally characterised by sparse open *Eucalyptus* and *Corymbia* communities as detailed in Section 4.1.2 and Figure 6.

All of the watercourses and drainage lines in the project site are identified as vegetation management watercourses that intersect with mapped remnant vegetation.

4.1.2 VM Act listed communities

Approximately 2,281 ha of remnant vegetation comprising 14 REs has been mapped across the project site. Details of the REs are presented in Table 1 and associated mapping is shown on Figure 6. All of these remnant REs are listed as least concern under the VM Act and as such are not MSES under the EO Act. No of concern or endangered REs were identified within the project site.

Table 1: Regional ecosystems occurring in the project site

RE code	Short description (Queensland Herbarium 2021)	VM Act Status	Bio- diversity Status	Other	Area within the project site (ha)
2.3.21j	<i>Eucalyptus leptophleba</i> and/or <i>Corymbia polycarpa</i>	Least concern	Of concern	Sparse	218.0

RE code	Short description (Queensland Herbarium 2021)	VM Act Status	Bio- diversity Status	Other	Area within the project site (ha)
	and/or <i>C. confertiflora</i> woodland to open woodland on levees and active Quaternary alluvial plains of upper tributary watercourses in the east of the bioregion.				
2.3.26b	<i>Eucalyptus camaldulensis</i> woodland, commonly with <i>Melaleuca fluviatilis</i> . Occurs on fringes of major watercourses in the south- east of the bioregion on alluvial sands and loams.	Least concern	Of concern	Sparse - Riverine	50.8
2.3.40	<i>Eucalyptus microtheca</i> and/or <i>E. microneura</i> and/or <i>Lysiphyllum</i> spp. open woodland on active Quaternary alluvial plains.	Least concern	Of concern	Not a wetland. Sparse structural category	180.0
2.3.41	<i>Aristida dominii</i> , <i>Eriachne</i> spp., <i>Chloris lobata</i> +/- <i>Eragrostis basedowii</i> , <i>Iseilema</i> sp. tussock grassland on active Quaternary alluvial plains of major watercourses.	Least concern	Of concern	Not a wetland. Woody grassland structural category	52.3
2.3.50a	Bare sand and rock with scattered shrubs and patches of grasses, forbs and sedges. Occurs in the channels of major watercourses.	Least concern	Of concern	Other - Riverine	18.8
2.5.9	<i>Eucalyptus microneural</i> woodland on plains and plateaus on earths, podsolics and skeletal soils.	Least concern	No concern at present	Sparse	152.5
2.5.18a	<i>Corymbia setosa</i> low open woodland to woodland, commonly with <i>Erythrophleum</i> <i>chlorostachys</i> . Occurs on broad, gently undulating, Tertiary sand sheets in the south-east of the bioregion. Brown sands and sandy loams.	Least concern	No concern at present	Very sparse	387.3
2.5.20	<i>Eucalyptus similis</i> and/or <i>E.</i> <i>chartaboma</i> +/- <i>Erythrophleum</i> <i>chlorostachys</i> , <i>Corymbia</i> spp. woodland on undulating Tertiary sand sheets,	Least concern	No concern at present	Not a wetland. Sparse structural category	507.1

RE code	Short description (Queensland Herbarium 2021)	VM Act Status	Bio- diversity Status	Other	Area within the project site (ha)
	moderately high in the landscape.				
2.7.2a	<i>Eucalyptus microneura</i> low open woodland to low woodland. Occurs on low rises and outcrops of ferricrete.	Least concern	No concern at present	Not a wetland. Sparse structural category	79.3
2.10.1a	<i>Eucalyptus microneura</i> low open woodland to low woodland on plains and low rises of Mesozoic sandstone, commonly exposed by erosion of Tertiary outwash plains.	Least concern	No concern at present	Sparse	36.9
2.10.2x5a	<i>Corymbia serendipita</i> woodland to open woodland, commonly with a lower tree layer of <i>Acacia shirleyi</i> . Occurs on slopes, gullies and stepped scarps in Mesozoic sandstone ranges.	Least concern	No concern at present	Sparse	140.9
2.10.4	<i>Eucalyptus microneura</i> or <i>E. prosecta</i> +/- <i>Corymbia pocillum</i> open woodland on sandstone ranges.	Least concern	No concern at present	Not a wetland. Sparse structural category	89.5
2.10.13	<i>Eucalyptus crebra</i> or <i>E. whitei</i> low open woodland on slopes of sandstone ranges.	Least concern	No concern at present	Not a wetland. Very sparse structural category	12.5
2.11.1c	<i>Eucalyptus prosecta</i> low woodland, occasionally with <i>Corymbia pocillum</i> , <i>C. dallachiana</i> and <i>Eucalyptus microneura</i> . Occurs on steep Metamorphic footslopes. Skeletal, pale, sandy to pebbly soil.	Least concern	No concern at present	Sparse – Not a wetland	354.9
Total					2,280.7

4.1.3 Vegetation management watercourses

In accordance with the EO Act, remnant REs that occur within certain distances of watercourses are classified as MSES.

A number of Queensland Government mapped vegetation management watercourses dissect the project site, all of which intersect with remnant

vegetation (Figure 7). Appendix 3 of the Queensland Environmental Offsets Policy (QEOP), lists the following defined distances for measuring regulated vegetation near watercourses in non-coastal bioregions, in which the assessment area is located:

- stream order 1 or 2 = 25 m from the defining bank
- stream order 3 or 4 = 50 m from the defining bank
- stream order 5 or greater = 100 m from the defining bank (DES 2020b).

Impacts within these defined distances for remnant watercourse vegetation is discussed in Section 5.1 and Appendix G.

4.1.4 Vegetation management wetlands

There are no vegetation management wetlands mapped within the project site. Therefore, impacts to vegetation management wetlands are not considered further in this report.

Two of the REs within the project site are recognised as riverine REs in their descriptions, although none are lacustrine (large, open, water-dominated systems larger than 8 ha, e.g. lakes) (Queensland Herbarium 2021). RE 2.3.26b is a riverine community that may support an occasional depression that holds water for an extended period of time but is not a wetland. Similarly RE 2.3.50a may support small pools that persist following flow events, however there is a low likelihood of water persisting for extended periods. Neither of these REs is defined as a wetland under the EO Act and as such are not MSES under the EO Act.

4.1.5 Biodiversity planning assessment mapping

Mapped remnant vegetation associated with the Woolgar River corridor is identified as supporting state significant biodiversity values. Remaining remnant vegetation within the project site has been identified as having regional or local biodiversity value (Figure 5). Additionally, the Woolgar River has been identified as a state significant riparian corridor. This mapped corridor extends into the central-western and northern extent of the project site (Figure 5).

4.2 Flora

This section provides an overview of the flora species present within the project site and the results of the desktop searches and field surveys including NC Act threatened and near threatened flora and exotic flora.

4.2.1 Overview

A total of 350 flora species were recorded within the project site during the surveys. This included 315 (90%) native species and 35 (10%) exotic species, representing 68 families and 191 genera. The dominant family groups included Poaceae, Fabaceae, Myrtaceae, Malvaceae, Mimosaceae, Cyperaceae and Convolvulaceae. The results of the surveys are listed in Appendix E where the flora inventories for each site have been grouped into their respective RE type. Detailed floristic inventories were collated for each RE at the location of habitat quality plots and secondary vegetation assessment sites.

4.2.2 Threatened and near threatened flora

No dual listed MSES flora species were identified within the project site during the field surveys, and none are considered likely to occur within the project site. No high-risk areas are mapped within or adjacent to the project site on the Queensland Government's Protected Plants Flora Survey Trigger Map.

Of the residual NC Act threatened and near threatened flora species returned from database searches, one vulnerable and one near threatened species, *Drummondita calida* and *Labichea brassii* respectively, are considered to potentially occur in the project site (Appendix D). In addition to these species, another near threatened species, *Leptospermum pallidum* (no common name), was identified approximately 300 m east of the project site and suitable habitat for this species was identified in the project site.

Near threatened species are not listed as MSES under the EO Act and therefore, *Labichea brassii* and *Leptospermum pallidum* have not been considered further in this assessment. However, Protected Plant Clearing Permits may be required for any clearing of or near these species under the *Nature Conservation (Plants) Regulation 2020*.

No other NC Act listed threatened flora species are considered likely to occur in the project site. *Drummondita calida* is discussed in the following section.

Drummondita calida

Species profile

Drummondita calida is listed as vulnerable under the NC Act. This is a highly restricted shrub that occurs in north Queensland between Bulleringa National Park (located between Chillagoe and Georgetown) and the southern end of the Gregory Range (Duretto 2018; Wilson 2013). The species is known to occur in very exposed and sparse low shrubland on bare sandstone plateaux, to low open woodlands on sandstone with large boulders (Duretto 2018; Wilson 2013).

Queensland Government essential habitat factors for this species describe preferred habitat as comprising:

- vegetation community - thicket of *Acacia shirleyi*; woodland of *Eucalyptus* spp. and *Acacia* spp.; woodland of *Eucalyptus whitei*, *Corymbia serendipita*, *C. setosa* with *Grevillea decora*, *Calytrix* sp., *Triodia* sp. and *Acacia lazaridis*
- altitude - 200 to 700 m
- soils - shallow
- position in landscape - low rocky hill, laterised sandstone ridge (DR 2021).

Presence and habitat

MODERATE (refer Appendix D)

No individuals of *Drummondita calida* were recorded within the project site or during other surveys of areas to the east of the project site. Potential habitat for this species is present in the project site in the form of woodland comprised of Newcastle Range Bloodwood (*Corymbia serendipita*) and Darwin Woollybutt (*Eucalyptus miniata*) on the sandstone scarps located throughout the north-east of the project site (i.e. RE 2.10.2x5a) (Figure 8). A portion of potential habitat for this species had steep terrain and therefore comprehensive searches for the species were difficult due to limited access (Figure 8). Detailed searches of the areas of potential habitat outside of this area were completed including all areas within the project disturbance footprint.

The nearest known record of this species is approximately 25 km east, north-east of the project site from 2004 (CSIRO 2022). This species is a relatively conspicuous shrub that is up to approximately 2.5 m in height with small, tightly held foliage. Therefore, it is considered likely that it would have been identifiable from some distance and is considered very unlikely to be present within the project disturbance footprint. Any large populations of this species are considered likely to have been very conspicuous during the field survey if present, even in the area that was not comprehensively surveyed due to access constraints. However, the presence of a small number of scattered individuals within the area that was not comprehensively surveyed due to steep terrain/access limitations, cannot be ruled out.

A total of 140.9 ha of potential habitat for this species has been identified along the north-eastern edge of the project site in association with the edge of the Gregory Range that extends into the project site (Figure 8).

4.2.3 Exotic flora

A total of 35 exotic flora species were recorded in the project site during the field surveys. Three of these exotic flora species; Rubber Vine (**Cryptostegia grandiflora*), Prickly Acacia (**Vachellia farnesiana*) and Parkinsonia (**Parkinsonia aculeata*), are listed Category 3 restricted invasive plants under Queensland's *Biosecurity Act 2014*. Rubber Vine and Parkinsonia are also listed recognised as 'Weeds of National Significance' (WoNS). The ranking criteria for WoNS are based on assessments of a weed's invasiveness, economic, social and environmental

impacts, the potential for spread and socio-economic impacts (such as impacts on health, fire risk, and recreational values of land), and environmental values. There is no legislated requirement for the control of WoNS – this task is primarily a state and local government responsibility.

The distribution of these species is presented in Figure 6. This figure is indicative of the distribution of these restricted weeds but is not intended to provide a comprehensive assessment of the distribution and density of these species.

The remaining exotic species recorded in the assessment area are non-restricted under the Biosecurity Act. Exotic grasses occasionally occur in low abundance on lower slopes and alluvial areas and Flannel Weed (**Sida cordifolia*), Red Natal Grass (**Melinis repens*), Spiked Malvastrum (**Malvastrum americanum*) and Star Burr (**Acanthospermum hispidum*) were more regularly recorded, primarily in alluvial communities in low densities in the project site.

4.2.4 Connectivity areas

Connectivity areas are defined under the EO Act as –

A patch of land is considered a connectivity area when:

- *the area is of sufficient size or configured in a way that maintains ecosystem functioning; and*
- *the regional ecosystem will remain despite a threatening process within the meaning of the section 12 of the NC Act.*

Only remnant (i.e. Category B) REs are considered to contribute to connectivity areas. Remnant vegetation in the project site (Figure 6) contributes to connectivity areas in the landscape, and the project site is located in an intact landscape. Section 4.1.6 discusses the ecological corridors present within the project site.

4.3 Fauna

This section provides an overview of the various types of fauna habitat present within the project site and the results of the database searches and field surveys for NC Act listed fauna including both threatened and near threatened fauna and feral animals.

4.3.1 Fauna habitat overview

Fauna habitat throughout the project site was typically in good condition, with some exotic grass infiltration on lower slopes and alluvial areas where there is greater water availability and more cattle. Some areas displayed the effects of historical intense fires.

Remnant vegetation covers the project site, which can be divided into the following broad habitat types based on the broad vegetation groups mapped within the project site (refer Table 1 and shown on Figure 6):

- Riparian woodland, natural levees and associated river beds (REs 2.3.50a, 2.3.26b, 2.3.21j, 2.3.40 and 2.3.41) that are associated with the Woolgar River and drainage lines in the project site. These habitats support large River Red Gum (*Eucalyptus camaldulensis*) on the banks and levees with low thickets of vegetation within the stream channel and occasional ponding in the dry season. Condition was variable and canopy discontinuous in some areas. Large infestations of Rubber Vine were observed along the river banks in places.
- Open woodlands dominated by eucalypts and *Corymbia* species (REs 2.5.9, 2.5.18a, 2.5.20, 2.7.2a and 2.10.1a) on the flatter ground between the plateaus and the ridgelines and the Woolgar River. There are some large hollow-bearing trees, a variable shrub layer and generally native ground layer, with Spiked Malvastrum more prominent in some areas. Some grazing pressure was observed in this community.
- Low woodland to tall shrubland dominated by *Acacia* species (RE 2.10.2x5a), which occurred on slopes and plateaus on the edge of sandstone escarpment in the east of the project site. The condition of this community was good, with negligible weed presence, large mature trees prevalent (some hollow-bearing) and some areas of rocky outcropping. Some exploration disturbance in the form of drill tracks and pads was observed in this habitat type.
- Open eucalypt woodlands (REs 2.10.4, 2.10.13 and 2.11.1c), on steep slopes on granitic and metamorphic ranges in the east of the project site, dissected by gully lines, large trees and negligible weed infiltration. Some patchiness in the canopy and exploration disturbance was observed.

4.3.2 Threatened and special least concern fauna

A total of 175 species of terrestrial vertebrate fauna, including 5 introduced species were recorded during the fauna surveys comprising: 103 species of birds, 9 amphibians, 30 reptiles and 33 mammals (including 20 microchiropteran bats). A complete species list for the survey is provided in Appendix F.

Seventeen fauna species listed as threatened under the NC Act were returned from database searches (Table C4, Appendix C). Two of these threatened fauna species were recorded within the project site during the fauna surveys, namely: Squatter Pigeon (Southern) (*Geophaps scripta scripta*) and Koala (*Phascolarctos cinereus*).

There is no essential habitat mapping or Critical Habitat for NC Act listed fauna species within the project site. The project site is not located in a Koala District and there are no Koala habitat areas mapped within the project site.

Twelve bird species listed as special least concern-migratory under the NC Act and a number of marine/oceanic species (i.e. whales, turtles, oceanic birds etc.) were also returned from database searches. Marine/oceanic species (i.e. whales, turtles, oceanic birds etc.) were not considered as part of this assessment, given the project site is located more than 400 km inland from the coast and does not support any marine or intertidal habitats. Special least concern migratory species are not listed as MSES under the EO Act and therefore, have not been considered further in this assessment.

All of the fauna species returned from database searches, including the threatened species identified in the project site, are also listed as threatened under the EPBC Act and have therefore been addressed in the separate MNES assessment report (Eco Solutions & Management 2022). These species, along with a description of their preferred habitat and likelihood of occurrence within the project site, are outlined in Appendix D. No other threatened fauna listed under the NC Act occur or have the potential to occur in the project site, therefore threatened fauna have not been addressed further in this MSES report.

One fauna species listed as special least concern under the NC Act, namely the Short-beaked Echidna, was returned from database searches (Section C4.3, Appendix C). This species is the only residual MSES fauna species considered further in this assessment. The Short-beaked Echidna was identified in the project site during the surveys. Its preferred habitat and occurrence within the assessment area is provided in the following section and Appendix D.

Short-beaked Echidna

Species overview

The Short-beaked Echidna is listed as near threatened under the NC Act and occurs in almost all terrestrial habitats except intensively management farmland. It shelters in logs, crevices, burrows or piles of litter and feeds on ants, termites and other soil invertebrates, particularly beetle larvae (Menkhorst and Knight 2011).

Presence and habitat

PRESENT (refer Appendix D)

This species was recorded at three locations, via scats and during spotlighting activities, in the project site during the seasonal fauna surveys (Figure 9).

This species occurs in a wide range of habitats including cleared and grazing land and is likely to occur throughout the project site. Approximately 2,281 ha of habitat is mapped within the project site (Figure 9).

4.3.3 Feral animals

Five feral animal species were recorded during the field surveys in the project site (Appendix F). These species are listed under the Queensland *Biosecurity Act 2014*¹. Table 2 provides a description of the presence of feral animals in the project site.

Table 2: Feral animals in the project site

Species	<i>Biosecurity Act 2014</i> ¹	Abundance and occurrence in the project site
Cane Toad (* <i>Rhinella marina</i>)	GBO	The Cane Toad was recorded at one systematic trap site and five supplementary sites in the project site.
Dingo/Wild Dog (* <i>Canis lupus dingo</i>)	Restricted (Categories 3, 4, 5 and 6)	This species was recorded spotlighting at one supplementary site, a water survey point, and was recorded incidentally throughout the project site.
European Rabbit (* <i>Oryctolagus cuniculus</i>)	Restricted (Categories 3, 4, 5 and 6)	This species was recorded at one supplementary site and infrequently on long-term infra-red cameras in the project site.
Feral Cat (* <i>Felis catus</i>)	Restricted (Categories 3, 4 and 6)	Feral Cats were recorded infrequently on long-term infra-red cameras and incidentally during survey activities.
Feral Pig (* <i>Sus scrofa</i>)	Restricted (Categories 3, 4 and 6)	Pig scats were recorded at one trap site, as well as while active searching at two supplementary site and often while spotlighting during drive transects. This species was also captured regularly on long-term infra-red cameras throughout the project site, often in groups.

¹ GBO – a general biodiversity obligation exists for this species under the Biosecurity Act
Restricted – the species is a restricted invasive animal for which specific restrictions are in place

4.4 Summary of residual MSES

Based on the desktop and field surveys undertaken for the project, the following residual MSES have been identified in the project site:

- regulation vegetation: REs within the defined distance from the defined banks of a relevant watercourse (Figure 7)
- protected wildlife habitat: 140.9 ha of potential habitat for vulnerable *Drummondita calida* (Figure 8)
- protected wildlife habitat: 2,281 ha of habitat for special least concern Short-beaked Echidna (Figure 9)
- connectivity areas: 2,281 ha of remnant vegetation (Figure 6).

As discussed in Section 4.3.2, the following dual listed MSES have been considered as part of the MNES assessment:

- protected wildlife habitat for an animal that is endangered or vulnerable wildlife, including the Koala and Squatter Pigeon, which were recorded in the project site.

The following MSES do not occur within the project site:

- regulated vegetation: endangered and of concern REs or REs that intersect with a vegetation management wetland or essential habitat
- a high risk area (HRA) on the flora survey trigger map
- essential habitat areas on the essential habitat map
- a koala habitat area
- a designated precinct in a strategic environmental area
- protected areas
- legally secured offset area.

As discussed in Section 2.5, the following MSES are discussed in the EAR Aquatic Ecology Report: wetlands in a WPA or HES wetlands as shown on the map of referable wetlands or in HEV waters.

5 Impact assessment and mitigation

Project activities have the potential to impact vegetation communities and fauna habitat through:

- direct impacts from vegetation clearing of proposed mining areas, infrastructure areas
- indirect impacts such as the effects of fragmentation, noise and vibration, vehicle strike, light, dust, erosion and sedimentation, and invasive species
- cumulative impacts.

These impacts, and associated mitigation measures, are described in this section as are the significance of these impacts on residual MSES. The requirements for offsets are also discussed in this section.

5.1 Direct impacts

Vegetation clearing is required for the construction of the mine and mine infrastructure (Figure 6). The proposed clearing area is shown on Figures 6 to 9. The impacts to MSES present or potentially present in the project site, and the significance of the impact, are summarised in Table 3.

Assessments of the significance of project impacts on MSES that were identified or considered likely to occur in the project site are provided in Appendix G. These impact assessments consider the direct, indirect, and cumulative impacts and avoidance, mitigation, and management measures. The assessments were undertaken in accordance with the Queensland SRI Guideline (EHP 2014a). Guidelines and policies produced by the Queensland have been referred to, where available, to assist in determining the significance of impacts. Section 2.1 of the Queensland SRI Guideline is specifically used in the determination of the significant residual impacts to regulated vegetation.

Measures to reduce the direct impacts to vegetation and habitat are discussed in Section 5.1.1 and 5.1.2.

Table 3: Direct impacts to residual MSES

MSES	Status ¹	Likelihood of occurrence	Area in the project site (ha)	Area to be cleared ² (ha)	Significant Impact (Y/N)
Regulated vegetation*					
Watercourse RE 2.3.21j	LC	Present	43.2	7.6	Y
Watercourse RE 2.3.26b	LC	Present	37.4	14.1	Y
Watercourse RE 2.3.40	LC	Present	35.0	7.3	Y
Watercourse RE 2.3.41	LC	Present	9.5	2.7	N
Watercourse RE 2.3.50a*	LC	Present	18.8	0.0	N

MSES	Status¹	Likelihood of occurrence	Area in the project site (ha)	Area to be cleared² (ha)	Significant Impact (Y/N)
Watercourse RE 2.5.9	LC	Present	5.0	2.2	Y
Watercourse RE 2.7.2a	LC	Present	0.9	0.9	N
Watercourse RE 2.10.1a	LC	Present	6.3	0.5	N
Watercourse RE 2.10.2x5a	LC	Present	3.0	0.8	N
Watercourse RE 2.10.4	LC	Present	4.1	0.8	N
Watercourse RE 2.10.13	LC	Present	0.3	0.0	N
Watercourse RE 2.11.1c	LC	Present	23.4	5.4	Y
<i>Protected wildlife habitat</i>					
<i>Drummondita calida</i>	V	Moderate	140.9	13.8	N
Short-beaked Echidna	SL	Present	2,280.7	1,340.6	N
<i>Connectivity areas</i>	LC	Present	2,280.7	1,340.6	N

¹ NC Act Status: V – vulnerable, SL – special least concern; VM Act status: LC – least concern

² Mapping of the defining banks is only available for the Woolgar River within the project site. Therefore, the vegetation management watercourse centreline has been used to develop buffers for 1st, 2nd and 3rd order streams.

* RE 2.3.50a is mapped as part of a mixed polygon within the project site. However, no clearing of the bed of the Woolgar River (i.e. where this community occurs) is proposed. Therefore, all clearing within this mixed polygon has been attributed to RE 2.3.26b, which occurs on the banks of the Woolgar River.

Approximately 1,341 ha of remnant vegetation will be required to be cleared for the project. Figure 6 illustrates the conceptual clearing footprint in relation to remnant vegetation. The area of clearing proposed for the remnant REs recorded in the project site, accounts for approximately 0.2% of the extent of these REs in the Gilberton Plateau and Claraville Plains subregions.

Although the project will result in the removal of areas of MSES habitat, substantial similar connected habitat will remain within the project site and elsewhere in the region.

5.1.1 Measures to avoid impacts

The project has been designed to minimise the disturbance area to the necessary amount required to conduct safe mining operations with sufficient operating room. It has also been designed to ensure that the disturbance of the pump station on the Woolgar River is as small as possible to minimise impacts to the Woolgar River riparian zone.

5.1.2 Measures to mitigate and manage impacts

A range of procedures will be implemented during project construction, operation and rehabilitation that will mitigate and manage potential impacts to MSES. The key mitigation and management measures are summarised in the following sections.

Permit to Disturb

Clearing will be undertaken in accordance with a Permit to Disturb procedure. The procedure will require that approval is obtained from the environmental officer prior to the commencement of any clearing. The Permit to Disturb procedure will ensure that any clearing is compliant with the relevant requirements of the EPBC Act approval and Environmental Authority and that pre-clearing and clearing activities are conducted in an appropriate and approved manner. Where appropriate, pre-clearing and clearing requirements will be included in a species management program (SMP), approved by the Queensland Government under the Queensland *Nature Conservation Act 1992* (NC Act). The Permit to Disturb will include the following requirements:

- checking that proposed clearing is compliant with the approved clearing limits/locations specified in the EPBC Act approval and Environmental Authority
- delineation of the approved clearing area prior to clearing (i.e. using survey pegs or flagging tape) to minimise the risk of unauthorised clearing
- pre-clearance surveys conducted by a spotter catcher as appropriate to confirm the presence of any listed threatened fauna species and any animal breeding places. If listed threatened fauna species or breeding places are detected, the spotter catcher will try to relocate fauna prior to the commencement of clearing. If this is not achievable, during clearing the spotter catcher will be present to ensure that additional clearing controls are implemented (e.g. trees with nests/hollows are nudged with a dozer or similar equipment prior to being felled to try and flush animals from the tree, and a spotter catcher is present when trees with nests/hollows are felled to ensure that any injured/trapped animals are safely handled). The spotter catcher will also provide advice in relation to the direction habitat trees should be felled, how hollows are handled and if felled timber should be left, retained or relocated to re-instate fauna habitat
- compliance with the *Queensland Guideline: Activities in a Watercourse, Lake or Spring Associated with a Resource Activity or Mining Operations* for clearing in riparian zones.
- implementation of any necessary erosion and sediment control works in accordance with the project Erosion and Sediment Control Plan
- maintenance of records for cleared areas and any species found during the pre-clearing/clearing process
- identification and definition of the roles and responsibilities of employees, in relation to clearing activities

- three yearly reviews of the Permit to Disturb, or immediately after an amendment to a key approval, to ensure compliance with the EPBC Act approval and Environmental Authority and to ensure that the Permit to Disturb process is effective.

Rehabilitation

The EAR Section – Mine Rehabilitation and Closure and the EAR Progressive Rehabilitation and Closure Plan outlines the specific procedures for mine rehabilitation, including monitoring of rehabilitation areas to ensure success.

5.1.3 Biodiversity offsets

Biodiversity offsets are required under the EO Act if an action is likely to give rise to a significant residual impact on MSES. The QEOP (DES 2022) details requirements under the EO Act in relation to biodiversity offsets. The Queensland SRI Guidelines (EHP 2014a) provides guidance to assist with determining whether a residual impact is considered significant.

The assessments of significance are provided in Appendix G and describe and assess the project's potential impacts on MSES. The findings are summarised in Table 4. These assessments conclude that there is potential for the project to have a significant residual impact on watercourse vegetation. Offsets under the EO Act are therefore required for impacts to watercourse REs 2.3.21j, 2.3.26b, 2.3.40, 2.5.9 and 2.11.1c.

Table 4: Summary of impacts to residual MSES and offset requirements

MSES	Status ¹	Likelihood of occurrence	Area in the project site (ha)	Area to be cleared ² (ha)	Significant Impact (Y/N)	Offsets required (Y/N)
Regulated vegetation*						
Watercourse RE 2.3.21j	LC	Present	43.2	7.6	Y	Y
Watercourse RE 2.3.26b	LC	Present	37.4	14.1	Y	Y
Watercourse RE 2.3.40	LC	Present	35.0	7.3	Y	Y
Watercourse RE 2.3.41	LC	Present	9.5	2.7	N	N
Watercourse RE 2.3.50a*	LC	Present	18.8	0.0	N	N
Watercourse RE 2.5.9	LC	Present	5.0	2.2	Y	Y
Watercourse RE 2.7.2a	LC	Present	0.9	0.9	N	N
Watercourse RE 2.10.1a	LC	Present	6.3	0.5	N	N
Watercourse RE 2.10.2x5a	LC	Present	3.0	0.8	N	N
Watercourse RE 2.10.4	LC	Present	4.1	0.8	N	N
Watercourse RE 2.10.13	LC	Present	0.3	0.0	N	N
Watercourse RE 2.11.1c	LC	Present	23.4	5.4	Y	Y
Protected wildlife habitat						
<i>Drummondita calida</i>	V	Moderate	140.9	13.8	N	N
Short-beaked Echidna	SL	Present	2,280.7	1,340.6	N	N

MSES	Status¹	Likelihood of occurrence	Area in the project site (ha)	Area to be cleared² (ha)	Significant Impact (Y/N)	Offsets required (Y/N)
Connectivity areas	LC	Present	2,280.7	1,340.6	N	N

¹ NC Act Status: V – vulnerable, SL – special least concern; VM Act status: LC – least concern

² Mapping of the defining banks is only available for the Woolgar River within the project site. Therefore, the vegetation management watercourse centreline has been used to develop buffers for 1st, 2nd and 3rd order streams.

* RE 2.3.50a is mapped as part of a mixed polygon within the project site. However, no clearing of the bed of the Woolgar River (i.e. where this community occurs) is proposed. Therefore, all clearing within this mixed polygon has been attributed to RE 2.3.26b, which occurs on the banks of the Woolgar River.

5.2 Indirect impacts

Indirect impacts have the potential to impact vegetation communities and fauna habitat and are discussed in the following sections.

5.2.1 Habitat fragmentation and edge effects

Vegetation clearing can result in the fragmentation of habitat and edge effects, which can impact flora and fauna species.

Clearing for the project has the potential to fragment fauna habitat and create barriers (i.e. cleared corridors), which may impair movement of some species, and impact connectivity of habitat. Clearing for the project also has the potential to create edge effects that infiltrate retained vegetation areas adjacent to cleared areas. However, due to the sparse and open nature of the woodland communities within the project site, edge effects are likely to be 'tempered' in comparison with the impacts of edge effects to denser, closed structure communities.

Overall, the impacts of fragmentation and edge effects from clearing for the project are unlikely to be significant due to the management and mitigation measures detailed in Section 5.1.1 and 5.1.2. The open characteristics of the woodland communities present, the extent of connected habitat remaining in the region, and the continued availability of riparian corridors along the Woolgar River for dispersal of more sensitive fauna, such as Koalas, also mitigate potential impacts from fragmentation and/or edge effects.

5.2.2 Noise and vibration

In general, construction and mining activities have the ability to generate noise and vibration, through vegetation clearing, operation of infrastructure, mine blasting and vehicle movements.

Most fauna exhibit a high degree of adaptability to machinery noise, however, some species may exhibit behavioural modifications (e.g. not feeding in an area with loud, sustained noise). The type of behavioural modification depends on the species and the type of noise (i.e. continuous noise or sudden loud noise). It is

not possible to quantify the proportion of the local fauna community that would be adversely affected by noise and vibration from the project, but it is expected to be a minority of species, and the impacts to fauna are unlikely to occur over a significant distance from the noise or vibration source.

In addition, native fauna is likely to return to noise and vibration affected habitat areas within a short period of time once the noise emissions cease.

Noise and vibration are, therefore, unlikely to significantly impact fauna.

5.2.3 Vehicle strike

The movement of mine vehicles on access roads and haul roads has the potential to result in injury or mortality of fauna. Ground-dwelling fauna are most susceptible to this impact, although birds and micro-bats may also be impacted.

The mine haul roads and access roads will be within a much larger cleared area and away from any remaining habitat. There is, therefore, a reduced likelihood that ground-dwelling fauna will be present on the mine roads and interact with any mine vehicles. The vibration of approaching haul trucks may also provide animals with warning and prompt fauna to move away from the path of approaching vehicles.

The mine site will be subject to speed limits and safe driving practices, whereby the speed limit for conventional and mine vehicles within the mine site will be a maximum 80 km/hour. Relevant signage, safe driving procedures and staff inductions will also be used to increase awareness of and minimise impacts from vehicle strikes. Vehicle strike is therefore unlikely to significantly impact fauna.

5.2.4 Lighting

Potential impacts of light spill from lighting associated with the project is likely to be limited and restricted to the external mine infrastructure areas and WRD operating areas.

Many species are able to adapt to altered environmental conditions over small areas, such as those created by lighting around proposed infrastructure areas. The impacts from lighting are, therefore, unlikely to significantly impact fauna.

5.2.5 Dust

Mining activities and the use of heavy equipment (e.g. trucks on unsealed haul roads) will generate dust. Dust generation will be reduced through implementing dust controls, such as:

- watering haul roads and active mining and waste rock dumping areas
- undertaking progressive rehabilitation.

Recent studies on the impacts of dust from unsealed roads on vegetation and fauna have found no evidence that dust has any detrimental impacts on vegetation or fauna abundance (Cumberland Ecology 2015; Jones et al. 2016). Furthermore, with the proposed dust mitigation measures, generation of dust is expected to be

limited. Dust related impacts will be relatively minor and are therefore, not likely to cause a significant impact on the ecological values of the project site.

5.2.6 Erosion and sedimentation

The project has the potential to result in erosion of disturbed areas within the project site through the clearing of vegetation for construction of project infrastructure and mining.

The development and implementation of an Erosion and Sediment Control Plan over the life of the project will be a requirement of the Environmental Authority. It will outline methods and strategies to control soil erosion and minimise sediment transport. With the implementation of appropriate measures, it is unlikely that erosion will significantly affect vegetation or fauna within the project site.

5.2.7 Pest animals and plants

Weed diversity and abundance is relatively low within the project site as the area is remote and conditions are very dry during the majority of the year, which prevent weeds from becoming established and spreading. Nonetheless, the region has a history of minor disturbance and cattle grazing and as a result, WoNS and state restricted flora species listed under the Biosecurity Act are present in the landscape, including within the project site. Introduced plants were primarily recorded along the Woolgar River in the form of infestations of Rubber Vine and Parkinsonia, which are restricted invasive species and WoNS.

A number of introduced animals were identified in the project site as described in Section 4.3.3. While vegetation clearing activities may temporarily attract some predatory feral animals, it is unlikely that the project would introduce new feral animals to the project site or exacerbate existing impacts of feral animals in the project site. This is due to the highly mobile nature of the pest animals that are already likely to occupy and move freely within the region and colonise new areas. Nonetheless, there is a risk of weed and pest invasion in new areas or by new species, including restricted invasive species and WoNS, in the project site and therefore, management of weeds and pests will be a key aspect of the Weed and Pest Management Program. Measures that will be included in the Weed and Pest Management Program will include, but not be limited to:

- delivering education and awareness training about weeds and pest animals to all staff and contractors through mine site inductions
- weed wash-down procedures for vehicles moving between areas known to contain weeds and areas free of weeds
- development and maintenance of a site-wide weed register to capture weed infestation data and weed treatment activities that are undertaken
- development of a monitoring program for early detection of weed spread or introduction of new weeds
- design and implementation of an appropriate treatment control program for weed species as required

- consultation with relevant stakeholders, such as local government and adjacent property owners regarding feral animal management, if required.

5.2.8 Altered fire regime

The project has the potential to alter the existing fire regime of the project site through the introduction of weeds which in turn increases biomass. Variation in biomass is the main factor contributing to altered fire regimes in dry climates such as the climate in which the study area is situated (Bradstock 2010). Climate change may also change the frequency and duration of fire weather (Bradstock 2010). An increase in fire frequency or intensity may result in the removal of important fauna habitat features (i.e. mature vegetation, fallen logs, tree hollows).

Fires, and alterations to the existing fire regime, will be managed via water trucks with fire fighting capabilities and an emergency response plan to deal with fires should they occur on the project site. If site operations were to result in the ignition of a fire, it is expected that it would be controlled relatively quickly before it spread to areas of potential habitat. With the implementation of these measures, it is unlikely that an altered fire regime will develop or significantly affect vegetation or fauna within the project site.

5.3 Cumulative impacts

The project will result in clearing of up to approximately 1,341 ha of remnant REs and fauna habitat. This impact needs to be considered in conjunction with other clearing in the bioregion, including for other mining developments.

There are no mining projects adjacent to or within the area surrounding the project site. There are very few mining projects in operation or proposed for the entire Gulf Plains bioregion. Impacts to remnant vegetation from activities in the region surrounding the project, particularly in the form of direct clearing, are negligible. Any clearing that does occur is most likely thinning and land management for grazing activities.

The proponent will provide offsets for significant impacts to MNES and residual MSES. With the application of offsets, the project will not have a significant residual impact on biodiversity values. This will mean that, overall, the project is unlikely to contribute to significant adverse cumulative impacts on biodiversity values in the bioregional landscape.

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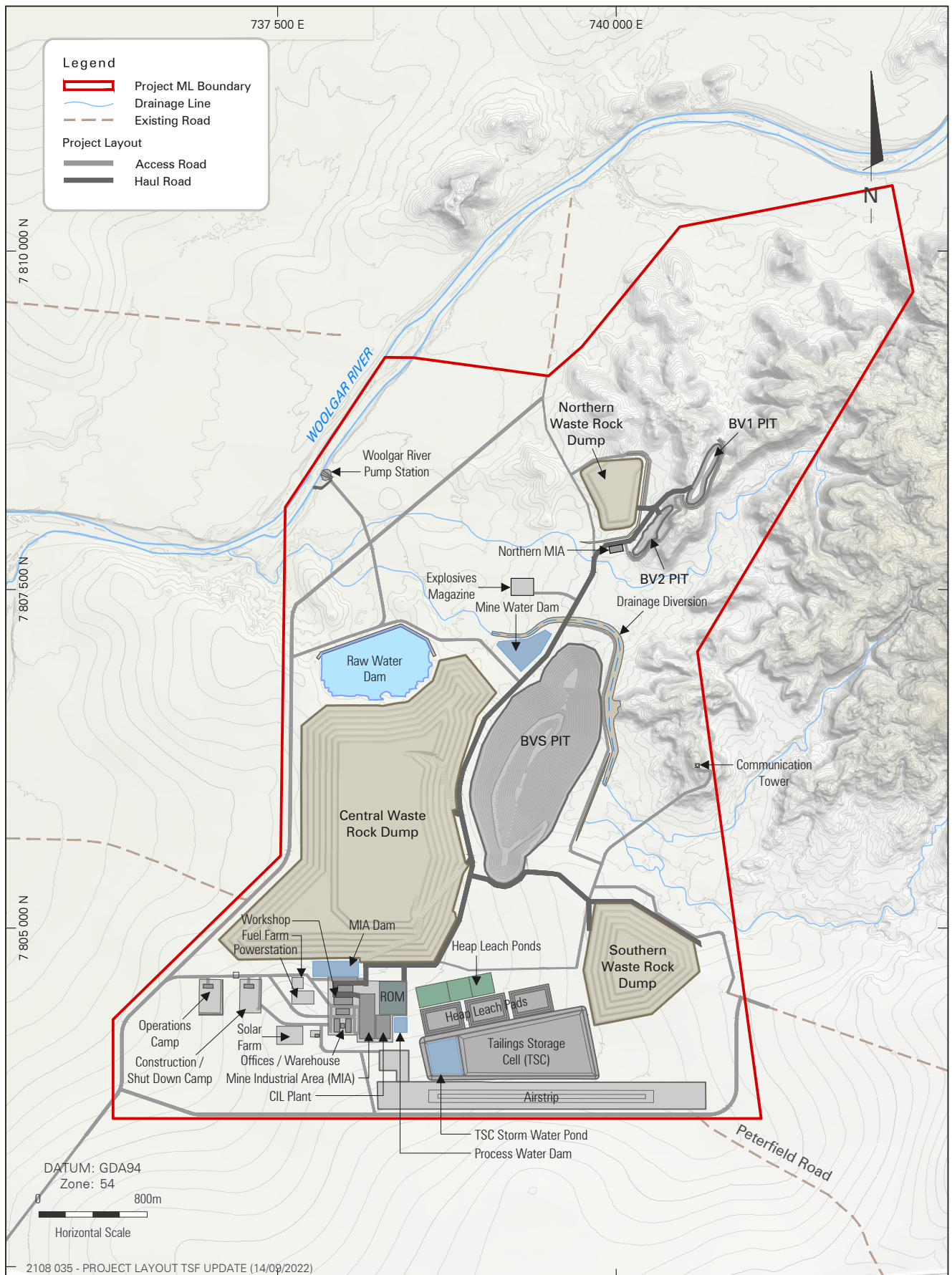
Figures



BIG VEIN SOUTH GOLD PROJECT

Location Plan

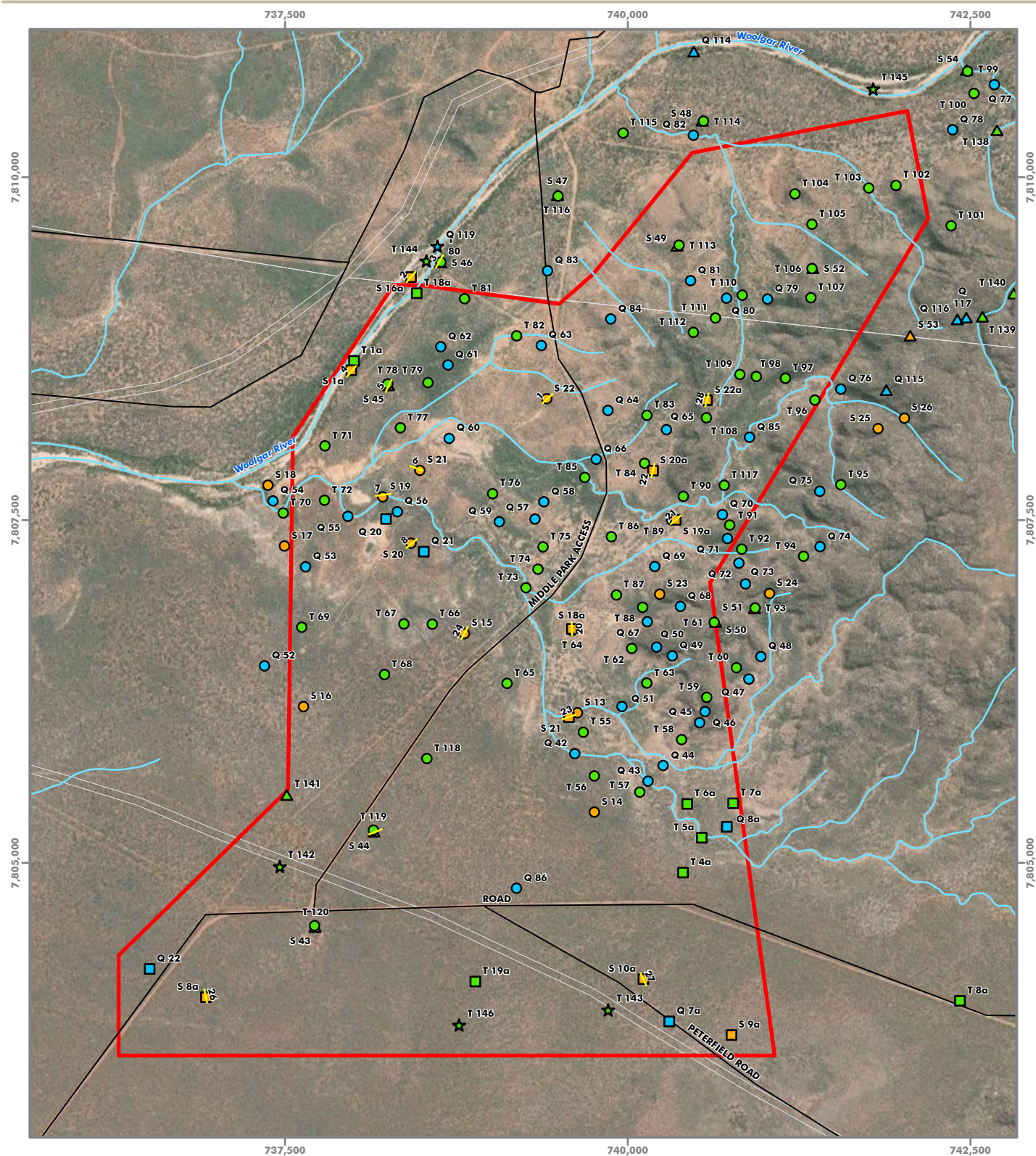
FIGURE 1



BIG VEIN SOUTH GOLD PROJECT

Project Layout

FIGURE 2



Legend

 Project site

Road

Vegetation Management Act watercourse

Cadastral boundary

Vegetation sites (Nov 2015)

● Secondary site

● Quaternary site

● Tertiary site

Vegetation sites (April 2016)

▲ Secondary site

▲ Tertiary site

▲ Quaternary site

Vegetation sites (Nov 2017)

★ Quaternary site

★ Tertiary site

Vegetation sites (April 2021)

■ Secondary site

■ Tertiary site

■ Quaternary site

— Habitat quality plot

Figure 3 : Vegetation assessment sites

Big Vein South Gold Project

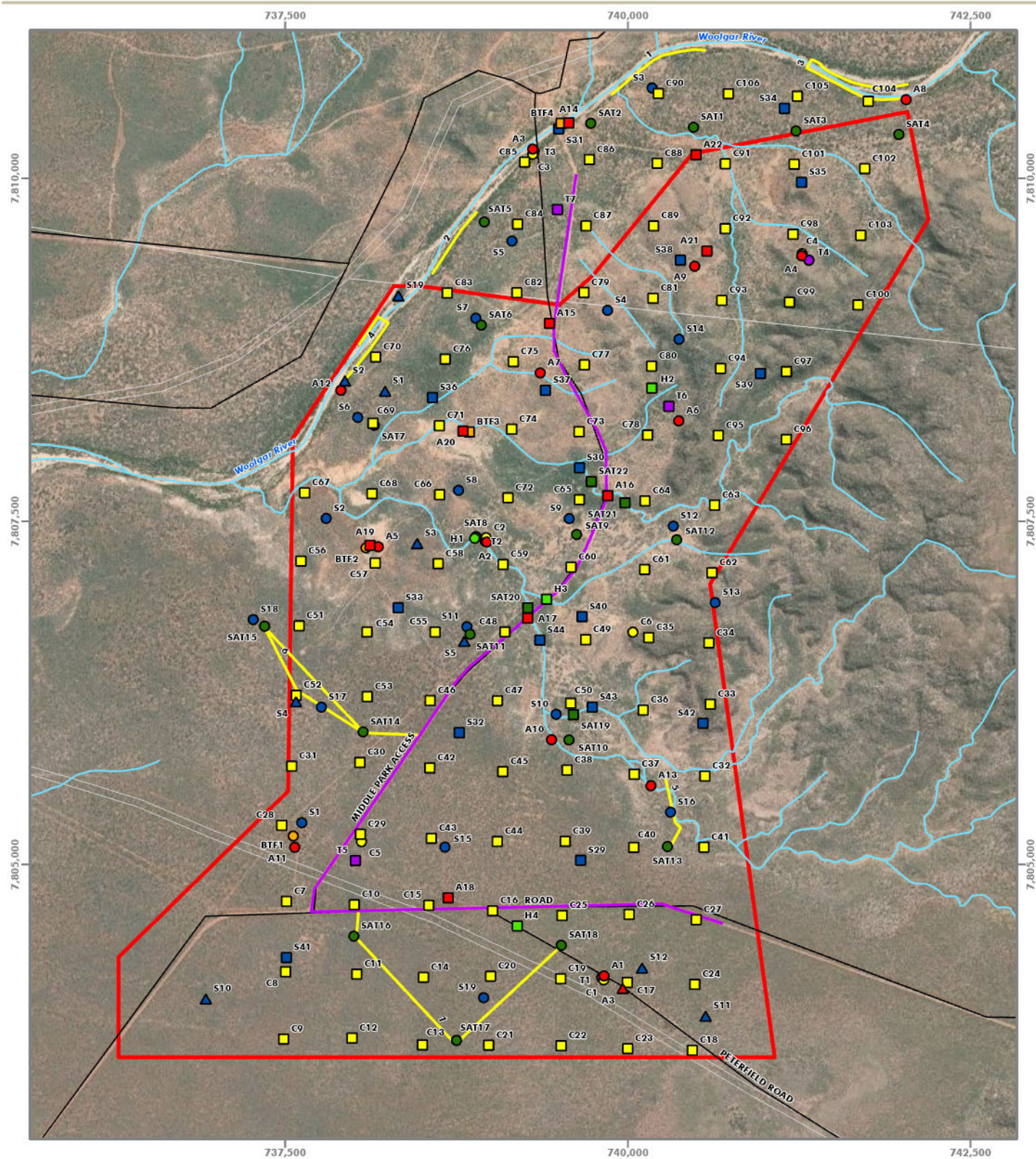
Map Number: E21005_MSES_03_E
Date: 07 September 2022
Map Projection: GDA 1994 MGA Zone 54
Imagery: (c) Digital Globe
Data: Roads, Watercourse, DCDB - (c)DNRM 2022

0 0.5 1 2

Kilometers



**ECO SOLUTIONS
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Legend

 Project site

Road

Vegetation Management Act watercourse

Cadastral boundary

Survey sites (Nov 2017)

● Anabat site

● Black-throated Finch survey site

● Camera trap site

● Harp trap site

● Koala SAT site

● Supplementary survey site

● Systematic trap site

▲ Spotlight drive transect

— Koala transect

Survey sites (April 2019)

■ Anabat site

■ Black-throated Finch survey site

■ Camera trap site

■ Harp trap site

■ Koala SAT site

■ Supplementary survey site

■ Systematic trap site

Survey sites (April 2021)

▲ Anabat site

▲ Supplementary survey site

Figure 4 : Fauna survey sites

Big Vein South Gold Project

Map Number: E21005_MSES_04_C

Date: 12 August 2022

Map Projection: GDA 1994 MGA Zone 54

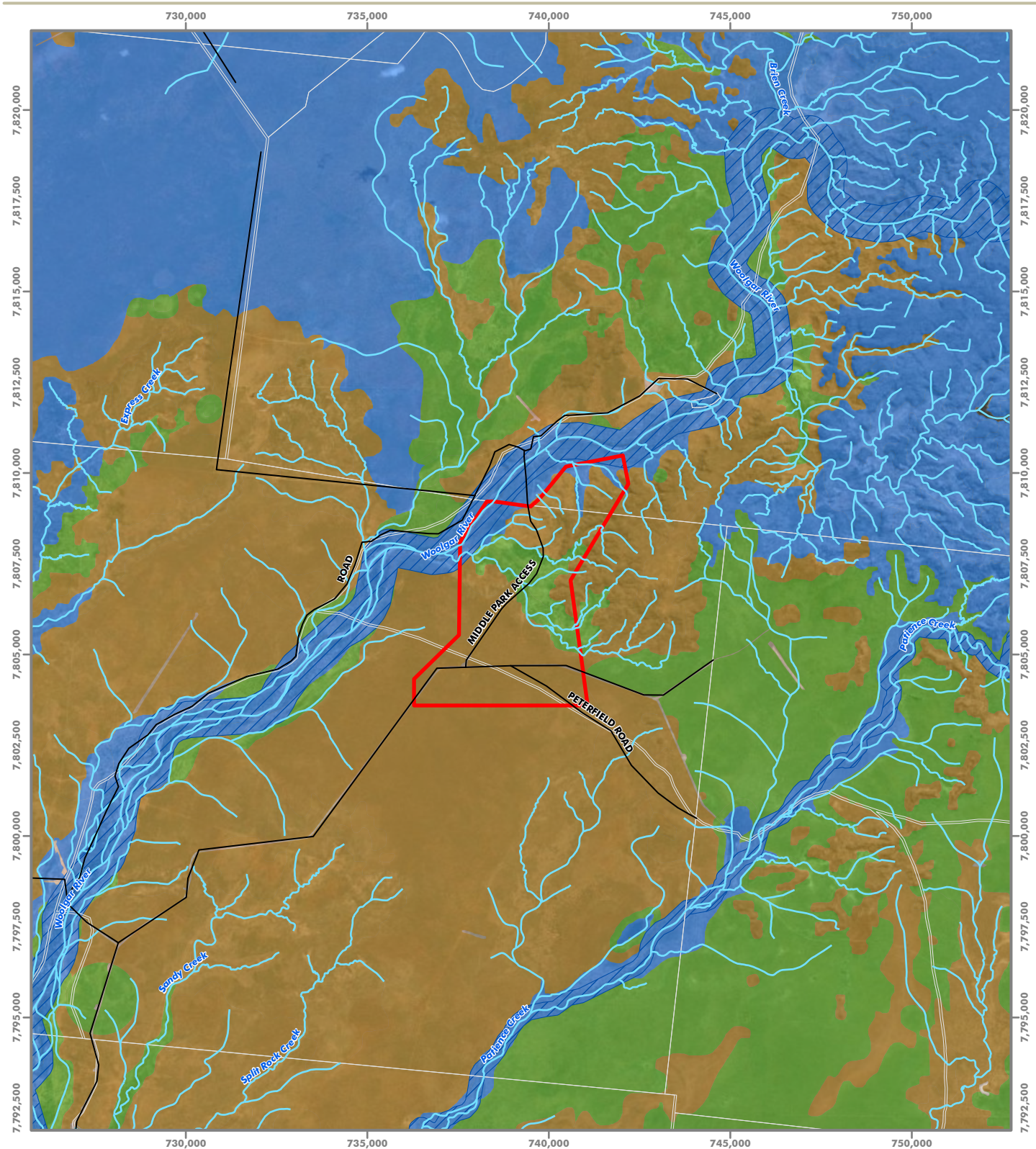
Imagery: (c) Digital Globe

Data: Roads, Watercourse, DCDB - (c)DNRM 2022

0 0.5 1 2

Kilometers





Legend

- Project site
- Road
- Vegetation Management Act watercourse
- Cadastral boundary
- Ecological Corridors**
- State
- Biodiversity Significance**
- State
- Regional
- Local or Other Values

Figure 5 : Biodiversity Planning Assessment mapping

Big Vein South Gold Project

Map Number: E21005_MSES_05_C
 Date: 07 September 2022
 Map Projection: GDA 1994 MGA Zone 54
 Imagery: (c) Digital Globe
 Data: Roads, Watercourse, DCDB, RE, Wetlands - (c)DNRM 2022

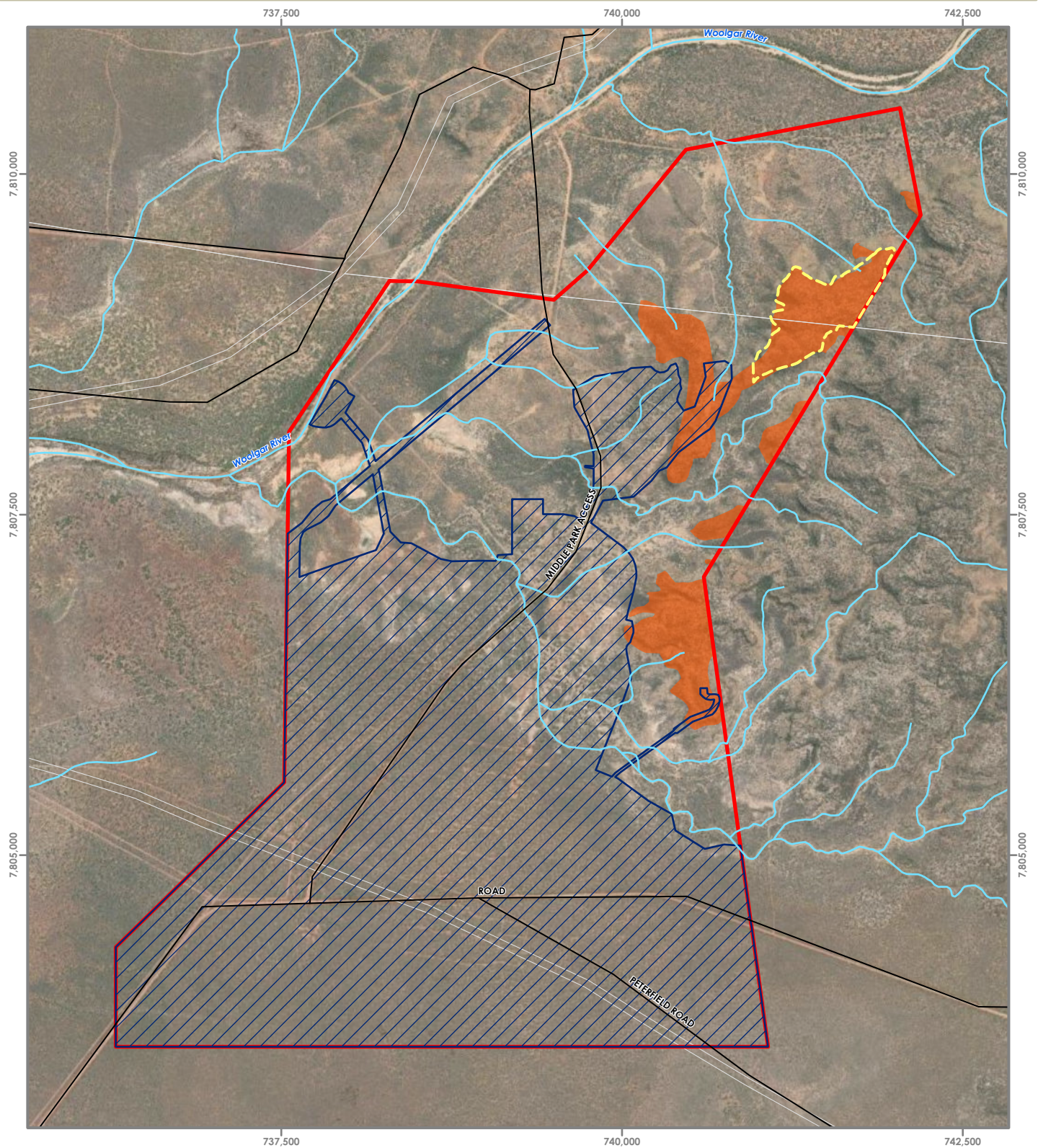
0 1 2 4 6
 Kilometers







- 0 0.5 1 2
Kilometers
- N
- ECO SOLUTIONS
& MANAGEMENT



Legend

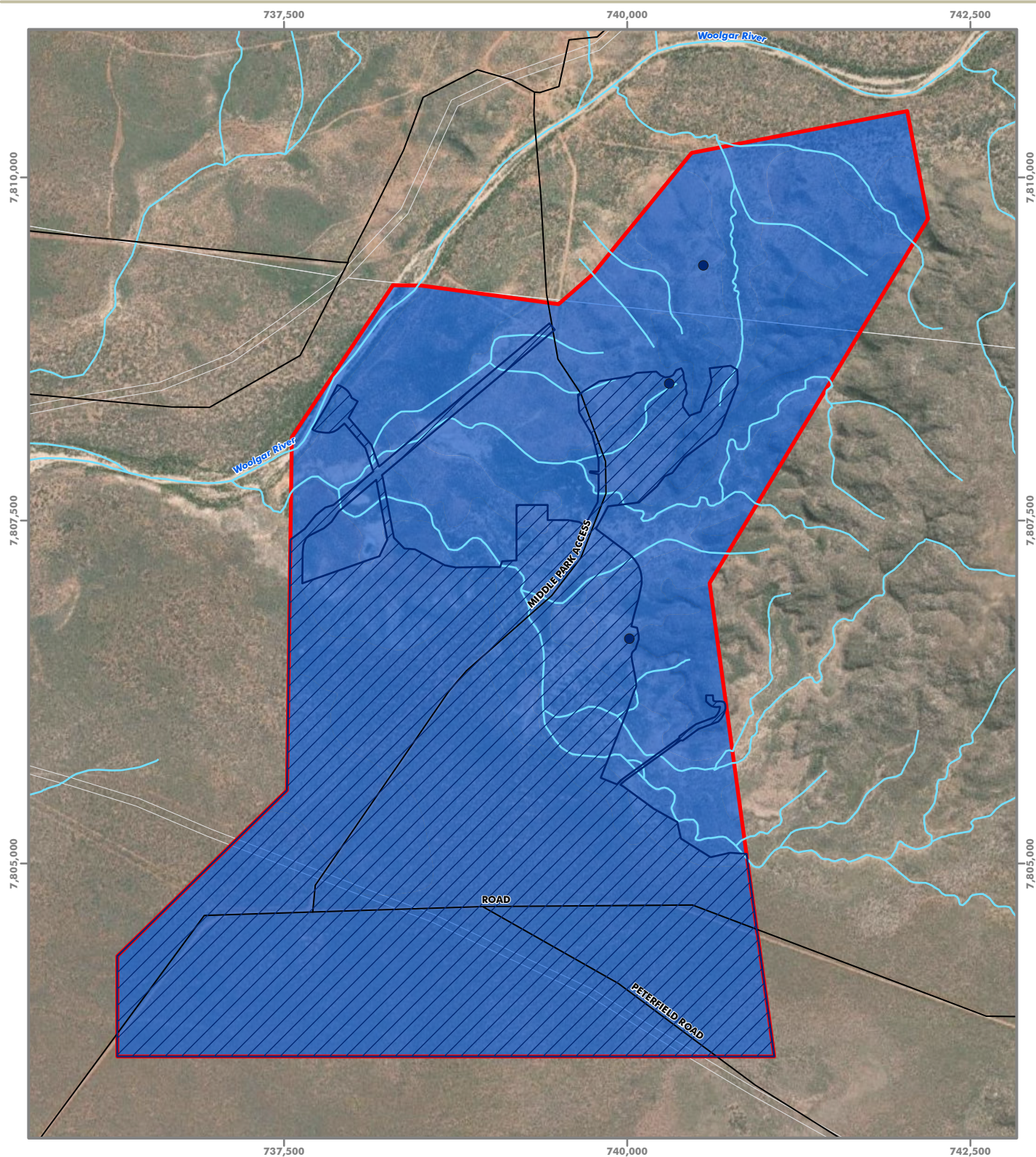
- Project site
- Disturbance footprint
- Road
- Vegetation Management Act watercourse
- Cadastral boundary
- Area not surveyed in detail due to access and steep terrain
- Drummondita calida* (no common name) - Vulnerable (NC Act)**
- Potential habitat

**Figure 8 : Potential habitat mapping
for *Drummondita calida***

Big Vein South Gold Project

Map Number: E21005_RTC_01_B
 Date: 10 February 2026
 Map Projection: GDA 1994 MGA Zone 54
 Imagery: (c) Digital Globe
 Data: Roads, Watercourse, DCDB - (c)DNRM 2022





Legend

- Project site
- Disturbance footprint
- Road
- Vegetation Management Act watercourse
- Cadastral boundary
- Short-beaked Echidna (*Tachyglossus aculeatus*) - Special least concern (NC Act)**
 - Recorded locations
 - Habitat

Figure 9 : Recorded locations and habitat for the Short-beaked Echidna

Big Vein South Gold Project

Map Number: E21005_MSES_09_G
 Date: 07 September 2022
 Map Projection: GDA 1994 MGA Zone 54
 Imagery: (c) Digital Globe
 Data: Roads, Watercourse, DCDB - (c)DNRM 2022



ECO SOLUTIONS & MANAGEMENT

Appendix A

Detailed methodology

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A1 Nomenclature

A1.1 Flora

Application of flora scientific names in this report follows (Brown and Bostock 2019). In the first occurrence in the text, common names (if one exists) will be followed by its scientific name. Common names for flora were derived from (Harden et al. 2006), (Brooker and Kleinig 2008), (Maslin 2001), (Hacker 1990), (Tothill and Hacker 1996), (Sharp and Simon 2002) and (Auld and Medd 2002). Use of an asterisk (*) indicates the species is not native to Queensland, e.g. Common Lantana (**Lantana camara* var. *camara*). Following the first in-text reference, species will be referred to by common name only, where one exists.

A1.2 Fauna

Taxonomy and nomenclature for fauna species, including common names, within this report follows (Macdonald 2013).

Common names are used where a species has an accepted common name with the scientific name provided at the first instance of the name appearing in the text. Common names for fauna are sourced from the references listed above or where no common name is provided, searches are made for other widely accepted common names.

A2 Desktop study

A2.1 Database searches and government mapping

Database searches were undertaken for the project site and surrounding areas to identify records or potential occurrences of threatened, near threatened, migratory and/or special least concern flora and fauna species and critically endangered, endangered, vulnerable and/or of concern vegetation communities. Database searches were undertaken for an area within 50 km of the boundary of the project site. The size of the project site in combination with the 50 km buffer necessitated two search areas as database searches can generally only be undertaken within two latitudes and longitudes. The search area is considered to be representative of the broader region.

Desktop searches were undertaken prior to field surveys commencing and then again prior to impact assessment and covered the following databases and government mapping sources:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool, accessed 3 February 2022 (DAWE 2022) (Appendix B)
- Queensland Wildlife Online database, accessed 3 February 2022 (DES 2022a) (Appendix B)
- Australasian Virtual Herbarium database, accessed 3 February 2022 (CHAH 2022) (Appendix B)
- The Atlas of Living Australia¹, accessed 3 February 2022 (CSIRO 2022)
- Protected Plants Flora Survey Trigger Map, accessed 04 February 2022 (DES 2022b) (Appendix B)
- Vegetation Management regional ecosystem Map Version 12.1 (DR 2022a) and Essential Habitat Mapping and Database Version 10.03 (DR 2022b) maps at 1:100 000 scale Essential habitat is mapped by DES and is vegetation in which a flora or fauna species that is endangered, vulnerable or near threatened has been known to occur.
- Vegetation Management Wetlands Map, Version 7.03 (DR 2021c). The Queensland Government has produced a vegetation management wetlands map under section 20AA of the VM Act. This map shows wetlands, as defined under the VM Act. It is used primarily to regulate vegetation clearing in areas mapped as wetlands. Significant residual impacts on REs that intersect with an area shown as a wetland on the vegetation management wetlands map are required to be offset (to the extent of the intersection).

¹ The Atlas of Living Australia is a publicly available database that is populated by a wide range of contributors including 'citizen-based' contributors. The database does not allow for every individual observation to be validated. Therefore, this database has been used as secondary supporting information.

- Vegetation Management Watercourse Map, Version 5.0 (DR 2021). The Queensland Government has produced a vegetation management watercourse map under section 20AB of the VM Act. This map shows watercourses, as defined under the VM Act. It is used primarily to regulate vegetation clearing in proximity of watercourses. The map is produced based on desktop information and includes stream order mapping under the Strahler method. Significant residual impacts on REs located within a defined distance of watercourses are required to be offset.
- Geological Survey of Queensland 1:100 000 mapping (NRM 2011)
- Map of Referable Wetlands, accessed 19 December 2021. DES has a range of policies and programs to manage wetlands. As part of a broader policy of wetland protection, and in accordance with schedule 12, part 2 of the Queensland *Environmental Protection Regulation 2008* (EP Regulation), the EHP has prepared a map of referable wetlands. The map of referable wetlands includes:
 - WPAs, which comprise:
 - wetlands of high ecological significance (HES) located within Great Barrier Reef catchments
 - trigger areas that represent the area of hydrological influence of HES wetlands. Outside urban areas, the trigger area is 500 m from the edge of a HES wetland
 - wetlands of general ecological significance (GES).
 - WPAs and HES wetlands contain wetland environmental values as listed under section 81A of the EP Regulation. WPAs are derived using a mapping method developed by the EHP called the Aquatic Biodiversity Assessment and Mapping Method. Significant residual impacts on WPAs are required to be offset in accordance with the Queensland Environmental Offsets Framework.
- Queensland Wetland Data Springs Mapping (DES 2022c).

The Biodiversity Assessment and Mapping Methodology (BAMM) has been prepared to provide a consistent approach for assessing biodiversity values at the landscape scale in Queensland using vegetation mapping data generated or approved by the Queensland Herbarium as a fundamental basis. It is being used by DES to generate Biodiversity Planning Assessments (BPAs) for each of Queensland's bioregions, including the Brigalow Belt Bioregion where the assessment area is located.

BPAs are developed in two stages:

- 1) diagnostic criteria: involves the integration of ecological criteria using BAMM to determine the relative Biodiversity Significance
- 2) supplementary/expert panel criteria: allows for the refinement of the mapped information from Stage 1 by incorporating local knowledge and expert opinion.

The methodology has application for identifying areas with various levels of significance solely for biodiversity reasons. These include threatened ecosystems or taxa, large tracts of habitat in good condition and buffers to wetlands or other types of habitat important for the maintenance of biodiversity or ecological processes.

Three biodiversity significance levels are mapped for any given region as follows:

- State biodiversity significance - areas assessed as being significant for biodiversity at the bioregional or State scales
- Regional biodiversity significance - areas assessed as being significant for biodiversity at the sub-bioregional scale
- Local biodiversity significant and/or other values - local values that are of significance at the local government scale.

The BPA mapping is for planning purposes and does not provide any specific statutory protection.

A2.2 Literature review and previous studies

No other large-scale projects involving flora and fauna surveys have been undertaken within a 50 km radius of the projects site.

A2.3 Review of aerial photography

Aerial photography (flown 2016) was used for this assessment. Digital Globe photography was viewed in relation to relevant biodiversity spatial layers. Aerial photography was used to identify features for ground-truthing during the field surveys, to identify appropriate survey locations and for determining and characterising potential terrestrial flora and fauna habitats.

A2.4 Regional ecosystem mapping

The Queensland Government produces regulated vegetation maps and supporting RE maps showing the distribution of remnant regional ecosystems (REs) throughout Queensland. These published maps are produced using Landsat satellite imagery, aerial photography and field based ground-truthing. During the preparation of this report the Queensland Government's *Remnant Vegetation and Regional Ecosystem Versions 12.1* maps at 1:100,000 scale were in effect. This mapping along with previous versions was also reviewed prior to field surveys to inform survey locations.

This assessment uses the most current RE descriptions from the Queensland Herbarium (2021) Regional Ecosystems Description Database (REDD) Version 12.1 (Queensland Herbarium 2021).

A2.5 Geological mapping

A review of geological mapping for the project site has been undertaken and is provided in Section C1.1, Appendix C. The geological mapping was reviewed in order to gain an understanding of the geology within the project site and to provide an indication of likely land zones for assigning REs.

Queensland's RE system is a simplified land classification tool specifically developed for the purpose of biodiversity planning. The RE system comprises three component parts: bioregion, land zone and vegetation.

Land zones are a simplified method of classifying land based on its landform, geomorphology and surface soils in order to identify areas where vegetation types commonly occur. They do not provide an accurate representation of the surface geology within land zones. The EAR Groundwater Report provides a detailed assessment of the local surface geology. The EAR Groundwater Report surface geology assessment is based on geological data collected from intrusive investigations at the project site using drilling, test pitting, and augering methods, with additional visual inspections. The surface geology data for the project site has been collected and interpreted by suitably qualified geologists, hydrogeologists and soil scientists.

The geology assessment concludes that the local surface geology has been extensively modified by weathering and erosion. The weathered profile is present across the entire project site and extends to depths of up to 40 m below ground level. The weathered profile comprises poorly consolidated, fine-grained, clay-bound sands and silts. The weathered profile is overlain by localised alluvium associated with the Woolgar River and its floodplain. The Woolgar River alluvium is a sand and gravel deposit that forms the Woolgar River floodplain. The floodplain alluvium is confined within a narrow valley. The floodplain alluvium thickness typically ranges from a few centimetres at the edge of the floodplain up to approximately 10 m on the riverbanks. The river channel is incised into the floodplain alluvium. Outside the Woolgar River floodplain, the project site is traversed by several minor drainage features. The upper reaches of the drainage features are characterised by incised rocky gullies while the lower reaches typically contain a thin sandy bed overlying the weathered bedrock profile. The surficial sand deposits associated with these drainage features are typically a few centimetres thick.

For the purposes of this ecology assessment it was necessary to map some areas of surficial sands as land zone 3 (i.e. Quaternary alluvium). This mapping decision was based on the vegetation types present in these areas, rather than any detailed geological assessment, and was necessary to ensure consistency with the land zone classification tool and the wider RE mapping system. Refer to the EAR Groundwater Report for the geology assessment and a detailed description of the local geology.

A2.6 Soil mapping

A review of the Atlas of Australian Soils – Queensland for the assessment area has been undertaken and is provided in Section C1.2 of Appendix C. The soil mapping was reviewed in order to correlate vegetation types and habitat preferences of particular flora and fauna, to soil types present in the assessment area (Bureau of Rural Sciences 2009).

A3 Terrestrial ecology field surveys

The terrestrial ecology field surveys referred to in this report were completed in 2015, 2016, 2017, 2019 and 2021 over a number of survey periods. The following sections present the methodologies used during these field surveys.

A3.1 Survey team

Five ecologists contributed to the field surveys and preparation of this terrestrial ecology assessment. The team and their qualifications are outlined in Table A1.

Table A1: Ecology survey team

Team member	Title	Years of experience	Qualifications	Role
Chris Hansen	Specialist Botanist	23	BSc (Hons)	Flora field survey lead, technical review
Michael O'Connor	Ecologist	11	BESc	Flora and fauna field surveys, reporting
Steve Marston	Principal Ecologist	25	BEnvEng (Hons) MWildMgt	Fauna field survey lead, technical review
Ben Nottidge	Principal Ecologist	22	BAPSc, PGDipSc	Fauna field survey
Meredith Watherston	Principal Ecologist	20	BSc (Env)	Technical reporting

A3.2 Permits

The field surveys were undertaken under the following permits and approvals that were current at the time of the surveys:

- Scientific Purposes Permit:
 - WISP16474815 (valid from 25 October 2015 to 25 October 2020) and
 - WA0027391 (valid from 26 October 2020 to 25 October 2025)
- Animal Ethics Committee Approval:
 - CA 2015/09/898 (valid from 1 October 2016 to 25 August 2018) and
 - CA 2018/06/1200 (valid from 25 August 2018 to 25 August 2021).

A3.3 Coordinate system and map datum

Positional data was collected using a geographic positioning system with an accuracy of 3 to 5 m. Positional locations were recorded using the Latitude and Longitude coordinate system. All locations presented in this report are within zone 54L. The map datum used was WGS84.

A3.4 Survey program

Optimal fauna survey timing for the Gulf Plains bioregion is November to January (early wet season) and May to July (early dry season), according to the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (V 3.0)* (Queensland Herbarium 2018). Early dry and early wet season terrestrial flora and fauna surveys were conducted in order to field-validate the type, distribution and remnant status of vegetation communities and develop an inventory of flora and fauna species present. The following surveys were conducted:

- flora surveys:
 - early wet season = 11 days (12 – 22 November 2015, inclusive)
 - early dry season = 8 days (11 – 18 April 2016, inclusive)
 - early wet season = 3 days (19, 21 and 24 November 2017)
 - early dry season = 9 days (27 April – 5 May 2021, inclusive)
- fauna surveys:
 - early wet season = 12 days (13 – 24 November 2017, inclusive)
 - early dry season = 15 days (24 April – 8 May 2019, inclusive)
 - early dry season = 3 days (accumulated between 27 April and 2 May 2021, inclusive).

Field surveys were completed at these times in order to capture the effects of seasonality and rainfall on the abundance of flora and fauna species in accordance with recommended survey timing in the Queensland Fauna Survey Guidelines (Queensland Herbarium 2018). Targeted surveys were also undertaken during the known flowering periods of certain species of plants. Table A2 presents the duration and timing for each of the survey periods as well as a summary of climate conditions experienced during and leading up to each survey event.

Table A2: Survey program climatic conditions

Survey event	Survey period (inclusive of dates)	Summary of climatic conditions ¹		
		Min. Temp. (°C)	Max. Temp. (°C)	Rainfall (mm)
2015 survey events				
Flora survey (11 days – early wet season)	12 – 22 November 2015	17.0	41.4	18.3
2016 survey events				
Flora survey (8 days – early dry season)	11 – 18 April 2016	16.9	35.5	2.4
2017 survey events				
Flora survey (3 days – early wet season)	19, 21 & 24 November 2017	13.4	40.9	66.2
Fauna survey (12 days –early wet season)	13 – 24 November 2017	13.4	40.9	66.2

Survey event	Survey period (inclusive of dates)	Summary of climatic conditions ¹		
		Min. Temp. (°C)	Max. Temp. (°C)	Rainfall (mm)
2019 survey events				
Fauna survey (15 days – early dry season)	24 April - 8 May 2019	9.9	33.9	25.6
2021 survey events				
Flora and fauna survey (9 days – early dry season)	27 April – 5 May 2021	13.3	32.7	20.4

¹ Includes minimum and maximum temperatures during the survey period, total rainfall experienced during and up to four weeks preceding the survey period. Daily data obtained from the nearest Bureau of Meteorology (BoM) weather station with complete data (Richmond Airport and Post Office stations #30161 and #30045, respectively) (BoM 2021).

A3.5 Climatic conditions

Bureau of Meteorology (BoM) climatic data has been collected since 1889 from the Richmond Post office, and since 2020 from the Richmond Airport weather stations, located approximately 100 km south of the project site. These weather stations are the closest to the project site in the same catchment that have consistent climate data for an extended period of time and therefore, present the most reliable data available at this time.

A3.5.1 Rainfall patterns

Monthly rainfall averages recorded at the BoM Richmond Airport and Post Office weather stations (30161 and 30045, respectively) are provided in Table A3. Given the rainfall records at these stations cover a period of over 100 years (i.e. since 1889), the data are considered to reflect regional rainfall patterns. Actual monthly rainfall totals recorded in the years preceding the surveys, i.e. 2015, 2016, 2017, 2019 and 2021, at these weather stations are also provided in Table A3. This data was used to show average regional rainfall information at the time of the surveys and in the preceding years.

The Gulf region, as with other regions of northern Australia, experiences a wet season from approximately November to March and a dry season between April and October. As can be seen from Table A3, substantial and above average rainfall was experienced in the region in the early dry season surveys in April 2016, 2019 and 2021. As expected, dry conditions preceded each of the early wet season surveys in November 2015 and 2017.

Table A3: Monthly recorded rainfall for the local area

Month	Mean annual rainfall (mm)	Actual total rainfall (mm)							
		2014	2015	2016	2017	2018	2019	2020	2021
January	121.1	16.6	<i>213.5</i>	45.4	153.2	14.6	<i>153.2</i>	<i>276.0</i>	<i>10.8</i>
February	104.9	181.9	65.2	6.8	50.2	108.2	526.6	45.6	166.4
March	62.1	3.4	<i>8.1</i>	209.4	88.0	198.8	36.2	<i>38.0</i>	<i>24.4</i>
April	22.0	10.8	<i>0.2</i>	0.0	0.0	0.0	<i>0.6</i>	<i>0.0</i>	<i>20.4</i>
May	14.7	0.0	<i>0.4</i>	14.6	2.0	0.0	<i>13.2</i>	<i>26.0</i>	<i>0.0</i>
June	15.3	11.4	<i>15.8</i>	24.8	0.0	<i>0.0</i>	<i>39.4</i>	<i>0.0</i>	6.8
July	9.9	0.6	1.8	116.7	4.0	<i>0.0</i>	<i>0.8</i>	<i>0.0</i>	<i>0.2</i>
August	4.1	5.7	0.0	5.8	0.0	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	2.0
September	6.2	0.0	2.2	11.9	0.0	0.0	<i>0.0</i>	<i>13.0</i>	7.6
October	15.7	<i>1.1</i>	0.0	15.2	27.8	2.8	<i>0.0</i>	8.8	<i>15.6</i>
November	30.6	<i>12.2</i>	19.4	35.0	39.2	<i>1.0</i>	<i>0.0</i>	6.0	<i>114.4</i>
December	69.6	<i>31.0</i>	119.6	89.0	16.0	13.8	<i>0.0</i>	<i>213.8</i>	3.8
Total	476.1	<i>274.7</i>	<i>446.2</i>	574.6	380.4	339.2	<i>770.0</i>	<i>627.2</i>	<i>372.4</i>

Italics indicates data is not quality controlled

Source: Richmond Airport weather station (#30161) and Richmond Post Office weather station (#30045) (BoM 2022)

A3.5.2 Weather conditions during the surveys

The weather conditions during the early wet season survey periods (November 2015 and 2017) (refer Table A2) were characterised by hot days with mild nights, with temperatures over the survey periods ranging between 15.4°C at night and 41.5°C at the warmest during the day. Minimal rainfall was recorded in the four weeks preceding or during the 2015 early wet season flora survey period. Conditions were considered suitable for vegetation assessment and RE mapping. The dry conditions were less favourable for the detection and identification of herbaceous and graminoid (grass) species. However, this was overcome during subsequent surveys. Rainfall slightly above average was recorded in the four weeks preceding the 2017 early wet season fauna survey with an additional 26.6 mm recorded during the survey. The conditions for the fauna survey were considered ideal for the detection of most animal groups including amphibians.

The early dry season survey periods (April – May 2016, 2019 and 2021) were characterised by cool nights and warm days with temperatures ranging from 9.9°C and 35.5°C. Rainfall preceding the 2016 early dry season flora survey was well above average with 209.4 mm recorded. Rainfall in the four weeks preceding the 2021 early dry season flora survey was below average with 20.4 mm recorded. The conditions during the 2016 flora survey were considered ideal for the detection of flora species that may not have been detected during previous dry condition surveys. Rainfall in the four weeks preceding the 2019 early dry season fauna survey was below average with 30.2 mm recorded and no rainfall recorded during

the survey. Similarly, the early dry season fauna survey in 2021 was preceded by below average rainfall. The dry conditions that characterised the early dry season fauna surveys potentially reduced the likelihood of detectability for amphibian species. Despite the dry conditions, amphibians were detected in areas of ponding water in the Woolgar River and its tributaries during these surveys.

A3.6 Flora field survey methods

The flora field survey methods described in this section were developed based on the results of database searches for the project site and desktop review, as presented in Appendices B and C respectively. The surveys were undertaken over a number of survey periods to capture seasonal variation and flowering periods of threatened species.

Detailed survey techniques used throughout the project site are described in the following sections.

A3.6.1 Site selection

The field flora surveys were carried out in compliance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Versions 3.2 and 5.1* (Neldner et al. 2020; 2012). Reference was also made to the *Guidelines for Flora Survey and Assessment in Northern Queensland* (Wannan n.d.).

Multiple sites were conducted within each RE type across the project site. Additional areas were also surveyed in order to ensure full coverage and sampling of all potential habitat types within the project site.

The validation and mapping of remnant vegetation was undertaken at a total of 191 vegetation assessment sites consisting of:

- early wet season surveys - 131 vegetation assessment sites comprised of 14 secondary sites, 71 tertiary sites and 46 quaternary sites.
- early dry season surveys dry season surveys – 60 vegetation assessment sites comprised of 17 habitat quality plots (HQP), 22 secondary sites, 12 tertiary sites, 9 quaternary sites.

Detailed flora species lists were collated at all secondary sites and traverse lists were compiled to account for additional species that were recorded outside of the secondary sites. The less detailed sampling (tertiary and quaternary sites) was conducted to provide additional information relating to the vegetative structure and to assist in mapping the extent and distribution of the identified REs within the project site. The location of the 191 vegetation assessment sites that were completed during the seasonal surveys are shown in Figure 3.

Additional vegetation condition data was collected at the HQPs in accordance with the Department of Environment and Science's (DES) '*Guide to determining terrestrial habitat quality, Version 1.3*' (Habitat Quality Guide) (DES 2020a). These HQPs were concentrated in vegetation communities that are most likely to be directly impacted by the project.

The remnant status of existing vegetation was confirmed by comparing the existing predominant canopy with the undisturbed predominant canopy. The Queensland Herbarium defines the predominant canopy under the *Vegetation Management Act 1999* (VM Act), as the ecologically dominant layer (EDL), namely, that stratum of the vegetation that contains the most above ground biomass. The EDL can be defined in terms of growth form, height, cover density, and species. In the majority of cases, the EDL is equivalent to the upper stratum (Walker and Hopkins 1990).

The crown cover definitions and associated crown separation descriptions (e.g. sparse) were also applied to the lower strata to allow a consistent description of the spatial distribution of the respective vegetation layers.

The landform description upon which the field validated vegetation communities occurred was based on simple erosional landform patterns characterised by relief and modal slope and described by (McDonald et al. 1990).

The range of vegetation and flora assessment sites undertaken within the project site are described in the following sections.

A3.6.2 Secondary sites

Data recorded at each secondary site (Figure 3) included:

- date and precise location (with reference to handheld Global Positioning System (GPS))
- soils, slope, aspect and landform observations
- ground-layer, mid-stratum and canopy species composition and abundance
- structural characteristics
- condition and disturbance of existing vegetation communities (including distribution of weed species)
- quantitative and qualitative species composition within a 1,000 m² quadrat, and documentation of ancillary species identified within the immediate area or during foot traverse
- basal area of vegetation (Bitterlich Stick methodology)
- photographs of the community (north, east, south, west, groundcover and soils).

A3.6.3 Tertiary sites

Data recorded at each tertiary site (Figure 3) included:

- date and precise location (with reference to handheld GPS)
- soils, slope, aspect and landform observations
- ground-layer, mid-stratum and canopy species composition and abundance
- structural characteristics
- basal area of vegetation (Bitterlich Stick methodology)
- condition and disturbance of existing vegetation communities (including distribution of weed species)
- photographs of the community.

A3.6.4 Quaternary sites

Data recorded at each quaternary site (Figure 3) included:

- precise location (with reference to handheld GPS)
- ground-cover, mid-stratum and canopy species composition and abundance
- structural characteristics of the EDL
- condition
- limited photographs of the community.

A3.6.5 Habitat quality plots

Each HQP (Figure 3) involved a 100 m x 50 m plot in which a series of 10 ecological condition attributes were recorded in accordance with the Habitat Quality Guide. Attributes recorded are outlined in Table A4. The median vegetation height data was measured using a laser rangefinder (hypsometer) and the diameter of trees measured at breast height (nominally 1.3 m above the ground) with a diameter at breast height (DBH) tape.

In addition to the information collected in Table A4, the following was noted at each HQP:

- orientation of the HQP
- date and precise location (with reference to handheld GPS)
- soils, slope, aspect and landform observations.

Table A4: Habitat quality plot ecological condition criteria

Ecological condition criterion	Description
100 m transect	- Tree canopy cover - Tree sub-canopy cover - Native shrub cover Measured as projected foliage cover that intercepts the transect line.
100 m x 50 m plot	- Number of large eucalypt trees - Number of large non-eucalypt trees - Tree canopy height – median canopy height - Recruitment of canopy species – proportion of dominant canopy species that are regenerating - Native tree species richness – number of species present
50 m x 20 m plot	Coarse woody debris – length of all logs >10 cm diameter, 0.5 m in length
50 m x 10 m plot	- Native shrub, grass and forbs/other species richness - Non-native plant cover – cover of exotic species as a component of the overall vegetation cover
1 m x 1 m quadrats	Cover (%) of: - Native perennial grass - Organic litter - Native forbs and other species - Native shrubs (<1 m in height) - Non-native grass - Non-native forbs and shrubs

A3.6.6 Targeted species surveys

Targeted surveys for threatened and near threatened flora species were designed with reference to the database search results and the Queensland *Flora Survey Guidelines – Protected Plants; Nature Conservation Act 1992, Versions 2.01 and 2.0* (Flora Survey Guidelines), which were current at the time of the field surveys (DES 2020b; EHP 2016).

Target species were determined using the likelihood of occurrence assessment and tailored to focus on areas of suitable habitat (e.g. sandstone plateaus, springs and woodland on sedimentary rocks).

Areas of suitable habitat were searched in their entirety using a combination of the “random meander” technique (Cropper 1993) and the “educated walk” technique (Garrard et al. 2008). Both techniques are recognised as being appropriate and effective techniques in the relevant Commonwealth and State flora survey guidelines listed above. In accordance with the Queensland Flora Survey Guidelines, all flora species encountered during each traverse were recorded.

A3.6.7 Threatened species quantification quadrats

One NC Act listed near threatened flora species was recorded in the project site. Due to the small size of the population a direct count of the numbers of individuals within this population was possible. No threatened MSES were identified in the project site.

A3.6.8 Vegetation mapping

Queensland Government mapped REs in the project site were validated in the field using the survey data as previously described in Sections A3.6.1 to A3.6.5, and utilised the latest geology mapping (NRM 2011). The boundaries of vegetation types were mapped in the field using a differential GPS and/or aerial photograph interpretation. This ground truthed mapping was submitted to the Queensland Herbarium for validation as part of the response to DETSI's additional information request. The Herbarium validated vegetation map was used as the basis for this assessment (Figure 6).

A3.6.9 Random traverses

In addition to secondary, tertiary and quaternary sites, random meander surveys (Cropper 1993) were conducted on foot across large portions of the project site. The purpose of random traverses was to ensure adequate coverage of the project site and to establish a comprehensive floral species list. This method is also essential for the detection of cryptic, pest and other significant species. This method was supplemented with 'educated walks' (Garrard et al. 2008) in habitat areas that possessed a higher likelihood of supporting threatened flora species.

A3.6.10 Ancillary information

Other field characteristics such as areas of weed infestation, habitat areas for significant species and regional connectivity were recorded and described. Photographic records were taken throughout the project site, capturing each community type, habitat type and the broader landscape.

A3.6.11 Flora inventory and abundance

A comprehensive flora species list, including native and introduced species, was compiled for the project site. Relative abundance of flora species was assessed on a site-by-site basis, with detailed inventories compiled at all secondary sites and complemented with records obtained during foot traverses of communities with similar composition. The relative abundance of species was based on the Braun-Blanquet technique, (Mueller-Dombois and Ellenberg 2003; Whittaker 1975).

In relation to vegetation structure, abundance estimates were determined for species within each stratum of the community, with particular focus on the EDL as it is by these species that the community is defined, and from this, the RE determined (Neldner et al. 2019).

A3.7 Fauna field survey methods

Detailed survey techniques used throughout the project site are described in the following sections.

A3.7.1 Overview of survey effort

A variety of faunal survey methods were used during the fauna field surveys, including systematic trap sites, spotlighting, call playback, infrared cameras, active searching, harp traps, Anabat detectors and observation (e.g. bird surveys and opportunistic observations).

Sites selected for each of the survey methods were determined through desktop review of aerial photography, RE mapping and database search results in order to stratify survey effort across major habitat types for species likely to occur in the project site. Reference was also made to the *Recommended Fauna Survey methodology for Environmental Impact Assessments* (Freeman 2009).

The desktop information was initially used to design the survey, which was then refined where necessary in the field, once an on-ground appreciation for the vegetation communities and habitat features (e.g. locations of wetlands, vine thicket pockets, watercourses etc.) could be obtained.

Table A5 details the survey effort conducted during the survey periods. The following sections describe the methods used during the surveys and locations of the survey sites.

Table A5: Fauna survey effort

Survey technique	Seasonal survey effort				Target fauna
	Early wet season 2017	Early dry seasons		Total	
		2019	2021		
Small Elliot Traps (Type A)	400 trap nights	300 trap nights	n/a	700 trap nights	Small mammals, some reptiles
Large Elliot Traps (Type B)	80 trap nights	60 trap nights	n/a	140 trap nights	Small and medium sized mammals including the Northern Quoll
Funnel Traps	96 trap nights	72 trap nights	n/a	168 trap nights	Small mammals, reptiles and frogs
Pitfall Traps	64 trap nights	48 trap nights	n/a	112 trap nights	Small mammals, reptiles and frogs

Survey technique	Seasonal survey effort				Target fauna
	Early wet season 2017	Early dry seasons		Total	
		2019	2021		
Spotlighting (including by vehicle)	16 person hours on foot and 27.5 person hours from a slow moving vehicle	13 person hours on foot and 21 person hours from a slow moving vehicle	2 person hours on foot and 2 person hours from a slow moving vehicle	30 person hours on foot and 51.5 person hours from a slow moving vehicle	Mammals (Northern Quoll, Koala), reptiles, nocturnal birds
Call Playback	13 sessions	13 sessions	2 sessions	28 sessions	Owls
Infrared Cameras	20 nights for short term cameras at systematic trap sites and supplementary sites	1,788 nights for long-term cameras	n/a	1,808 camera nights	Medium to large mammals (Koala, Northern Quoll, Short-beaked Echidna), and reptiles
Bird Survey	39 person hours of morning bird surveys in addition to 27 person hours of targeted water point surveys	26 person hours of morning bird surveys in addition to 63 person hours of targeted water point surveys	5 person hours morning bird surveys	70 person hours of morning surveys and 90 hours of targeted water point surveys	Birds (including Squatter Pigeon, Black-throated Finch, migratory birds)
Opportunistic / Incidental Bird Survey	136 diurnal person hours and 14 nocturnal person hours	198 diurnal person hours and 14 nocturnal person hours	30 diurnal person hours and 4 nocturnal person hours	364 diurnal person hours and 32 nocturnal person hours	Birds (including Squatter Pigeon, Black-throated Finch, migratory birds), medium to large reptiles
Active Searching	23 person hours	14 person hours	5 person hours	42 person hours	Small mammals and reptiles, all conservation significant species (including Koala,

Survey technique	Seasonal survey effort				Target fauna
	Early wet season 2017	Early dry seasons		Total	
		2019	2021		
					Northern quoll, Short-beaked Echidna and migratory birds)
Anabat	13 nights	9 nights	1 night	23 nights	Microbats
Harp Traps	4 trap nights	6 trap nights	n/a	10 trap nights	Microbats
Koala transects	7 transects (equating to 9.3 km and 93 ha)	-	-	7 transects	Koala
Spot Assessment Technique (SAT) sites	18 sites	4 sites	-	22 sites	Koala

A3.7.2 Systematic trap sites

A total of 7 systematic trap sites were established throughout the project site during the terrestrial fauna surveys (Figure 4).

Each systematic trap site consisted of:

- 25 small Elliot traps (Type A)
- 5 large Elliot traps (Type B)
- 6 funnel traps
- 4 pitfall traps (20 L bucket)

The combined surveys comprised a total of 700 trap nights (trap nights refers to the total number of traps that were open for a total number of nights, e.g. four traps open for five nights equates to 20 trap nights). In addition, one infrared camera trap was also placed at each systematic trap site during the early wet season survey (i.e. 20 trap nights over both seasons), giving a total of 720 trap nights over the seasonal surveys.

Elliot traps were baited with a mixture of rolled oats, honey and peanut butter (Queensland Herbarium 2018). Traps were located 5 to 10 m apart and positioned close to suitable microhabitat features such as fallen logs, dense grass tussocks or areas of surface rock (e.g. exposed rocky outcrops). Type B Elliot traps were also baited with salami to target Northern Quoll. Traps were checked early in the morning and any animals captured were identified and immediately released.

Pitfall traps comprised four 20 L buckets dug into the ground to rim level, with a drift fence that intersected the mouth of each bucket and extended beyond the line of buckets to guide fauna towards the buckets. A water-soaked sponge, leaf litter and a small piece of polystyrene foam was placed in each bucket to provide moisture and shelter for animals captured. The polystyrene foam is able to be used as a flotation device for captured animals so that they do not drown in the event of heavy rain.

Six funnel traps were also located along the drift fence to capture larger lizards and snakes that could escape or avoid the buckets. Funnel traps were covered with a towel to provide shelter for captured animals.

A minimum of one-person hour each of spotlighting and active searching was conducted at each systematic trap site. A minimum of one-person hour of early morning bird surveys was also conducted at each systematic trap site, each morning while traps were being checked.

A brief description of the location and habitat attributes of each of the systematic trap sites is provided in Table A6.

Table A6: Descriptions of habitat at each systematic trap site

Survey site ID	Vegetation description
Early wet season survey	
T1	Long-fruited Bloodwood (<i>Corymbia polycarpa</i>) woodland, with Darwin Woollybutt (<i>Eucalyptus miniata</i>) and Rough-leaved Bloodwood (<i>Corymbia setosa</i>). <i>Acacia elachantha</i> (no common name), Georgetown Box (<i>Eucalyptus microneura</i>) and juvenile canopy species are present in the understorey, with Currant Bush (<i>Carissa lanceolata</i>). The ground layer was native and dominated by Northern Kerosene Grass (<i>Aristida hygrometrica</i>) and <i>Waltheria indica</i> (no common name). Heavily grazed in some areas and evidence of slow recover from fire in some areas. Hollow bearing trees abundance was sparse with moderate to sparse cover of deep leaf litter and fallen timber
T2	Molly Red Box (<i>Eucalyptus leptophleba</i>), Georgetown Box and River Red Gum (<i>Eucalyptus camaldulensis</i> var. <i>obtusa</i>) woodland. Other canopy trees include Long-fruited Bloodwood, Broad-leaved Carbeen (<i>Corymbia confertiflora</i>) and Jigal Tree (<i>Lysiphyllum cunninghamii</i>). The understorey was diverse with <i>Acacia elachantha</i> , Weeping Paperbark (<i>Melaleuca fluviatilis</i>), Arid Peach (<i>Terminalia aridicola</i>), Jigal Tree and Cooktown Ironwood (<i>Erythrophleum chlorostachys</i>) occurring most commonly. Dominant species in the ground layer included <i>Waltheria indica</i> , Northern Kerosene Grass, Trefoil Rattlepod (<i>Crotalaria medicaginea</i>) and other native grasses. Grazing pressure within the ground layer was observed in this community. Moderate abundance of hollow bearing trees with sparse cover of deep leaf litter and fallen timber.

Survey site ID	Vegetation description
T3	River Red Gum woodland with Weeping Paperbark lined the banks of the Woolgar River while the channel comprised of bare sand with scattered shrubs and islands of Weeping Paperbark and log piles. Native and exotic grasses were present in the ground layer. Moderate abundance of hollow bearing trees, sparse leaf litter and fallen timber largely restricted to log piles. Moderate cover of weeds particularly Rubber Vine.
T4	Narrow-leaved Red Ironbark (<i>Eucalyptus crebra</i>) and Georgetown Box woodland. Other canopy species included, but were not limited to, Inland Bloodwood (<i>Corymbia terminalis</i>), Cooktown Ironwood, Lancewood (<i>Acacia shirleyi</i>), Jigal Tree, Arid Peach, Long-fruited Bloodwood and River Red Gum in gullies. The understory comprised younger canopy species, and a range of low trees and shrubs such as Smooth-leaved Quinine (<i>Petalostigma banksii</i>), Currant Bush, Red Ash (<i>Alphitonia excelsa</i>), Corkwood Wattle (<i>Vachellia sutherlandii</i>) and Broad-leaved Wilga (<i>Geijera salicifolia</i>). The ground layer was dominated by Gummy Spinifex (<i>Triodia pungens</i>) with other native grasses also present. Small rocks and pebbles covered the patchy ground layer. Some disturbance as a result of exploration activities has occurred in this community. Fire and grazing pressure were also observed. Weed abundance and the overall species richness and diversity was observed to be very low within this community. Moderate to sparse abundance of hollow bearing trees with sparse fallen timber and areas of deep leaf litter.
Early dry season survey	
T5	Georgetown Box woodland, with Long-fruited Bloodwood, Jigal Tree and <i>Acacia elachantha</i> . A variable shrub-layer with younger canopy species, and <i>Psyrax attenuata</i> (no common name), Smooth-leaved Quinine and Currant Bush. Wiregrasses (<i>Aristida spp.</i>) and other native grasses were common in the ground layer. There was a moderate abundance of hollow-bearing trees and areas of deep leaf litter. Fallen timber was sparse. A very low cover of weeds species was observed.

Survey site ID	Vegetation description
	

Survey site ID	Vegetation description
T6	Lower slope variant in broad overland flow path comprising woodland of Georgetown Box and Jigal Tree and Leichhardt Bean (<i>Cassia brewsteri</i>). Moderate abundance of hollow-bearing trees and some areas of deep leaf litter. The ground layer was comprised of various wiregrasses (<i>Aristida spp.</i>) and other native grasses, although the introduced Spiked Malvastrum (*<i>Malvastrum americanum</i> var. <i>americanum</i>) was common in the understorey. 

Survey site ID	Vegetation description
T7	Georgetown Box and Molly Red Box woodland with Long-fruited Bloodwood and Broad-leaved Carbeen. The mid-storey included <i>Acacia elachantha</i>, Smooth-leaved Quinine and Jigal Tree. The variable ground layer comprised mostly native species, including <i>Waltheria indica</i> (no common name), Northern Kerosene Grass and Trefoil Rattlepod. The introduced pasture grass, Indian Blue Grass (<i>*Bothriochloa pertusa</i>), was present in the ground layer. A sparse abundance of hollow-bearing trees was observed and a moderate abundance of fallen timber. Some areas of deep leaf litter were present. 

A3.7.3 Supplementary survey sites

A total of 52 supplementary survey sites were completed during the field surveys (Figure 4). Techniques employed at supplementary sites included spotlighting, call playback, infrared cameras, bird survey and/or active searching.

A description of the location, survey techniques and vegetation types of the supplementary survey sites is provided in Table A7.

Table A7: Description of supplementary survey sites

Survey site ID	Survey techniques	Vegetation description
Early wet season surveys		
S1	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Groundcover mostly native species.
S2	Active search and bird survey	Georgetown Box woodland with abundant Jigal Tree. Hollow-bearing trees and fallen timber is sparse and deep leaf litter largely absent. Groundcover mostly native species.
S3	Active search and bird survey	Low Georgetown Box and/or Molly Red Box woodland with Arid Peach on lower slopes and Hop Bush (<i>Dodonaea</i> spp.) in rocky areas. Moderate abundance of hollow-bearing trees. Sparse fallen timber and sparse deep leaf litter, abundant surface rock on slopes. Mostly native groundcover. Disturbed through erosion and historic mining.
S4	Active search and bird survey	Georgetown Box woodland with some scattered bloodwoods. Mid-storey of <i>Acacia elacantha</i> , Smooth-leaved Quinine and Jigal Tree. Sparse abundance of hollow-bearing trees. Moderate abundance of fallen timber. Some areas of deep leaf litter. Groundcover mostly native species.
S5	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, sparse fallen timber and sparse leaf litter. Groundcover mostly native species.
S6	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, sparse fallen timber and sparse areas of deep leaf litter. Groundcover mostly native species.

Survey site ID	Survey techniques	Vegetation description
S7	Active search and bird survey	Darwin Woollybutt forest with scattered bloodwood and mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Sparse hollow-bearing trees, fallen timber and very few areas of deep leaf litter. Dense regrowth, appears to have been heavily thinned in past.
S8	Active search and bird survey	Georgetown Box woodland with sparse hollow-bearing trees and fallen timber. Deep leaf litter is largely absent. Groundcover mostly native species.
S9	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, although fallen timber and deep leaf litter is sparse. Groundcover mostly native species.
S10	Active search and bird survey	Creek line fringed with River Red Gum. Moderate abundance of hollow-bearing trees. Sparse fallen timber and leaf litter.
S11	Active search and bird survey	Long-fruited Bloodwood open forest with other bloodwoods and a mid-dense understorey of Smooth-leaved Quinine, Red Ash and <i>Acacia elachantha</i> . Sparse hollow-bearing trees and fallen timber. Some areas of deep leaf litter. Groundcover virtually all native species.
S12	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, although fallen timber and deep leaf litter is sparse. Groundcover mostly native species.
S13	Active search and bird survey	Darwin Woollybutt open woodland on sandstone escarpment and plateaus with a shrub layer of <i>Acacias</i> , <i>Grevilleas</i> and various members of the <i>Fabaceae</i> and <i>Malvaceae</i> families. Moderate abundance of hollow-bearing trees, sparse fallen timber. Some areas of deep leaf litter and abundant surface rock with numerous nooks, crannies and overhangs. Groundcover mostly Gummy Spinifex.
S14	Active search and bird survey	Georgetown Box low open woodland on rocky skeletal soils. Hollow-bearing trees, fallen timber and areas of deep leaf litter were sparse. Abundant surface rock. Weeds virtually absent, some Gummy Spinifex. Disturbed through historical mining and some drilling.

Survey site ID	Survey techniques	Vegetation description
S15	Active search and bird survey	Inland Bloodwood low open forest a mid-dense understorey of Smooth-leaved Quinine, Red Ash and <i>Acacia elachantha</i> . Sparse hollow-bearing trees and fallen timber. Some areas of deep leaf litter. Groundcover virtually all native species.
S16	Active search and bird survey	Inland Bloodwood low open forest with other bloodwoods and a mid-dense understorey of Smooth-leaved Quinine, Red Ash and wattles. Sparse hollow-bearing trees and fallen timber. Some areas of deep leaf litter. Groundcover virtually all native species.
S17	Active search and bird survey	Georgetown Box open forest with a shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, sparse fallen timber and sparse areas of deep leaf litter. Groundcover mostly native species.
S18	Active search and bird survey	Molly Red Box woodland to open forest with a shrub layer of wattles with some patches of Currant Bush. Moderate abundance of hollow-bearing trees and areas of deep leaf litter. Sparse fallen timber. Very low cover of weeds.
S19	Active search and bird survey	Darwin Woollybutt forest with scattered bloodwood and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Dense regrowth, appears to have been heavily thinned in the past.
S20	Spotlight and call playback	Georgetown Box woodland with bloodwood. Mid-storey of wattles, Smooth-leaved Quinine and Jigal Tree. Sparse abundance of hollow-bearing trees. Moderate abundance of fallen timber. Some areas of deep leaf litter. Groundcover mostly native species.
S21	Spotlight and call playback	River Red Gum fringing Woolgar River. Moderate abundance of hollow-bearing trees.
S22	Spotlight and call playback	Rocky hillslope on the side of a scarp.
S23	Spotlight and call playback	Georgetown Box woodland with creek line downslope and some <i>Melaleuca</i> and River Red Gum along creek. Moderate to sparse abundance of hollow bearing trees, sparse fallen timber and areas of deep leaf litter virtually absent.

Survey site ID	Survey techniques	Vegetation description
S24	Spotlight and call playback	Darwin Woollybutt forest with scattered bloodwood and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Dense regrowth, appears to have been heavily thinned in the past.
S25	Spotlight and call playback	Stock dam, heavily used by cattle. Some Prickly Acacia (<i>Vachellia farnesiana</i>) nearby and Georgetown Box woodland.
S26	Spotlight and call playback	Darwin Woollybutt open woodland on sandstone escarpment and plateaus with a shrub layer of <i>Acacias</i> , <i>Grevilleas</i> and various members of the <i>Fabaceae</i> and <i>Malvaceae</i> families. Moderate abundance of hollow-bearing trees, sparse fallen timber. Some areas of deep leaf litter and abundant surface rock with numerous nooks, crannies and overhangs. Groundcover mostly Gummy Spinifex.
S27	Spotlight and call playback	River Red Gum fringing Woolgar River. Moderate abundance of hollow-bearing trees.
S28	Spotlight and call playback	Georgetown Box low open woodland on rocky skeletal soils, with Arid Peach. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Abundant surface rock. Weeds virtually absent, some Gummy Spinifex. Disturbed through historical mining and some drilling.
Early dry season surveys		
S29	Active search, bird survey, spotlight and call playback	Inland Bloodwood low open forest with bloodwoods and a mid-dense understorey of Smooth-leaved Quinine, Red Ash and <i>Acacia elachantha</i> . Sparse hollow-bearing trees and fallen timber. Some areas of deep leaf litter. Groundcover virtually all native species.
S30	Active search, bird survey, spotlight and call playback	Broad sandy creek line fringed with River Red Gum. Moderate abundance of hollow-bearing trees, some fallen timber and some areas of deep leaf litter.
S31	Spotlight and call playback	River Red gum fringing Woolgar River. Moderate abundance of hollow-bearing trees.
S32	Active search and bird survey	Inland Bloodwood low open forest with bloodwoods and a mid-dense understorey of Smooth-leaved Quinine, Red Ash and <i>Acacia elachantha</i> . Sparse hollow-bearing trees and fallen timber. Some areas of deep leaf litter. Groundcover virtually all native species.

Survey site ID	Survey techniques	Vegetation description
S33	Active search, bird survey, spotlight and call playback	Georgetown Box woodland to open forest with some bloodwoods. Dense understorey of Hop Bush. Abundant hollow-bearing trees. Sparse fallen timber and areas of deep leaf litter. Weeds virtually absent.
S34	Spotlight and call playback	Georgetown Box woodland with abundant Jigal Tree. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Groundcover mostly native species.
S35	Spotlight and call playback	Georgetown Box low stunted woodland with some Jigal Tree and Arid Peach on skeletal rocky soils. Numerous old workings, tracks and some drill pads. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Mostly native species in the ground layer.
S36	Active search, bird survey, spotlight and call playback	Georgetown Box open forest with a shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing trees, sparse fallen timber and sparse areas of deep leaf litter. Groundcover mostly native species.
S37	Active search and bird survey	Georgetown Box low woodland with Arid Peach on lower slopes and Hop Bush in rocky areas. Moderate abundance of hollow-bearing trees. Sparse fallen timber and areas of deep leaf litter, abundant surface rock on slopes. Mostly native groundcover. Disturbed through erosion and historic mining.
S38	Active search and bird survey	Georgetown Box low open woodland on rocky skeletal soils. Some Arid Peach also present. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Abundant surface rock. Weeds virtually absent, some Gummy Spinifex. Disturbed through historical mining and some drilling.
S39	Active search and bird survey	Darwin Woollybutt open woodland with some Georgetown Box on slopes of broken sandstone escarpment. Numerous rocky ledges and crannies. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Weeds virtually absent.
S40	Spotlight and call playback	Georgetown Box woodland on a rocky rise with skeletal soils. Small drainage line down slope with larger trees. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse.
S41	Active search, bird survey, spotlight and call playback	Darwin Woollybutt forest with scattered bloodwoods and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse. Dense regrowth, appears to have been heavily thinned in the past.

Survey site ID	Survey techniques	Vegetation description
S42	Active search and bird survey	Darwin Woollybutt open woodland on sandstone escarpment and plateaus with a shrub layer of <i>Acacias</i> , <i>Grevilleas</i> and various members of the <i>Fabaceae</i> and <i>Malvaceae</i> families. Moderate abundance of hollow-bearing trees, sparse fallen timber. Some areas of deep leaf litter and abundant surface rock with numerous nooks, crannies and overhangs. Groundcover mostly Gummy Spinifex.
S43	Active search and bird survey	Creek line fringed with River Red Gum. A moderate abundance of hollow-bearing trees. Sparse fallen timber and leaf litter.
S44	Spotlight and call playback	River Red Gum fringed creek with some <i>Melaleuca</i> species. Moderate abundance of hollow-bearing, sparse fallen timber and sparse areas of deep leaf litter.
S1	Active search and bird survey	Georgetown Box open forest with shrub layer of Currant Bush, <i>Acacia</i> and some <i>Melaleuca</i> species. Low abundance of hollow-bearing trees, moderate fallen timber and sparse areas of deep leaf litter. Groundcover mostly native species.
S2	Active search and bird survey	River Red Gum fringing Woolgar River. Moderate abundance of hollow-bearing trees. Shrub layer and groundcover dominated by Rubber Vine
S3	Active search and bird survey	Georgetown Box low open woodland on rocky skeletal soils. Dense shrub layer dominated by Currant Bush, groundcover predominately native. Low to moderate abundance of hollow-bearing trees, moderate abundance of fallen timber, some areas of deep leaf litter
S4	Active search and bird survey	Molly Red Box woodland to open forest with a shrub layer of wattles with some patches of Currant Bush. Sparse abundance of hollow-bearing trees and moderate areas of deep leaf litter. Moderate abundance of fallen timber. Very low cover of weeds.
S5	Active search and bird survey	Molly Red Box woodland to open forest with a shrub layer of wattles with some patches of Currant Bush. Sparse abundance of hollow-bearing trees and moderate areas of deep leaf litter. Moderate abundance of fallen timber. Very low cover of weeds.
S10	Active search, bird survey, spotlight and call playback	Darwin Woollybutt forest with scattered bloodwoods and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse.

Survey site ID	Survey techniques	Vegetation description
S11	Active search and bird survey	Darwin Woollybutt forest with scattered bloodwoods and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Sparse hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse.
S12	Spotlight and call playback	Darwin Woollybutt forest with scattered bloodwoods and a mid-dense shrub layer of Smooth-leaved Quinine and <i>Acacia</i> species. Sparse hollow-bearing trees, fallen timber and areas of deep leaf litter are sparse.
S19	Active search and bird survey	River Red Gum island within the Woolgar River with <i>Melaleuca</i> understory. Moderate abundance of hollow-bearing trees, sparse to moderate abundance of deep leaf litter and fallen timber.

A3.7.4 Spotlighting

Spotlighting was undertaken by two ecologists on foot for a total of 30 hours generally in an area within 300 m of each of the following trap sites or supplementary sites: T1 – T7, S20 – S28 in 2017, S29, S30, S31, S33, S34, S35, S36, S40, S41 and S44 in 2019, and S10 and S12 in 2021. The 30 hours consisted of 7 person hours at the 7 systematic trap sites and 23 person hours at 21 of the supplementary sites (Tables A5 and A7). Spotlighting was also undertaken from a slow-moving vehicle for a total of 51.5 person hours along tracks where it was safe to do so. Fauna was located from eye shine or direct observation and identified. The distinctive calls of some fauna were also used to identify their presence.

A3.7.5 Call playback

Call playback involved broadcasting a recorded call of an owl or arboreal mammal through a megaphone in an effort to elicit a territorial response from any animals that hear the call. Animals either call in response to the recording and/or move into the location that the call was played from. The call is played and then approximately 2 to 3 minutes are spent listening for a response and looking for animals that have moved into the area without calling. Call playback was undertaken in the vicinity of each systematic trap site and 21 supplementary sites, totalling 28 sessions over both surveys. Following the call playback session, spotlighting was conducted in the immediate area to locate any owls that had flown into the area without calling and had not been seen during the call playback.

The calls of the following species were played:

- Barking Owl (*Ninox connivens*)
- Southern Boobook (*Ninox novaeseelandiae*)
- Barn Owl (*Tyto alba*)

- Koala (*Phascolarctos cinereus*).

A3.7.6 Bird surveys

During the checking of traps at each systematic trap site, bird surveys were conducted along the trap transect, with records made of all birds seen and heard. The order in which systematic trap sites were checked varied each morning to ensure that sites were surveyed for birds at slightly different times each day. Five person hours were spent in total at each of the 7 systematic trap sites (i.e. 35 person hours in total) and 1-person hour was spent conducting bird surveys at 38 supplementary sites resulting in a total survey time of 70 person hours. An additional 90 person hours were spent surveying specifically for the Black-throated Finch at 4 water points in the project site (BTF1-4, Figure 4). Survey hours at each of these water points ranged from 3 to 10.5 person hours each day with BTF survey points 1 and 2 duplicated over two consecutive days. Water points included dams, cattle troughs and pooled water within the Woolgar River. Only Water points 1 and 2 were observed to hold water during both the seasonal surveys.

Opportunistic records of birds were also made while undertaking other activities throughout the project site. Approximately 396 person hours were spent undertaking opportunistic diurnal and nocturnal bird observations during the seasonal field surveys.

A3.7.7 Active searches

Active searching was conducted to detect reptiles, frogs and small ground dwelling mammals. It involved the searching of suitable microhabitat such as logs, bark, deep leaf litter, surface rocks and shedding bark. Active searching was undertaken for 37 person hours, which included 1-person hour at each systematic trap site and 1-person hour at 38 supplementary sites (Tables A5 and A7).

A3.7.8 Anabat

The Anabat surveys involved the use of an Anabat detector to record the echolocation calls of micro bats as they forage. A sonogram was then produced using software that allows for comparison against reference calls for identification. Unfortunately, some species of bat have very similar and/or quiet calls and cannot be positively distinguished via Anabat (e.g. *Nyctophilus* species). Therefore, a probability rating is provided for calls identified. All Anabat calls were analysed by Greg Ford, a specialist in analysing Anabat recordings.

Anabat units were deployed for one night from dusk until dawn at 23 locations (Figure 4) and survey effort totalled 23 nights. In addition to this survey effort and which is outlined in Table A5, another 4 Anabat units were installed between 5 and 8 km east of the project site for 3 nights in April 2021 (as part of an expanded study area), equating to another 12 detector nights. Anabat survey sites were selected on the basis of having suitable flyways, flowering trees that attract insects or water that attracts insects and bats.

A3.7.9 Harp traps

Harp traps were used to capture bats during the survey and were set at four locations within the project site (Table A5) (Figure 4). One harp trap was set at each location for two nights during the surveys, with the exception of two harp trap sites (H1 and H3 on Figure 4), where two harp traps were set up. This gave a total of 10 harp trap nights over the seasonal surveys. Harp traps were located in suitable flyways such as small waterways or tracks. Harp traps comprise two banks of vertical microfilament line offset from one another. Bats fly into one of these wires and drop into a bag beneath the trap where they can be collected for identification. Captured bats were kept in a quiet cool location and released on the night following their capture.

A3.7.10 Camera traps

A Reconyx HC500 infrared camera was set up at each of the four early wet season systematic trap sites and an additional two sites (C1 to C6 on Figure 4).

Long-term cameras (C7 to C106 on Figure 4) were set at 100 sites throughout the project site and left for between 15 and 21 nights, equating to 1,788 camera nights. The cameras were set on a bait station of chicken legs. Approximately 128 nights of recording was ineffective from a number of cameras primarily due to cattle disturbance, whereby the camera was knocked, shifting the field of view into the tree canopy or sky.

A3.7.11 Koala transects and SAT sites

Koala transects and Spot Assessment Techniques (SAT) searches were stratified across the project site (Figure 4). Seven Koala transects were undertaken, whereby two ecologists walking a distance of 25 m apart for a nominated length, usually at least 500 m, on one side of a centreline and then returning along the other side of the 500 m centreline also remaining a distance of 25 m apart, while inspecting each tree along this transect. Approximately 9.3 km of transects were undertaken across seven transects, located throughout the project site and this approach resulted in a total search area of approximately 93 ha across the seven transects.

A total of 22 SAT sites were undertaken in potential habitat, some coincided with each end of Koala transects. Each SAT survey involved searching the base of 30 trees for characteristic Koala scats (Phillips and Callaghan 2011).

A3.7.12 Opportunistic observations

Records of fauna were also made opportunistically while undertaking other activities, such as moving between trap sites, throughout the survey period.

A3.7.13 Habitat assessment

The quality of fauna habitat in the project site was assessed on the basis of the following criteria:

- **Low:** Many fauna habitat elements in low quality areas have been removed or altered such as mature, hollow-bearing trees, fallen timber and deep leaf litter. Remnants are often small in size, support substantial weed infestations of high or moderate threat weeds (e.g. Rubber Vine (**Cryptostegia grandiflora*)) and are poorly connected to other areas of remnant vegetation.
- **Moderate:** Some habitat components are present but others are lacking. For example a remnant may have a reasonably intact understorey but lack mature canopy species and fallen timber. Some weed infestations are present but are relatively small in size or comprise species of low to moderate threat. Linkages with other remnant habitats in the landscape may be lacking or somewhat tenuous.
- **High:** Most habitat components are present (e.g. old-growth trees, fallen timber, lack of weeds and deep leaf litter), the remnant is large enough to support species that are typically associated with large intact areas of habitat and it is well connected or contiguous with other areas of native vegetation.

These criteria were adapted for treeless habitat types such as wetlands as appropriate.

A4 Field survey standards

A number of guidelines have been consulted in the development of methods for the field surveys, particularly with regard to survey timing and techniques employed to target threatened and migratory species most likely to occur within the project site.

Threatened species survey guidelines used to inform the requirements of the terrestrial flora and fauna surveys in the project site included:

- Commonwealth guidelines:
 - *Survey guidelines for Australia's threatened birds* (DEWHA 2010a)
 - *Survey guidelines for Australia's threatened bats* (DEWHA 2010b)
 - *Survey guidelines for Australia's threatened reptiles* (SEWPaC 2011a)
 - *Survey guidelines for Australia's threatened mammals* (SEWPaC 2011b)
 - Species Profile and Threats (SPRAT) databases for relevant EPBC Act listed species and communities.
- Queensland guidelines:
 - Flora Survey Guidelines (DES 2020b; EHP 2016)
 - Qld Fauna Survey Guidelines (Queensland Herbarium 2018).

The Commonwealth guidelines provide specific survey guidelines for individual threatened flora and fauna species listed under the EPBC Act, while the Queensland survey guidelines provide general guidance on the survey methodology and minimum effort advice for detection of all species. For all target species, a combination of two or more recommended survey techniques were employed.

A5 Likelihood of occurrence

A5.1 Ecological community assessment

Flora surveys were conducted at a scale and intensity to sufficiently identify regional ecosystems (REs) present. REs not recorded during the field surveys were therefore considered to have a low likelihood to occur within the assessment area.

An assessment of impacts was undertaken for REs identified as present within the assessment area during the field surveys.

A5.2 Significant species assessment

Database searches identified threatened, near threatened and special least concern species that potentially occur in the project site. The likelihood of these species occurring was then assessed based on the results of the field surveys.

The likelihood of species occurring in the project site was classified using the criteria presented in Table A8. The assessment was based on the species' known ranges and habitat preferences, which were assessed against the characteristics of the project site observed during field surveys.

Table A8: Criteria to assess potential for species to occur in the project site

Likelihood to occur	Definition
Present	The species was recorded within the project site during the field surveys.
Likely	The species was not recorded within or adjacent to the project site during the field surveys but is known to occur within the surrounding area, and habitat of suitable quality exists within the project site.
Unlikely	The species was not recorded within or adjacent to the project site during the field surveys. The species is either: a) unlikely to occur in the wider region and due to the lack of, or extremely poor quality habitat in the project site, the species is not expected to occur in the project site; or b) may forage periodically in the wider region and may overfly the project site, but the habitat in the project site is generally not suitable.

A6 Habitat mapping

Fauna habitat mapping was undertaken for the project site based on the Herbarium vegetation mapping developed for the project site, in conjunction with fauna habitat values such as structural diversity, ground cover, micro-habitat features including abundance of fallen logs and hollows, flora species diversity and aquatic features assessed during the field surveys. Vegetation of similar structure, with similar landscape features or comprising similar flora groups were combined to develop broad habitat types throughout the project site.

These broad habitat types were then used to identify potential threatened species habitats in the project site. The broad habitat mapping was used along with information on known habitat preferences for threatened species, derived from sources such as Queensland DES profiles, other published literature, field observations from the project site and previous experience with the relevant species, where applicable.

A7 Assessment of impacts

For MSES listed under the Queensland EO Act, the significance of impacts was assessed in accordance with the Queensland Significant Residual Impact Guideline (SRI Guideline) (EHP 2014).

A conservative approach was adopted whereby significance assessments for residual MSES (i.e. an assessment of impacts using the SRI Guideline) were conducted for all MSES species and vegetation communities that were recorded as present, or assessed as having a high or moderate likelihood to be present in the project site.

A8 Limitations

The seasonal surveys were conducted in line with the recommended survey timing in the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland, which recommends surveys between November and January and again between May and July for the Gulf Plains Bioregion (Eyre et al. 2014).

The early wet season survey in 2017 was conducted when conditions were suitable for the detection of all classes of fauna due to warm night time temperatures and storms with some rainfall experienced during and leading up to the survey. However, the drier conditions experienced in the area prior to the survey resulted in reduced grass cover and seed. The early dry season survey period in 2019 was undertaken during mild conditions, cool conditions in the weeks leading up to the survey, which may have affected fauna activity in the project site during the survey, as activity was found to be generally low across all fauna groups. Sitting water was limited to sporadic pools in the Woolgar River and the dams shown on Figure 4.

Dry conditions during and leading up to the early wet season surveys resulted in a reduced level of observed flora species richness and plant vigour. Nonetheless, the early dry season surveys allowed for expansion of the flora species inventory for the project site and provided good conditions for the detection of most flora species. Reproductive material was present on most grasses and forbs during surveys, thereby enabling positive identification. Substantial rainfall during the months leading up to the early dry season surveys in 2016, 2019 and 2021 created optimal survey conditions.

Nonetheless, ecological survey often fails to record all species of flora and fauna present in a study area for a variety of reasons, including seasonal absence, large home ranges, reduced activity or lack of reproductive material for flora during certain seasons. Furthermore, the ecology and nature of some significant and/or cryptic species means that such species are potentially not recorded during short survey periods. This assessment overcomes these limitations by assessing impacts not only on species recorded during the field surveys, but also on species that are assessed as potentially present (based on known distribution and habitat availability).

Appendix B

Database search results



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 19-Jan-2026

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	25
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	4
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	1
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

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

Community Name	Threatened Category	Presence Text
The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	Endangered	Community likely to occur within 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
BIRD		
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Chloebia gouldiae listed as Erythrura gouldiae Gouldian Finch [90091]	Endangered	Species or species habitat may occur within area
Erythroriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area
Petauroides minor Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat may occur within area
Rhinolophus robertsi Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Sminthopsis douglasi Julia Creek Dunnart [305]	Vulnerable	Species or species habitat may occur within area
PLANT		
Acacia crombiei Pink Gidgee [10927]	Vulnerable	Species or species habitat known to occur within area
Cycas platyphylla a cycad [55796]	Vulnerable	Species or species habitat may occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Euphorbia carissoides [12431]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Acanthophis hawkei Plains Death Adder [83821]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Varanus mertensi Mertens' Water Monitor [1568]	Endangered	Species or species habitat may occur within area
SHARK		
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		

Scientific Name	Threatened Category	Presence Text
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato)		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area

Reptile		
Crocodylus johnstoni		
Freshwater Crocodile, Johnston's Crocodile, Johnstone's Crocodile [1773]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	
Bellfield	Nature Refuge	QLD	
Gilberton	Nature Refuge	QLD	
Rungulla	Resources Reserve	QLD	
Rungulla	National Park	QLD	

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	

Bioregional Assessments			[Resource Information]
SubRegion	BioRegion	Website	
Galilee	Lake Eyre Basin	BA website	

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 is 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 on the contents of this report.

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 point locations and environmental data layers.

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 when time permits.

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 breeding sites; and
- 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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Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111

WildNet Online Database Search: 19 January 2026

WN Taxon ID	Scientific name	NCA status	EPBC status
1785	<i>Geophaps scripta scripta</i>	V	V
14904	<i>Acacia crombiei</i>	V	V
11957	<i>Drummondita calida</i>	V	
1965	<i>Apus pacificus</i>	SL	
838	<i>Tachyglossus aculeatus</i>	SL	
17819	<i>Blechnum orientale</i>	SL	
8346	<i>Wahlenbergia tumidifructa</i>	SL	
17345	<i>Drosera burmanni</i>	SL	
17347	<i>Drosera lanata</i>	SL	
9417	<i>Utricularia gibba</i>	SL	
16382	<i>Psilotum nudum</i>	SL	
18110	<i>Acrostichum speciosum</i>	SL	
41591	<i>Pteris platyzomopsis</i>	SL	
12647	<i>Brachychiton paradoxus</i>	SL	
16111	<i>Stylidium eriorhizum</i>	SL	
16112	<i>Stylidium floodii</i>	SL	
12561	<i>Stylidium rotundifolium</i>	SL	
17504	<i>Cyclosorus interruptus</i>	SL	
15934	<i>Xanthorrhoea johnsonii</i>	SL	
13851	<i>Labichea brassii</i>	NT	
31854	<i>Kardomia squarrulosa</i>	NT	
1365	<i>Poephila cincta cincta</i>	E	E
860	<i>Phascolarctos cinereus</i>	E	E
643	<i>Cyclorana brevipes</i>	C	
620	<i>Cyclorana novaehollandiae</i>	C	
627	<i>Litoria caerulea</i>	C	
612	<i>Litoria inermis</i>	C	
614	<i>Litoria latopalmata</i>	C	
600	<i>Litoria rubella</i>	C	
680	<i>Platyplectrum ornatum</i>	C	
636	<i>Uperoleia lithomoda</i>	C	
1419	<i>Acanthiza chrysorrhoa</i>	C	
1407	<i>Gerygone fusca</i>	C	
1396	<i>Gerygone olivacea</i>	C	
1371	<i>Smicrornis brevirostris</i>	C	
1742	<i>Accipiter cirrocephalus</i>	C	
1729	<i>Accipiter fasciatus</i>	C	
1732	<i>Aquila audax</i>	C	
1721	<i>Aviceda subcristata</i>	C	
1707	<i>Haliastur sphenurus</i>	C	
1973	<i>Aegotheles cristatus</i>	C	
1766	<i>Dacelo leachii</i>	C	
1767	<i>Dacelo novaeguineae</i>	C	
1760	<i>Todiramphus macleayi</i>	C	
1761	<i>Todiramphus pyrrhopygius</i>	C	

1762	<i>Todiramphus sanctus</i>	C
1993	<i>Anas gracilis</i>	C
1978	<i>Dendrocygna eytoni</i>	C
1987	<i>Stictonetta naevosa</i>	C
1829	<i>Ardea alba modesta</i>	C
1826	<i>Egretta novaehollandiae</i>	C
1658	<i>Artamus cinereus</i>	C
1660	<i>Artamus leucorhynchus</i>	C
1646	<i>Artamus minor</i>	C
1647	<i>Artamus personatus</i>	C
1649	<i>Artamus superciliosus</i>	C
1654	<i>Cracticus nigrogularis</i>	C
1656	<i>Cracticus torquatus</i>	C
1644	<i>Gymnorhina tibicen</i>	C
1645	<i>Strepera graculina</i>	C
1956	<i>Burhinus grallarius</i>	C
1191	<i>Cacatua galerita</i>	C
1196	<i>Calyptorhynchus banksii</i>	C
22492	<i>Calyptorhynchus banksii banksii</i>	C
1193	<i>Eolophus roseicapilla</i>	C
1635	<i>Coracina maxima</i>	C
1636	<i>Coracina novaehollandiae</i>	C
1637	<i>Coracina papuensis</i>	C
1639	<i>Edolisoma tenuirostre</i>	C
1642	<i>Lalage tricolor</i>	C
1975	<i>Caprimulgus macrurus</i>	C
1940	<i>Elseyaornis melanops</i>	C
1942	<i>Erythrogonys cinctus</i>	C
27774	<i>Vanellus miles</i>	C
18143	<i>Vanellus tricolor</i>	C
1294	<i>Cisticola exilis</i>	C
1628	<i>Climacteris picumnus</i>	C
1809	<i>Geopelia cuneata</i>	C
18323	<i>Geopelia placida</i>	C
18439	<i>Geophaps scripta peninsulae</i>	C
1793	<i>Ocyphaps lophotes</i>	C
1795	<i>Phaps chalcoptera</i>	C
1779	<i>Eurystomus orientalis</i>	C
1605	<i>Struthidea cinerea</i>	C
1608	<i>Corvus coronoides</i>	C
1609	<i>Corvus orru</i>	C
1610	<i>Corvus sp.</i>	C
1751	<i>Centropus phasianinus</i>	C
1738	<i>Eudynamis orientalis</i>	C
1740	<i>Scythrops novaehollandiae</i>	C
1611	<i>Dicaeum hirundinaceum</i>	C
1369	<i>Neochmia modesta</i>	C

1363	Poephila cincta	C
1342	Taeniopygia bichenovii	C
1343	Taeniopygia guttata	C
1716	Falco berigora	C
1692	Falco peregrinus macropus	C
1678	Antigone rubicunda	C
1292	Cincloramphus mathewsi	C
18459	Malurus assimilis	C
1558	Malurus melanocephalus	C
1552	Acanthagenys rufogularis	C
1537	Conopophila rufogularis	C
1539	Entomyzon cyanotis	C
1496	Gavicalis virescens	C
1497	Lichmera indistincta	C
1499	Manorina flavigula	C
1507	Melithreptus albogularis	C
1493	Philemon citreogularis	C
1494	Philemon corniculatus	C
1471	Plectorhyncha lanceolata	C
1511	Stomiopera flava	C
1764	Merops ornatus	C
1589	Grallina cyanoleuca	C
1600	Myiagra inquieta	C
1586	Myiagra rubecula	C
1453	Daphoenositta chrysoptera	C
1431	Oreoica gutturalis	C
1442	Oriolus sagittatus	C
1680	Ardeotis australis	C
1449	Colluricincla harmonica	C
1437	Pachycephala rufiventris	C
1390	Pardalotus rubricatus	C
1392	Pardalotus striatus	C
1339	Microeca fascinans	C
1263	Phalacrocorax sulcirostris	C
1955	Podargus strigoides	C
1249	Tachybaptus novaehollandiae	C
1318	Pomatostomus temporalis	C
1182	Aprosmictus erythropterus	C
1151	Melopsittacus undulatus	C
1136	Platycercus adscitus	C
1125	Trichoglossus moluccanus	C
1160	Chlamydera maculata	C
1161	Chlamydera nuchalis	C
1893	Himantopus leucocephalus	C
1575	Rhipidura albiscapa	C
1576	Rhipidura leucophrys	C
1102	Ninox boobook	C

1006	<i>Saccolaimus flaviventris</i>	C
1013	<i>Taphozous troughtoni</i>	C
903	<i>Osphranter robustus</i>	C
905	<i>Osphranter rufus</i>	C
955	<i>Miniopterus orianae oceanensis</i>	C
996	<i>Chaerephon jobensis</i>	C
22062	<i>Mormopterus eleryi</i>	C
998	<i>Mormopterus lumsdenae</i>	C
988	<i>Mormopterus sp.</i>	C
36762	<i>Petaurus notatus</i>	C
968	<i>Rhinolophus megaphyllus</i>	C
972	<i>Chalinolobus gouldii</i>	C
973	<i>Chalinolobus morio</i>	C
961	<i>Chalinolobus nigrogriseus</i>	C
949	<i>Chalinolobus sp.</i>	C
938	<i>Nyctophilus sp.</i>	C
945	<i>Scotorepens balstoni</i>	C
931	<i>Scotorepens greyii</i>	C
924	<i>Vespadelus finlaysoni</i>	C
567	<i>Diporiphora australis</i>	C
36209	<i>Amalosia queenslandia</i>	C
426	<i>Lucasium steindachneri</i>	C
399	<i>Oedura castelnaui</i>	C
482	<i>Denisonia devisi</i>	C
488	<i>Furina ornata</i>	C
34446	<i>Pseudonaja nuchalis</i>	C
420	<i>Gehyra dubia</i>	C
413	<i>Heteronotia binoei</i>	C
323	<i>Delma tincta</i>	C
325	<i>Lialis burtonis</i>	C
294	<i>Carlia munda</i>	C
31897	<i>Cryptoblepharus metallicus</i>	C
283	<i>Cryptoblepharus pannosus</i>	C
251	<i>Ctenotus ingrami</i>	C
256	<i>Ctenotus leonhardii</i>	C
259	<i>Ctenotus pantherinus</i>	C
240	<i>Ctenotus spaldingi</i>	C
166	<i>Lerista emmotti</i>	C
143	<i>Lerista sp.</i>	C
127	<i>Menetia greyii</i>	C
138	<i>Morethia taeniopleura</i>	C
126	<i>Notoscincus ornatus</i>	C
78	<i>Varanus gouldii</i>	C
59	<i>Varanus storri</i>	C
60	<i>Varanus tristis</i>	C
17767	<i>Brunoniella australis</i>	C
14367	<i>Nelsonia campestris</i>	C

18101	<i>Achyranthes aspera</i>	C
14527	<i>Gomphrena flaccida</i>	C
12386	<i>Gomphrena lanata</i>	C
17979	<i>Alyxia spicata</i>	C
17689	<i>Carissa lanceolata</i>	C
15929	<i>Wrightia saligna</i>	C
12977	<i>Lemna aequinoctialis</i>	C
11224	<i>Astrotricha pterocarpa</i>	C
12115	<i>Hydrocotyle grammatocarpa</i>	C
36450	<i>Lomandra decomposita</i>	C
16777	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	C
14885	<i>Adenostemma lavenia</i>	C
33860	<i>Adenostemma lavenia</i> var. <i>lavenia</i>	C
12285	<i>Blumea saxatilis</i>	C
29558	<i>Coronidium glutinosum</i>	C
22237	<i>Cyanthillium cinereum</i>	C
10999	<i>Olearia xerophila</i>	C
15131	<i>Pterocaulon sphacelatum</i>	C
11241	<i>Dolichandrone alternifolia</i>	C
5843	<i>Heliotropium tabuliplagae</i>	C
16983	<i>Heliotropium tenuifolium</i>	C
9303	<i>Canarium australianum</i> var. <i>velutinum</i>	C
29618	<i>Seringia adenolasia</i>	C
29613	<i>Seringia collina</i>	C
15922	<i>Waltheria indica</i>	C
17726	<i>Capparis lasiantha</i>	C
11374	<i>Polycarpaea corymbosa</i>	C
16385	<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>	C
34775	<i>Denhamia cunninghamii</i>	C
33924	<i>Salsola australis</i>	C
9730	<i>Sclerolaena bicornis</i>	C
9056	<i>Terminalia aridicola</i>	C
9037	<i>Terminalia aridicola</i> subsp. <i>chillagoensis</i>	C
13765	<i>Terminalia oblongata</i> subsp. <i>volucris</i>	C
16027	<i>Terminalia platyphylla</i>	C
9886	<i>Bonamia media</i>	C
35535	<i>Bonamia multiflora</i>	C
17176	<i>Evolvulus alsinoides</i>	C
17175	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	C
16867	<i>Ipomoea</i>	C
16881	<i>Jacquemontia paniculata</i> var. <i>tomentosa</i>	C
7569	<i>Polymeria lanata</i>	C
15888	<i>Xenostegia tridentata</i>	C
8466	<i>Callitris intratropica</i>	C
41593	<i>Sphaeropteris cooperi</i>	C
17510	<i>Cyperus aquatilis</i>	C
10520	<i>Cyperus cristulatus</i>	C

17514	<i>Cyperus decompositus</i>	C
17515	<i>Cyperus difformis</i>	C
14656	<i>Cyperus exaltatus</i>	C
13966	<i>Cyperus flaccidus</i>	C
9443	<i>Cyperus haspan</i>	C
10209	<i>Cyperus holoschoenus</i>	C
14664	<i>Cyperus lucidus</i>	C
13968	<i>Cyperus nervulosus</i>	C
12420	<i>Cyperus polystachyos</i>	C
9813	<i>Eleocharis atropurpurea</i>	C
17343	<i>Eleocharis sphacelata</i>	C
10165	<i>Eleocharis tetraquetra</i>	C
27260	<i>Fimbristylis blakei</i>	C
11968	<i>Fimbristylis caespitosa</i>	C
10175	<i>Fimbristylis complanata</i>	C
17107	<i>Fimbristylis dichotoma</i>	C
11040	<i>Fimbristylis littoralis</i>	C
14566	<i>Fimbristylis microcarya</i>	C
14510	<i>Fimbristylis nuda</i>	C
17109	<i>Fimbristylis nutans</i>	C
17130	<i>Fuirena ciliaris</i>	C
17076	<i>Fuirena incrassata</i>	C
17077	<i>Fuirena umbellata</i>	C
17078	<i>Gahnia aspera</i>	C
41293	<i>Machaerina rubiginosa</i>	C
12193	<i>Rhynchospora pterochaeta</i>	C
35913	<i>Schoenoplectiella lateriflora</i> var. <i>lateriflora</i>	C
35597	<i>Schoenoplectiella mucronata</i>	C
11902	<i>Schoenus kennyi</i>	C
16220	<i>Scleria brownii</i>	C
16224	<i>Scleria sphacelata</i>	C
11557	<i>Hibbertia lepidota</i>	C
9359	<i>Bergia pusilla</i>	C
11601	<i>Bergia trimera</i>	C
22320	<i>Eriocaulon athertonense</i>	C
11338	<i>Eriocaulon cinereum</i>	C
17289	<i>Erythroxylum ellipticum</i>	C
4789	<i>Euphorbia mitchelliana</i>	C
4742	<i>Euphorbia petala</i>	C
22073	<i>Microstachys chamaelea</i>	C
14675	<i>Dampiera adpressa</i>	C
17057	<i>Goodenia armitiana</i>	C
11010	<i>Goodenia gracilis</i>	C
17063	<i>Goodenia hirsuta</i>	C
10697	<i>Goodenia janamba</i>	C
26456	<i>Goodenia redacta</i>	C
2048	<i>Goodenia rosulata</i>	C

17000	<i>Haemodorum coccineum</i>	C
17052	<i>Gonocarpus acanthocarpus</i>	C
15283	<i>Hypericum gramineum</i>	C
16844	<i>Juncus continuus</i>	C
16846	<i>Juncus usitatus</i>	C
29546	<i>Hemigenia</i> sp. (White Mountains D.G.Fell DF1379)	C
14070	<i>Acacia adsurgens</i>	C
11883	<i>Acacia bivenosa</i>	C
15783	<i>Acacia cambagei</i>	C
15787	<i>Acacia chisholmii</i>	C
18207	<i>Acacia colei</i> var. <i>colei</i>	C
22883	<i>Acacia delicatula</i>	C
14907	<i>Acacia dietrichiana</i>	C
2067	<i>Acacia elachantha</i>	C
14065	<i>Acacia excelsa</i> subsp. <i>excelsa</i>	C
15748	<i>Acacia galioides</i>	C
11540	<i>Acacia gonoclada</i>	C
15751	<i>Acacia hammondii</i>	C
15753	<i>Acacia hemignosta</i>	C
15755	<i>Acacia holosericea</i>	C
7557	<i>Acacia julifera</i> subsp. <i>curvinervia</i>	C
7559	<i>Acacia julifera</i> subsp. <i>gilbertensis</i>	C
14076	<i>Acacia laccata</i>	C
15763	<i>Acacia lazaridis</i>	C
15767	<i>Acacia leptostachya</i>	C
15721	<i>Acacia melleodora</i>	C
15725	<i>Acacia multisiliqua</i>	C
15732	<i>Acacia orthocarpa</i>	C
15738	<i>Acacia platycarpa</i>	C
15696	<i>Acacia shirleyi</i>	C
15701	<i>Acacia stipuligera</i>	C
15703	<i>Acacia tenuissima</i>	C
15706	<i>Acacia torulosa</i>	C
11537	<i>Acacia tropica</i>	C
31404	<i>Acacia victoriae</i> subsp. <i>fasciaria</i>	C
9797	<i>Acacia victoriae</i> subsp. <i>victoriae</i>	C
15661	<i>Adenanthera abrosperma</i>	C
14789	<i>Bossiaea armitii</i>	C
18868	<i>Chamaecrista longipes</i>	C
3053	<i>Chamaecrista symonii</i>	C
26436	<i>Crotalaria medicaginea</i> var. <i>linearis</i>	C
15473	<i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i>	C
22316	<i>Crotalaria ramosissima</i>	C
18127	<i>Cullen leucanthum</i>	C
13936	<i>Dichrostachys spicata</i>	C
15335	<i>Erythrophleum chlorostachys</i>	C
42643	<i>Grona filiformis</i>	C

25985	<i>Hovea apiculata</i>	C
22169	<i>Hovea parvicalyx</i>	C
15292	<i>Indigofera colutea</i>	C
15294	<i>Indigofera hirsuta</i>	C
15295	<i>Indigofera linifolia</i>	C
15297	<i>Indigofera pratensis</i>	C
10982	<i>Jacksonia odontoclada</i>	C
15259	<i>Jacksonia ramosissima</i>	C
10850	<i>Labichea rupestris</i>	C
15233	<i>Lysiphyllum carronii</i>	C
14421	<i>Lysiphyllum cunninghamii</i>	C
15234	<i>Lysiphyllum hookeri</i>	C
15195	<i>Mirbelia viminalis</i>	C
9173	<i>Rhynchosia minima</i> var. <i>australis</i>	C
15064	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>	C
15071	<i>Senna costata</i>	C
15533	<i>Senna notabilis</i>	C
18750	<i>Sesbania cannabina</i>	C
15021	<i>Tephrosia juncea</i>	C
10809	<i>Tephrosia leptoclada</i>	C
42107	<i>Tephrosia lithosperma</i>	C
14998	<i>Uraria lagopodioides</i>	C
30907	<i>Vachellia bidwillii</i>	C
31037	<i>Vachellia sutherlandii</i>	C
13737	<i>Zornia adenophora</i>	C
13734	<i>Zornia muriculata</i>	C
10739	<i>Zornia prostrata</i> var. <i>prostrata</i>	C
9823	<i>Lindsaea ensifolia</i>	C
14456	<i>Lindsaea ensifolia</i> subsp. <i>ensifolia</i>	C
12580	<i>Mitrasacme connata</i>	C
13056	<i>Amyema quandang</i> var. <i>quandang</i>	C
10914	<i>Amyema villiflora</i> subsp. <i>tomentilla</i>	C
16743	<i>Lysiana spathulata</i> subsp. <i>spathulata</i>	C
41045	<i>Palhinhaea cernua</i>	C
11979	<i>Ammannia multiflora</i>	C
22202	<i>Abutilon fraseri</i> subsp. <i>fraseri</i>	C
13293	<i>Abutilon otocarpum</i>	C
17068	<i>Gossypium australe</i>	C
13204	<i>Gossypium nelsonii</i>	C
8393	<i>Herissantia crispa</i>	C
16957	<i>Hibiscus meraukensis</i>	C
12960	<i>Hibiscus pentaphyllus</i>	C
16960	<i>Hibiscus sturtii</i>	C
22197	<i>Sida hackettiana</i>	C
12920	<i>Sida magnifica</i>	C
22289	<i>Sida rohlenae</i> subsp. <i>rohlenae</i>	C
29908	<i>Sida</i> sp. (Gordonbrook Station E.J.Thompson+ MUT46)	C

15998	<i>Tinospora smilacina</i>	C
17144	<i>Ficus opposita</i>	C
17950	<i>Asteromyrtus symphyocarpa</i>	C
42240	<i>Blakella confertiflora</i>	C
42430	<i>Blakella gilbertensis</i>	C
42288	<i>Blakella leichhardtii</i>	C
17761	<i>Calytrix exstipulata</i>	C
17763	<i>Calytrix leptophylla</i>	C
17765	<i>Calytrix microcoma</i>	C
6534	<i>Corymbia clarksoniana</i>	C
6532	<i>Corymbia polycarpa</i>	C
27688	<i>Corymbia serendipita</i>	C
21928	<i>Corymbia setosa</i>	C
6555	<i>Corymbia setosa</i> subsp. <i>setosa</i>	C
6421	<i>Corymbia terminalis</i>	C
17247	<i>Eucalyptus camaldulensis</i>	C
32998	<i>Eucalyptus camaldulensis</i> subsp. <i>acuta</i>	C
32977	<i>Eucalyptus camaldulensis</i> subsp. <i>obtusa</i>	C
22432	<i>Eucalyptus chartaboma</i>	C
17252	<i>Eucalyptus crebra</i>	C
17218	<i>Eucalyptus leptophleba</i>	C
17226	<i>Eucalyptus microneura</i>	C
17197	<i>Eucalyptus shirleyi</i>	C
12182	<i>Eucalyptus similis</i>	C
17205	<i>Eucalyptus tetradonta</i>	C
14551	<i>Eucalyptus whitei</i>	C
14441	<i>Leptospermum polygalifolium</i>	C
21825	<i>Lithomyrtus microphylla</i>	C
16730	<i>Lophostemon suaveolens</i>	C
16684	<i>Melaleuca bracteata</i>	C
13427	<i>Melaleuca citrolens</i>	C
18283	<i>Melaleuca fluviatilis</i>	C
16686	<i>Melaleuca foliolosa</i>	C
16689	<i>Melaleuca leucadendra</i>	C
13828	<i>Melaleuca nervosa</i>	C
3272	<i>Melaleuca nervosa</i> subsp. <i>crosslandiana</i>	C
31375	<i>Melaleuca viminalis</i>	C
16657	<i>Melaleuca viridiflora</i>	C
16656	<i>Melaleuca viridiflora</i> var. <i>viridiflora</i>	C
16089	<i>Syzygium eucalyptoides</i> subsp. <i>eucalyptoides</i>	C
13420	<i>Ludwigia octovalvis</i>	C
17774	<i>Buchnera linearis</i>	C
16660	<i>Melhania oblongifolia</i>	C
17127	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	C
11275	<i>Phyllanthus carpentariae</i>	C
6152	<i>Phyllanthus lacerosus</i>	C
30852	<i>Phyllanthus</i> sp. (Alexandra River R.Pullen 8936)	C

41376	<i>Synostemon elachophyllus</i> subsp. <i>elachophyllus</i>	C
36293	<i>Synostemon lissocarpus</i>	C
36296	<i>Synostemon rhytidospermus</i>	C
16503	<i>Petalostigma banksii</i>	C
16505	<i>Petalostigma pubescens</i>	C
9213	<i>Limnophila brownii</i>	C
15670	<i>Alloteropsis semialata</i>	C
27713	<i>Amphipogon sericeus</i>	C
13707	<i>Aristida calycina</i>	C
15649	<i>Aristida calycina</i> var. <i>calycina</i>	C
15652	<i>Aristida holathera</i> var. <i>holathera</i>	C
15653	<i>Aristida hygrometrica</i>	C
15654	<i>Aristida inaequiglumis</i>	C
11129	<i>Aristida ingrata</i>	C
9349	<i>Aristida jerichoensis</i>	C
15655	<i>Aristida jerichoensis</i> var. <i>jerichoensis</i>	C
11518	<i>Aristida latifolia</i>	C
15657	<i>Aristida pruinosa</i>	C
11132	<i>Aristida sciuroides</i>	C
15634	<i>Arundinella nepalensis</i>	C
10316	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	C
15524	<i>Chloris pectinata</i>	C
15531	<i>Chrysopogon fallax</i>	C
15498	<i>Cleistochloa subjuncea</i>	C
15482	<i>Cymbopogon ambiguus</i>	C
15483	<i>Cymbopogon bombycinus</i>	C
15465	<i>Dichanthium fecundum</i>	C
10410	<i>Digitaria ammophila</i>	C
15417	<i>Digitaria bicornis</i>	C
15418	<i>Digitaria breviglumis</i>	C
15419	<i>Digitaria brownii</i>	C
15440	<i>Ectrosia leporina</i>	C
19840	<i>Ectrosia schultzei</i>	C
15397	<i>Elionurus citreus</i>	C
10335	<i>Enneapogon nigricans</i>	C
10331	<i>Enneapogon pallidus</i>	C
15406	<i>Enneapogon polyphyllus</i>	C
10338	<i>Enneapogon robustissimus</i>	C
15389	<i>Eragrostis basedowii</i>	C
15390	<i>Eragrostis brownii</i>	C
10529	<i>Eragrostis eriopoda</i>	C
15374	<i>Eragrostis spartinoides</i>	C
15382	<i>Eriachne ciliata</i>	C
10172	<i>Eriachne melicacea</i>	C
10729	<i>Eriachne mucronata</i>	C
7143	<i>Eriachne mucronata</i> forma (Alpha C.E.Hubbard 7882)	C
15385	<i>Eriachne obtusa</i>	C

10731	<i>Eriachne pallescens</i> var. <i>pallescens</i>	C
7173	<i>Eriachne</i> sp. (Dugald River B.K.Simon+ 3007)	C
10734	<i>Eriachne stipacea</i>	C
10885	<i>Eriachne triodioides</i>	C
15320	<i>Heteropogon contortus</i>	C
15321	<i>Heteropogon triticeus</i>	C
10708	<i>Isachne globosa</i>	C
14437	<i>Leersia hexandra</i>	C
10250	<i>Mnesithea formosa</i>	C
15169	<i>Oxychloris scariosa</i>	C
13607	<i>Panicum effusum</i>	C
14342	<i>Panicum laevinode</i>	C
10655	<i>Panicum robustum</i>	C
10652	<i>Panicum seminudum</i> var. <i>cairnsianum</i>	C
10653	<i>Panicum seminudum</i> var. <i>seminudum</i>	C
15188	<i>Paspalidium rarum</i>	C
13798	<i>Paspalum longifolium</i>	C
15136	<i>Paspalum scrobiculatum</i>	C
15144	<i>Perotis rara</i>	C
15147	<i>Phragmites australis</i>	C
27781	<i>Sarga plumosum</i>	C
15056	<i>Schizachyrium fragile</i>	C
15028	<i>Setaria apiculata</i>	C
10241	<i>Setaria queenslandica</i>	C
15032	<i>Setaria surgens</i>	C
10620	<i>Thaumastochloa brassii</i>	C
10194	<i>Thaumastochloa major</i>	C
15027	<i>Thaumastochloa pubescens</i>	C
14974	<i>Themeda triandra</i>	C
11356	<i>Tragus australianus</i>	C
2149	<i>Triodia bitextura</i>	C
10115	<i>Triodia molesta</i>	C
10118	<i>Triodia pungens</i>	C
29195	<i>Urochloa holosericea</i> subsp. <i>velutina</i>	C
2264	<i>Urochloa praetervisa</i>	C
10574	<i>Yakirra majuscula</i>	C
10628	<i>Yakirra pauciflora</i>	C
17588	<i>Comesperma pallidum</i>	C
34424	<i>Polygala difficilis</i>	C
13131	<i>Polygala exsuarrosa</i>	C
34485	<i>Polygala pycnantha</i>	C
13154	<i>Persicaria barbata</i>	C
8925	<i>Calandrinia arenicola</i>	C
8926	<i>Calandrinia tumida</i>	C
13265	<i>Calandrinia uniflora</i>	C
17027	<i>Grevillea decora</i> subsp. <i>decora</i>	C
17028	<i>Grevillea dryandri</i> subsp. <i>dryandri</i>	C

17031	<i>Grevillea glauca</i>	C
17038	<i>Grevillea mimosoides</i>	C
17039	<i>Grevillea parallela</i>	C
17040	<i>Grevillea pteridifolia</i>	C
17043	<i>Grevillea sessilis</i>	C
17002	<i>Hakea arborescens</i>	C
13215	<i>Hakea chordophylla</i>	C
16498	<i>Persoonia falcata</i>	C
9659	<i>Alphitonia excelsa</i>	C
31103	<i>Alphitonia pomaderroides</i>	C
31347	<i>Cryptandra pogonoloba</i> subsp. <i>pogonoloba</i>	C
15950	<i>Ventilago viminalis</i>	C
13918	<i>Gardenia tessellaris</i>	C
7607	<i>Larsenaikia ochreatea</i>	C
41802	<i>Paranotis mitrasacmoides</i>	C
29824	<i>Psydrax attenuata</i>	C
20023	<i>Synaptantha tillaeacea</i>	C
8213	<i>Synaptantha tillaeacea</i> var. <i>tillaeacea</i>	C
20039	<i>Timonius timon</i>	C
17832	<i>Boronia bowmanii</i>	C
41632	<i>Cyanothamnus warangensis</i>	C
17906	<i>Atalaya hemiglauca</i>	C
33918	<i>Dodonaea barklyana</i>	C
33917	<i>Dodonaea dodecandra</i>	C
17373	<i>Dodonaea filifolia</i>	C
34887	<i>Dodonaea hispidula</i>	C
33919	<i>Dodonaea hispidula</i> var. <i>hispidula</i>	C
13657	<i>Dodonaea oxyptera</i>	C
13658	<i>Dodonaea physocarpa</i>	C
9373	<i>Eremophila acrida</i>	C
5174	<i>Eremophila maculata</i> subsp. <i>maculata</i>	C
29815	<i>Solanum crebrispinum</i>	C
29771	<i>Corchorus sericeus</i> subsp. <i>densiflorus</i>	C
29758	<i>Corchorus sidoides</i> subsp. <i>vermicularis</i>	C
40981	<i>Grewia savannicola</i>	C
16145	<i>Stackhousia intermedia</i>	C
16485	<i>Pimelea decora</i>	C
36112	<i>Pimelea sanguinea</i>	C
12527	<i>Typha domingensis</i>	C
41630	<i>Pigea stellarioides</i>	C
41360	<i>Causonis trifolia</i>	C
15896	<i>Xyris complanata</i>	C
13083	<i>Tribulopsis solandri</i>	C
716	<i>Rhinella marina</i>	
1071	<i>Vulpes vulpes</i>	
1080	<i>Sus scrofa</i>	
19376	<i>Brunoniella</i>	

8825 Rostellularia
14385 Marsdenia
10478 Pterocaulon
13766 Terminalia
11474 Bonamia
16399 Polymeria
17512 Cyperus brevifolius
17113 Fimbristylis
16225 Scleria
17167 Euphorbia
11438 Goodenia
15714 Acacia
10918 Bauhinia variegata
20422 Chamaecrista
14524 Glycine
12968 Indigofera
14196 Senna occidentalis
12878 Stylosanthes
12876 Stylosanthes scabra
13080 Tephrosia
34114 Vachellia farnesiana
13190 Mitrasacme
16963 Hibiscus
22230 Malvastrum americanum
16718 Malvastrum americanum var. americanum
16151 Sida
16195 Sida cordifolia
13430 Melaleuca
16568 Pandanus
12590 Peplidium
16474 Phyllanthus
16183 Scoparia dulcis
14811 Aristida
9642 Bothriochloa
15540 Cenchrus ciliaris
20448 Chrysopogon
15486 Cynodon dactylon
10364 Digitaria
15420 Digitaria ciliaris
14567 Echinochloa colona
10339 Enneapogon
10532 Eragrostis
15387 Eriachne
9154 Melinis repens
10656 Panicum
9198 Thaumastochloa
21699 Urochloa

13138 Polygala
11756 Cheilanthes
14129 Ziziphus mauritiana
16140 Spermacoce
21448 Santalum
14612 Dodonaea
12612 Corchorus
12874 Stylidium

Table B1: Atlas of Living Australia database search results for the search area

Family	Species Name	Common Name	Status ¹
Malvaceae	<i>Abutilon fraseri</i>	ncn	C
Malvaceae	<i>Abutilon otocarpum</i>	Flannel Weed	C
Fabaceae	<i>Acacia cambagei</i>	ncn	C
Fabaceae	<i>Acacia chisholmii</i>	ncn	C
Fabaceae	<i>Acacia colei</i>	ncn	C
Fabaceae	<i>Acacia crombiei</i>	Pink Gidgee	V
Fabaceae	<i>Acacia delicatula</i>	ncn	C
Fabaceae	<i>Acacia dietrichiana</i>	ncn	C
Fabaceae	<i>Acacia elachantha</i>	ncn	C
Fabaceae	<i>Acacia excelsa</i>	Ironwood	C
Fabaceae	<i>Acacia galioides</i>	ncn	C
Fabaceae	<i>Acacia gonoclada</i>	ncn	C
Fabaceae	<i>Acacia hammondii</i>	ncn	C
Fabaceae	<i>Acacia hemignosta</i>	ncn	C
Fabaceae	<i>Acacia holosericea</i>	ncn	C
Fabaceae	<i>Acacia julifera</i>	ncn	C
Fabaceae	<i>Acacia laccata</i>	ncn	C
Fabaceae	<i>Acacia lazaridis</i>	ncn	C
Fabaceae	<i>Acacia leptostachya</i>	ncn	C
Fabaceae	<i>Acacia melleodora</i>	ncn	C
Fabaceae	<i>Acacia phlebocarpa</i>	ncn	C
Fabaceae	<i>Acacia platycarpa</i>	ncn	C
Fabaceae	<i>Acacia stipuligera</i>	ncn	C
Fabaceae	<i>Acacia tenuissima</i>	ncn	C
Fabaceae	<i>Acacia tephрина</i>	ncn	C
Fabaceae	<i>Acacia torulosa</i>	ncn	C
Fabaceae	<i>Acacia tropica</i>	ncn	C
Fabaceae	<i>Acacia victoriae</i>	ncn	C
Amaranthaceae	<i>Achyranthes aspera</i>	Chaff Flower	C
Fabaceae	<i>Adenanthera abrosperma</i>	ncn	C
Asteraceae	<i>Adenostemma lavenia</i>	ncn	C
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash	C
Apocynaceae	<i>Alyxia spicata</i>	ncn	C
Poaceae	<i>Amphipogon sericeus</i>	ncn	C
Loranthaceae	<i>Amyema quandang</i>	ncn	C
Loranthaceae	<i>Amyema villiflora</i>	ncn	C
Fabaceae	<i>Aphyllodium biarticulatum</i>	ncn	C
Poaceae	<i>Aristida hygrometrica</i>	ncn	C

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Family	Species Name	Common Name	Status ¹
Poaceae	<i>Aristida inaequiglumis</i>	ncn	C
Poaceae	<i>Aristida ingrata</i>	ncn	C
Poaceae	<i>Aristida latifolia</i>	Kerosene Grass	C
Poaceae	<i>Aristida lazaridis</i>	ncn	C
Poaceae	<i>Aristida pruinosa</i>	ncn	C
Poaceae	<i>Aristida sciuroides</i>	ncn	C
Fabaceae	<i>Bauhinia cunninghamii</i>	ncn	C
Fabaceae	<i>Bauhinia hookeri</i>	ncn	C
Fabaceae	<i>Bauhinia variegata</i>	ncn	*
Cyperaceae	<i>Baumea rubiginosa</i>	ncn	C
Elatinaceae	<i>Bergia trimera</i>	ncn	C
Blechnaceae	<i>Blechnum orientale</i>	ncn	SL
Convolvulaceae	<i>Bonamia multiflora</i>	ncn	C
Rutaceae	<i>Boronia bowmanii</i>	ncn	C
Rutaceae	<i>Bosistoa medicinalis</i>	Northern Bosistoa	C
Poaceae	<i>Bothriochloa decipiens</i>	Pitted Bluegrass	C
Malvaceae	<i>Brachychiton paradoxus</i>	ncn	SL
Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush	C
Portulacaceae	<i>Calandrinia arenicola</i>	ncn	C
Portulacaceae	<i>Calandrinia uniflora</i>	ncn	C
Myrtaceae	<i>Callistemon viminalis</i>	ncn	C
Myrtaceae	<i>Calytrix exstipulata</i>	ncn	C
Myrtaceae	<i>Calytrix leptophylla</i>	ncn	C
Burseraceae	<i>Canarium australianum</i>	ncn	*
Lauraceae	<i>Cassytha filiformis</i>	Dodder Laurel	C
Fabaceae	<i>Chamaecrista longipes</i>	ncn	C
Fabaceae	<i>Chamaecrista symonii</i>	ncn	C
Poaceae	<i>Chionachne cyathopoda</i>	ncn	C
Poaceae	<i>Chloris gayana</i>	Rhodes Grass	*
Poaceae	<i>Chloris pumilio</i>	ncn	C
Poaceae	<i>Cleistochloa subjuncea</i>	ncn	C
Malvaceae	<i>Corchorus sericeus</i>	ncn	C
Malvaceae	<i>Corchorus sidoides</i>	ncn	C
Asteraceae	<i>Coronidium glutinosum</i>	ncn	C
Myrtaceae	<i>Corymbia confertiflora</i>	ncn	C
Myrtaceae	<i>Corymbia dallachiana</i>	Dallachy's Gum	C
Myrtaceae	<i>Corymbia gilbertensis</i>	ncn	C
Myrtaceae	<i>Corymbia pocillum</i>	ncn	C
Myrtaceae	<i>Corymbia polycarpa</i>	ncn	C
Myrtaceae	<i>Corymbia serendipita</i>	ncn	C

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Family	Species Name	Common Name	Status¹
Myrtaceae	<i>Corymbia terminalis</i>	ncn	C
Myrtaceae	<i>Corymbia trachyphloia</i>	Brown Bloodwood	C
Fabaceae	<i>Crotalaria medicaginea</i>	Tre-foil Rattlepod	C
Fabaceae	<i>Crotalaria novae-hollandiae</i>	New Holland Rattlepod	C
Fabaceae	<i>Crotalaria ramosissima</i>	ncn	C
Rhamnaceae	<i>Cryptandra pogonoloba</i>	ncn	C
Fabaceae	<i>Cullen leucanthum</i>	ncn	C
Cyatheaceae	<i>Cyathea cooperi</i>	Straw Treefern	C
Thelypteridaceae	<i>Cyclosorus interruptus</i>	ncn	C
Cyperaceae	<i>Cyperus cristulatus</i>	ncn	C
Cyperaceae	<i>Cyperus flaccidus</i>	ncn	C
Cyperaceae	<i>Cyperus lucidus</i>	ncn	C
Cyperaceae	<i>Cyperus nervulosus</i>	ncn	C
Poaceae	<i>Dactyloctenium radulans</i>	Button Grass	C
Fabaceae	<i>Daviesia latifolia</i>	ncn	C
Fabaceae	<i>Desmodium filiforme</i>	ncn	C
Poaceae	<i>Dichanthium fecundum</i>	ncn	C
Poaceae	<i>Digitaria gibbosa</i>	ncn	C
Poaceae	<i>Digitaria longiflora</i>	ncn	C
Sapindaceae	<i>Dodonaea dodecandra</i>	ncn	C
Sapindaceae	<i>Dodonaea hispidula</i>	ncn	C
Sapindaceae	<i>Dodonaea oxyptera</i>	ncn	C
Sapindaceae	<i>Dodonaea physocarpa</i>	ncn	C
Sapindaceae	<i>Dodonaea viscosa</i>	ncn	C
Bignoniaceae	<i>Dolichandrone alternifolia</i>	ncn	C
Droseraceae	<i>Drosera burmanni</i>	ncn	C
Rutaceae	<i>Drummondita calida</i>	ncn	V
Poaceae	<i>Ectrosia lasioclada</i>	ncn	C
Poaceae	<i>Ectrosia leporina</i>	ncn	C
Poaceae	<i>Ectrosia schultzei</i>	ncn	C
Cyperaceae	<i>Eleocharis atropurpurea</i>	ncn	C
Cyperaceae	<i>Eleocharis sphacelata</i>	ncn	C
Cyperaceae	<i>Eleocharis tetraquetra</i>	ncn	C
Poaceae	<i>Elionurus citreus</i>	ncn	C
Poaceae	<i>Enneapogon nigricans</i>	ncn	C
Poaceae	<i>Enneapogon pallidus</i>	ncn	C
Poaceae	<i>Enneapogon polyphyllus</i>	Leafy Nine-awn	C
Poaceae	<i>Enneapogon robustissimus</i>	ncn	C
Poaceae	<i>Eragrostis eriopoda</i>	ncn	C
Poaceae	<i>Eragrostis spartinoides</i>	(a) Lovegrass	C

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Family	Species Name	Common Name	Status¹
Scrophulariaceae	<i>Eremophila acrida</i>	ncn	C
Scrophulariaceae	<i>Eremophila maculata</i>	ncn	C
Poaceae	<i>Eriachne ciliata</i>	ncn	C
Poaceae	<i>Eriachne melicacea</i>	ncn	C
Poaceae	<i>Eriachne mucronata</i>	Wanderrie Grass	C
Poaceae	<i>Eriachne sp. Dugald River (B.K.Simon + 3007)</i>	ncn	C
Poaceae	<i>Eriachne triodioides</i>	ncn	C
Eriocaulaceae	<i>Eriocaulon athertonense</i>	ncn	C
Eriocaulaceae	<i>Eriocaulon cinereum</i>	ncn	C
Fabaceae	<i>Erythrophleum chlorostachys</i>	ncn	C
Erythroxylaceae	<i>Erythroxylum ellipticum</i>	ncn	C
Myrtaceae	<i>Eucalyptus approximans</i>	ncn	C
Myrtaceae	<i>Eucalyptus camaldulensis</i>	ncn	C
Myrtaceae	<i>Eucalyptus chartaboma</i>	ncn	C
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Red Ironbark	C
Myrtaceae	<i>Eucalyptus leptophleba</i>	ncn	C
Myrtaceae	<i>Eucalyptus microneura</i>	ncn	C
Myrtaceae	<i>Eucalyptus orgadophila</i>	Mountain Coolabah	C
Myrtaceae	<i>Eucalyptus scoparia</i>	Wallangarra White Gum	V
Myrtaceae	<i>Eucalyptus similis</i>	ncn	C
Myrtaceae	<i>Eucalyptus tetradonta</i>	ncn	C
Myrtaceae	<i>Eucalyptus whitei</i>	ncn	C
Euphorbiaceae	<i>Euphorbia petala</i>	ncn	C
Convolvulaceae	<i>Evolvulus alsinoides</i>	Dwarf Morning Glory	C
Moraceae	<i>Ficus opposita</i>	Deciduous Fig	C
Cyperaceae	<i>Fimbristylis blakei</i>	ncn	C
Cyperaceae	<i>Fimbristylis caespitosa</i>	ncn	C
Cyperaceae	<i>Fimbristylis microcarya</i>	ncn	C
Cyperaceae	<i>Fimbristylis nuda</i>	ncn	C
Phyllanthaceae	<i>Flueggea virosa</i>	ncn	C
Cyperaceae	<i>Fuirena umbellata</i>	ncn	C
Rubiaceae	<i>Gardenia tessellaris</i>	ncn	C
Rutaceae	<i>Geijera salicifolia</i>	Broad-leaved Wilga	C
Goodeniaceae	<i>Goodenia armitiana</i>	ncn	C
Goodeniaceae	<i>Goodenia janamba</i>	ncn	C
Goodeniaceae	<i>Goodenia lamprosperma</i>	ncn	C
Goodeniaceae	<i>Goodenia redacta</i>	ncn	C
Goodeniaceae	<i>Goodenia rosulata</i>	ncn	C
Malvaceae	<i>Gossypium australe</i>	ncn	C

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Malvaceae	<i>Gossypium nelsonii</i>	ncn	C
Proteaceae	<i>Grevillea decora</i>	ncn	C
Proteaceae	<i>Grevillea dryandri</i>	ncn	C
Proteaceae	<i>Grevillea glauca</i>	ncn	C
Proteaceae	<i>Grevillea parallela</i>	Silver Oak	C
Proteaceae	<i>Grevillea sessilis</i>	ncn	C
Malvaceae	<i>Grewia retusifolia</i>	ncn	C
Malvaceae	<i>Grewia savannicola</i>	ncn	C
Haemodoridae	<i>Haemodorum coccineum</i>	ncn	C
Proteaceae	<i>Hakea arborescens</i>	ncn	C
Boraginaceae	<i>Heliotropium cunninghamii</i>	ncn	C
Boraginaceae	<i>Heliotropium tabuliplagae</i>	ncn	C
Boraginaceae	<i>Heliotropium tenuifolium</i>	ncn	C
Salicaceae	<i>Homalium brachybotrys</i>	ncn	C
Fabaceae	<i>Hovea apiculata</i>	ncn	C
Fabaceae	<i>Hovea pedunculata</i>	ncn	C
Araliaceae	<i>Hydrocotyle grammatacarpa</i>	ncn	C
Fabaceae	<i>Indigofera hirsuta</i>	ncn	C
Fabaceae	<i>Indigofera linifolia</i>	ncn	C
Fabaceae	<i>Indigofera linnaei</i>	ncn	C
Poaceae	<i>Iseilema vaginiflorum</i>	Red Flinders Grass	C
Fabaceae	<i>Jacksonia odontoclada</i>	ncn	C
Fabaceae	<i>Jacksonia ramosissima</i>	ncn	C
Juncaceae	<i>Juncus usitatus</i>	Common Rush	C
Fabaceae	<i>Labichea brassii</i>	ncn	NT
Fabaceae	<i>Labichea rupestris</i>	ncn	C
Rutaceae	<i>Leionema ambiens</i>	ncn	NT
Myrtaceae	<i>Leptospermum polygalifolium</i>	Wild May	C
Plantaginaceae	<i>Limnophila brownii</i>	ncn	C
Myrtaceae	<i>Lithomyrtus microphylla</i>	ncn	C
Lycopodiaceae	<i>Lycopodiella cernua</i>	ncn	C
Loranthaceae	<i>Lysiana spathulata</i>	ncn	C
Malvaceae	<i>Malvastrum americanum</i>	ncn	*
Myrtaceae	<i>Melaleuca bracteata</i>	Black Tea Tree	C
Myrtaceae	<i>Melaleuca citrolens</i>	ncn	C
Myrtaceae	<i>Melaleuca fluviatilis</i>	ncn	C
Myrtaceae	<i>Melaleuca foliolosa</i>	ncn	C
Myrtaceae	<i>Melaleuca leucadendra</i>	ncn	C
Myrtaceae	<i>Melaleuca nervosa</i>	ncn	C
Myrtaceae	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	C

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Family	Species Name	Common Name	Status¹
Malvaceae	<i>Melhania oblongifolia</i>	Melhania	C
Lamiaceae	<i>Mesosphaerum suaveolens</i>	ncn	*
Fabaceae	<i>Mirbelia viminalis</i>	ncn	C
Loganiaceae	<i>Mitrasacme connata</i>	ncn	C
Poaceae	<i>Mnesithea formosa</i>	ncn	C
Scrophulariaceae	<i>Myoporum montanum</i>	ncn	C
Acanthaceae	<i>Nelsonia campestris</i>	ncn	C
Oleaceae	<i>Notelaea linearis</i>	ncn	C
Olacaceae	<i>Olax stricta</i>	ncn	C
Rubiaceae	<i>Oldenlandia galioides</i>	ncn	C
Rubiaceae	<i>Oldenlandia mitrasacmoides</i>	ncn	*
Asteraceae	<i>Olearia xerophila</i>	ncn	C
Poaceae	<i>Panicum laevinode</i>	ncn	C
Poaceae	<i>Panicum seminudum</i>	ncn	C
Poaceae	<i>Panicum trachyrhachis</i>	ncn	C
Poaceae	<i>Paspalum scrobiculatum</i>	Scrobic	C
Rubiaceae	<i>Pavetta australiensis</i>	Pavetta	C
Poaceae	<i>Perotis rara</i>	ncn	C
Polygonaceae	<i>Persicaria barbata</i>	ncn	C
Proteaceae	<i>Persoonia falcata</i>	Wild Pear	C
Picrodendraceae	<i>Petalostigma banksii</i>	ncn	C
Picrodendraceae	<i>Petalostigma pubescens</i>	Quinine Bush	C
Phyllanthaceae	<i>Phyllanthus lacerosus</i>	ncn	C
Phyllanthaceae	<i>Phyllanthus sp. Alexandra River (R.Pullen 8936)</i>	ncn	C
Thymelaeaceae	<i>Pimelea decora</i>	ncn	C
Thymelaeaceae	<i>Pimelea sanguinea</i>	ncn	C
Pittosporaceae	<i>Pittosporum undulatum</i>	Sweet Pittosporum	C
Sapotaceae	<i>Planchonella obovata</i>	ncn	C
Pteridaceae	<i>Platyzoma microphyllum</i>	ncn	SL
Asparagaceae	<i>Pleomele angustifolia</i>	ncn	C
Polygalaceae	<i>Polygala difficilis</i>	ncn	C
Polygalaceae	<i>Polygala exsuarrosa</i>	ncn	C
Convolvulaceae	<i>Polymeria lanata</i>	ncn	C
Potamogetonaceae	<i>Potamogeton crispus</i>	ncn	C
Pteridaceae	<i>Pteris platyzomopsis</i>	ncn	C
Asteraceae	<i>Pterocaulon sphacelatum</i>	Fruit-salad Plant	C
Chenopodiaceae	<i>Salsola australis</i>	Soft Roly Poly	C
Poaceae	<i>Schizachyrium fragile</i>	ncn	C
Cyperaceae	<i>Schoenoplectiella lateriflora</i>	ncn	*

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Cyperaceae	<i>Schoenus kennyi</i>	ncn	C
Fabaceae	<i>Senna artemisioides</i>	ncn	C
Fabaceae	<i>Senna costata</i>	ncn	C
Malvaceae	<i>Seringia adenolasia</i>	ncn	C
Malvaceae	<i>Seringia collina</i>	ncn	C
Sapotaceae	<i>Sersalisia sericea</i>	ncn	C
Poaceae	<i>Setaria apiculata</i>	ncn	C
Poaceae	<i>Setaria queenslandica</i>	ncn	C
Malvaceae	<i>Sida cordifolia</i>	Flannel Weed	*
Malvaceae	<i>Sida hackettiana</i>	Shrub Sida	C
Malvaceae	<i>Sida rohlenae</i>	ncn	C
Malvaceae	<i>Sida sp. Gordonbrook Station (E.J.Thompson + MUT46)</i>	ncn	C
Solanaceae	<i>Solanum crebrispinum</i>	ncn	C
Stylidiaceae	<i>Stylidium eriorhizum</i>	ncn	SL
Stylidiaceae	<i>Stylidium rotundifolium</i>	ncn	SL
Fabaceae	<i>Stylosanthes scabra</i>	ncn	C
Surianaceae	<i>Suriana maritima</i>	ncn	C
Rubiaceae	<i>Synaptantha tillaeacea</i>	ncn	C
Phyllanthaceae	<i>Synostemon elachophyllus</i>	ncn	C
Phyllanthaceae	<i>Synostemon lissocarpus</i>	ncn	C
Phyllanthaceae	<i>Synostemon rhytidospermus</i>	ncn	C
Myrtaceae	<i>Syzygium branderhorstii</i>	ncn	C
Myrtaceae	<i>Syzygium eucalyptoides</i>	ncn	C
Fabaceae	<i>Tephrosia leptoclada</i>	ncn	C
Fabaceae	<i>Tephrosia sp. Magazine Hill (P.Jones 365)</i>	ncn	C
Combretaceae	<i>Terminalia aridicola</i>	ncn	C
Poaceae	<i>Thaumastochloa major</i>	ncn	C
Poaceae	<i>Thaumastochloa pubescens</i>	ncn	C
Poaceae	<i>Thaumastochloa rubra</i>	ncn	C
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass	C
Poaceae	<i>Triodia molesta</i>	ncn	C
Poaceae	<i>Triodia pungens</i>	ncn	C
Poaceae	<i>Urochloa holosericea</i>	ncn	C
Phrymaceae	<i>Uvedalia linearis</i>	ncn	C
Fabaceae	<i>Vachellia bidwillii</i>	ncn	C
Fabaceae	<i>Vachellia farnesiana</i>	Prickly Acacia	*
Fabaceae	<i>Vachellia sutherlandii</i>	ncn	C
Verbenaceae	<i>Verbena officinalis</i>	ncn	*
Campanulaceae	<i>Wahlenbergia tumidifructa</i>	ncn	SL

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Family	Species Name	Common Name	Status ¹
Malvaceae	<i>Waltheria indica</i>	ncn	C
Asteraceae	<i>Xanthium occidentale</i>	Noogera Burr	*
Xyridaceae	<i>Xyris complanata</i>	ncn	C
Poaceae	<i>Yakirra majuscula</i>	ncn	C
Rhamnaceae	<i>Ziziphus mauritiana</i>	Chinee Apple	*(RI)
Fabaceae	<i>Zornia adenophora</i>	ncn	C
Fabaceae	<i>Zornia prostrata</i>	ncn	C

¹Status:

NC Act – CR, Critically endangered; E, Endangered; V, Vulnerable; NT, Near threatened; LC, Least concern; SL (M), Special least concern.

Biosecurity Act – RI, Resitricted invasive

* Exotic species

Table B2: Australasian Virtual Herbarium database search results for the search area

Class	Species Name	Vernacular Name	NC Act Status ¹
Aves	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	LC
Aves	<i>Accipiter (Leucospiza) fasciatus</i>	Brown Goshawk	LC
Aves	<i>Accipiter (Paraspizias) cirrocephalus</i>	Collared Sparrowhawk	LC
Aves	<i>Anas (Anas) superciliosa</i>	Grey duck	LC
Aves	<i>Anas (Nettion) gracilis</i>	Grey teal	LC
Aves	<i>Anhinga novaehollandiae</i>	Australasian Darter	LC
Aves	<i>Aprosmictus erythropterus</i>	Red-winged Parrot	LC
Aves	<i>Aquila (Uroaetus) audax</i>	Wedge-tailed Eagle	LC
Aves	<i>Ardea (Casmerodius) modesta</i>	Eastern Great Egret	LC
Aves	<i>Ardea (Mesophoyx) intermedia</i>	Intermediate Egret	LC
Aves	<i>Ardeotis australis</i>	Wild Turkey	LC
Aves	<i>Artamus (Angroyan) cinereus</i>	Black-faced Woodswallow	LC
Aves	<i>Artamus (Angroyan) cinereus melanops</i>	Black-faced Woodswallow	LC
Aves	<i>Artamus (Angroyan) minor</i>	Little Woodswallow	LC
Aves	<i>Artamus (Artamus) leucorhynchus</i>	White-breasted Woodswallow	LC
Aves	<i>Artamus (Campbellornis) personatus</i>	Masked Woodswallow	LC
Aves	<i>Artamus (Campbellornis) superciliosus</i>	White-browed woodswallow	LC
Aves	<i>Aviceda (Aviceda) subcristata</i>	Pacific Baza	LC
Aves	<i>Aythya (Nyroca) australis</i>	Hardhead	LC
Aves	<i>Burhinus (Burhinus) grallarius</i>	Bush Stone-curlew	LC
Aves	<i>Cacatua (Cacatua) galerita</i>	Sulphur-crested Cockatoo	LC
Aves	<i>Calyptorhynchus (Calyptorhynchus) banksii</i>	Red-tailed Black Cockatoo	LC
Aves	<i>Centropus (Polophilus) phasianinus</i>	Pheasant Coucal	LC
Aves	<i>Chenonetta jubata</i>	Maned Duck	LC
Aves	<i>Cincloramphus (Maclellannia) mathewsi</i>	Rufous Songlark	LC
Aves	<i>Climacteris (Climacteris) picumnus</i>	Brown Treecreeper	LC
Aves	<i>Climacteris (Climacteris) picumnus picumnus</i>	Brown Treecreeper	LC
Aves	<i>Colluricincla (Colluricincla) harmonica</i>	Grey Shrike-thrush	LC
Aves	<i>Colluricincla (Colluricincla) harmonica superciliosa</i>	Grey Shrike-thrush	LC
Aves	<i>Coracina (Coracina) novaehollandiae</i>	Black-faced cuckoo-shrike	LC
Aves	<i>Coracina (Coracina) papuensis</i>	White-bellied Cuckoo-shrike	LC
Aves	<i>Coracina (Pteropodocys) maxima</i>	Ground Cuckoo-shrike	LC
Aves	<i>Corvus coronoides</i>	Australian Raven	LC

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Class	Species Name	Vernacular Name	NC Act Status¹
Aves	<i>Corvus orru</i>	Torresian Crow	LC
Aves	<i>Cracticus nigrogularis</i>	Pied Butcherbird	LC
Aves	<i>Cracticus torquatus</i>	Grey Butcherbird	LC
Aves	<i>Dacelo (Dacelo) leachii</i>	Blue-winged Kookaburra	LC
Aves	<i>Dacelo (Dacelo) novaeguineae</i>	Kookaburra	LC
Aves	<i>Daphoenositta (Neositta) chrysoptera striata</i>	Varied Sittella	LC
Aves	<i>Dendrocygna (Dendrocygna) arcuata australis</i>	Wandering Whistling Duck	LC
Aves	<i>Dendrocygna (Leptotarsis) eytoni</i>	Grey Whistler	LC
Aves	<i>Dicaeum (Dicaeum) hirundinaceum</i>	Mistletoebird	LC
Aves	<i>Dromaius novaehollandiae</i>	Emu	LC
Aves	<i>Egretta novaehollandiae</i>	White-faced Heron	LC
Aves	<i>Elseya melanops</i>	Black-fronted Dotterel	LC
Aves	<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	LC
Aves	<i>Eolophus roseicapilla</i>	Galah	LC
Aves	<i>Erythronyx cinctus</i>	Red-kneed Dotterel	LC
Aves	<i>Falco (Falco) longipennis</i>	Australian Hobby	LC
Aves	<i>Fulica atra</i>	Eurasian Coot	LC
Aves	<i>Gavicalis virescens</i>	Singing Honeyeater	LC
Aves	<i>Geopelia cuneata</i>	Diamond Dove	LC
Aves	<i>Geopelia striata</i>	Peaceful Dove	LC
Aves	<i>Geophaps (Geophaps) scripta</i>	Squatter Pigeon	V
Aves	<i>Gerygone fusca</i>	Western Gerygone	LC
Aves	<i>Gerygone olivacea olivacea</i>	White-throated Gerygone	LC
Aves	<i>Grallina cyanoleuca</i>	Magpie-lark	LC
Aves	<i>Grus (Mathewsia) rubicunda</i>	Brolga	LC
Aves	<i>Gymnorhina tibicen</i>	Australian Magpie	LC
Aves	<i>Haliastur sphenurus</i>	Whistling Kite	LC
Aves	<i>Lalage (Lalage) sueurii</i>	White-winged Triller	LC
Aves	<i>Lichmera (Lichmera) indistincta</i>	Brown Honeyeater	LC
Aves	<i>Malacorhynchus membranaceus</i>	Pink-eared Duck	LC
Aves	<i>Malurus (Leggeornis) lamberti</i>	Variegated Fairy-wren	LC
Aves	<i>Manorina (Myzantha) flavigula</i>	Yellow-throated Miner	LC
Aves	<i>Melanodryas (Melanodryas) cucullata</i>	Hooded Robin	LC
Aves	<i>Melithreptus (Eidopsarus) gularis</i>	Black-chinned Honeyeater	LC
Aves	<i>Melopsittacus undulatus</i>	Budgerigar	LC
Aves	<i>Merops (Merops) ornatus</i>	Rainbow Bee-eater	LC
Aves	<i>Microcarbo melanoleucos</i>	Little Pied Cormorant	LC
Aves	<i>Microeca (Microeca) fascinans</i>	Jacky Winter	LC

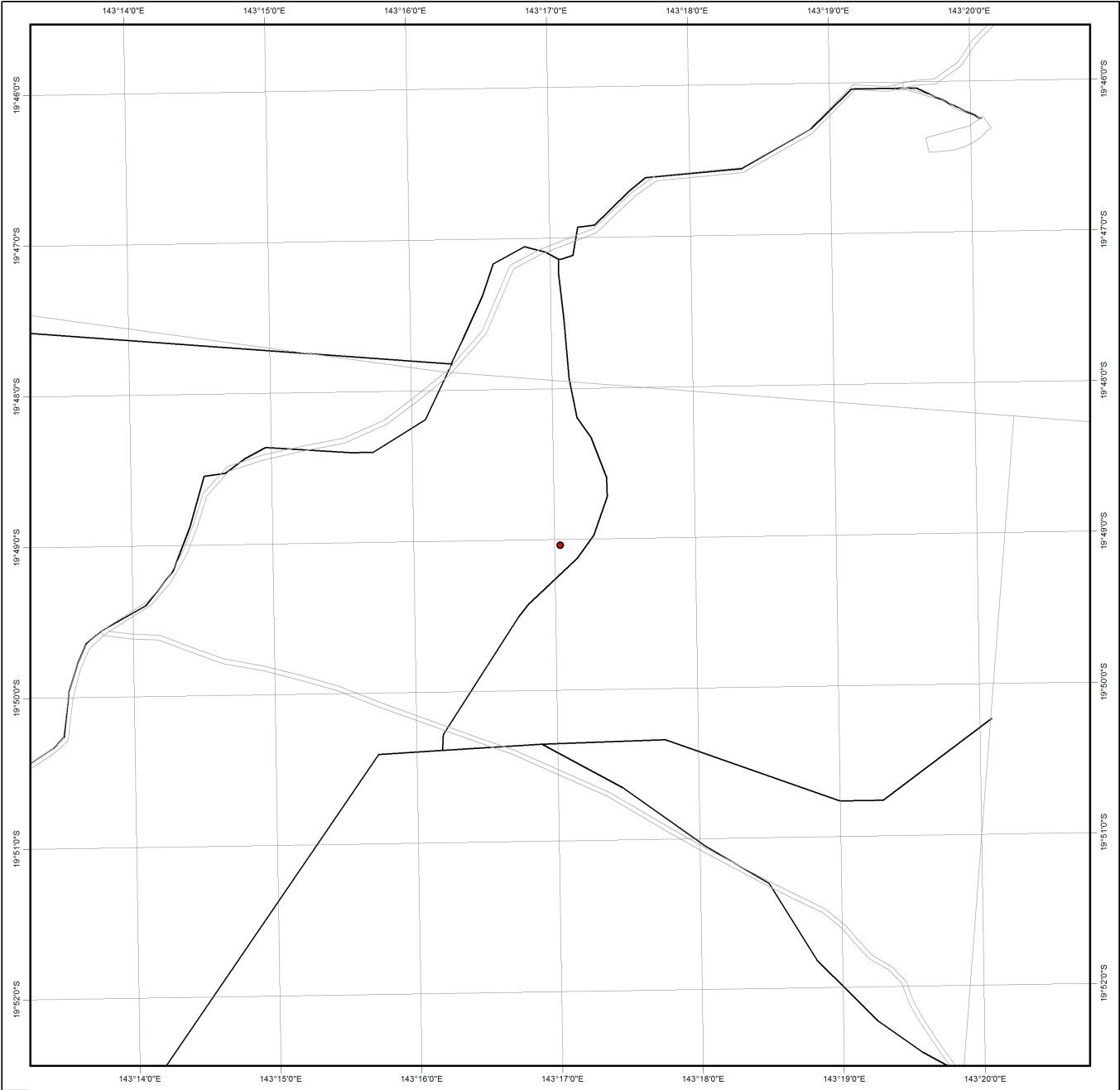
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Class	Species Name	Vernacular Name	NC Act Status ¹
Aves	<i>Microeca (Microeca) fascians pallida</i>	Jacky Winter	LC
Aves	<i>Milvus migrans</i>	Black Kite	LC
Aves	<i>Myiagra (Seisura) inquieta</i>	Restless Flycatcher	LC
Aves	<i>Nettapus (Cheniscus) pulchellus</i>	Green Pygmy-goose	LC
Aves	<i>Ninox (Ninox) novaeseelandiae</i>	Southern Boobook	LC
Aves	<i>Ocyphaps lophotes</i>	Crested Pigeon	LC
Aves	<i>Oreoica gutturalis</i>	Crested Bellbird	LC
Aves	<i>Oreoica gutturalis gutturalis</i>	Crested Bellbird	LC
Aves	<i>Oriolus (Mimeta) sagittatus</i>	Olive-backed Oriole	LC
Aves	<i>Pachycephala (Alisterornis) rufiventris</i>	Rufous Whistler	LC
Aves	<i>Pardalotus (Pardalotinus) rubricatus</i>	Red-browed Pardalote	LC
Aves	<i>Pardalotus (Pardalotinus) striatus</i>	Striated Pardalote	LC
Aves	<i>Petrochelidon (Petrochelidon) ariel</i>	Fairy Martin	LC
Aves	<i>Phalacrocorax (Phalacrocorax) sulcirostris</i>	Little Black Cormorant	LC
Aves	<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	LC
Aves	<i>Philemon (Microphilemon) citreogularis</i>	Little Friarbird	LC
Aves	<i>Philemon (Tropidorhynchus) corniculatus</i>	Noisy Friarbird	LC
Aves	<i>Platalea (Platalea) regia</i>	Royal Spoonbill	LC
Aves	<i>Platycercus (Violania) adscitus</i>	Pale-headed Rosella	LC
Aves	<i>Plegadis falcinellus</i>	Glossy Ibis	SL (M)
Aves	<i>Poephila (Poephila) cincta</i>	Black-throated Finch	LC
Aves	<i>Pomatostomus (Pomatostomus) temporalis</i>	Grey-crowned Babbler	LC
Aves	<i>Psittenteles versicolor</i>	Varied Lorikeet	LC
Aves	<i>Ptilonorhynchus nuchalis</i>	Great Bowerbird	LC
Aves	<i>Ptilotula flavescens</i>	Yellow-tinted Honeyeater	LC
Aves	<i>Ptilotula plumula</i>	Grey-fronted Honeyeater	LC
Aves	<i>Rhipidura (Rhipidura) albiscapa</i>	Grey Fantail	LC
Aves	<i>Rhipidura (Sauloprocta) leucophrys</i>	Willie Wagtail	LC
Aves	<i>Smicromis brevirostris</i>	Weebill	LC
Aves	<i>Stizoptera bichenovii</i>	Double-barred Finch	LC
Aves	<i>Strepera (Strepera) graculina</i>	Pied Currawong	LC
Aves	<i>Struthidea cinerea</i>	Apostlebird	LC
Aves	<i>Tachybaptus novaehollandiae</i>	Australasian Little Grebe	LC
Aves	<i>Taeniopygia guttata</i>	Zebra Finch	LC
Aves	<i>Threskiornis spinicollis</i>	Straw-necked Ibis	LC
Aves	<i>Todiramphus (Cyanalcyon) pyrrhopygius</i>	Red-backed Kingfisher	LC

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Class	Species Name	Vernacular Name	NC Act Status¹
Aves	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	LC
Aves	<i>Vanellus (Lobipluvia) miles</i>	Masked Lapwing	LC
Aves	<i>Vanellus (Lobivanellus) tricolor</i>	Banded Lapwing	LC
Mammalia	<i>Chaerephon jobensis</i>	Northern Mastiff Bat	LC
Mammalia	<i>Planigale tenuirostris</i>	Narrow-nosed Planigale	LC
Reptilia	<i>Demansia torquata</i>	Collared Whipsnake	LC
Reptilia	<i>Denisonia devisi</i>	De Vis' Banded Snake	LC
Reptilia	<i>Tympanocryptis intima</i>	Gibber Earless Dragon	LC
Reptilia	<i>Varanus gouldii</i>	Gould's Goanna	LC

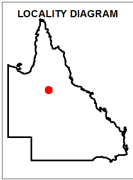
¹NC Act Status – CR, Critically endangered; E, Endangered; V, Vulnerable; NT, Near threatened; LC, Least concern; SL (M), Special least concern (migratory).



Protected Plants Flora Survey Trigger Map

Legend

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



This product is projected into:
GDA 1994 Queensland Albers

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

Land parcel boundaries are provided as locational aid only.

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

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

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

Protected plants flora survey trigger map

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

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

Updates to the data informing the flora survey trigger map

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

Species information

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

Appendix C

Detailed desktop assessment

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C1 Overview of environmental values

C1.1 Geology

The surface geology of the project site comprises five geological units. The southern portion of the project site is characterised by sandy, gravelly colluvium associated with the Hampstead Sandstone and Gilbert River Formations. The predominant geology in northern portion of the project site is unconsolidated sediments of the Wondoola Beds associated with the Woolgar River and its major tributaries. Bands of metamorphic and arenite rock in the north-eastern and central-western portions of the project site (NRM 2011).

Equivalent Land Zones (as defined under the VM Act and in Wilson and Taylor, 2012) are also listed in Table C1.

Table C1: Geology mapping within the project site

Map symbol	Geological unit	Lithology	Dominant rock type	Equivalent land zone
Jh	Hampstead Sandstone	Clayey, commonly pebbly, quartzose sandstone and conglomerate	Arenite	10
PLs	PLs-Gt	Probably biotite gneiss, amphibolite and migmatite with extensive areas of S-type granitoids; mostly not exposed except in deep gorges such as the Woolgar, Stawell and Dutton River	Metamorphic	11
PLe/Wm	Einasleigh Metamorphics	Probable biotite gneiss, migmatite, calc-silicate gneiss and amphibolite (including mafic granulite); mostly not exposed except along the Woolgar River	Metamorphic	11
TQw	Wondoola beds	Red and grey clay, silt and sand	Miscellaneous unconsolidated sediments	3
TQr\q>jh	Hampstead Sandstone	Quartzose sand and gravel, largely residual	Colluvium	10
TQr\q>jkg	Gilbert River Formation	Quartzose sand and gravel, largely residual	Colluvium	10

C1.2 Soils

The southern portion of the project site is mapped as supporting coarse, earthy sands with weak pedologic organisation on gently undulating plains. Uniform earthy loams on strongly undulating lands with short steep slopes are mapped throughout the north-western portion of the project site. Uniform, coarse pale sand on low hilly or hilly dissected sandstone plateaux often with narrow steep sided gorges & ravines are mapped in the north-eastern extent of the project site (Bureau of Rural Sciences 2009).

C1.3 Surface water

The Woolgar River, which is mapped as a major watercourse (stream order 6) extends along a portion of the central-western boundary of the project site (Figure 6). A number of 1st and 2nd order drainage lines originate from the portion of the Gregory Range that extends into the eastern portion of the project site. A number of these drainage lines flow in a north-westerly direction and discharge into the Woolgar River between 100 to 600 m west of the project site boundary. A number of these drainage lines also flow in a westerly and north-westerly direction into an unnamed tributary (stream order 3 and 4) of the Woolgar River, the confluence of which is approximately 100 m downstream from the central-western boundary of the project site. Two farm dams are located in the central-western and south-western portions of the project site that provide permanent sources of water (Figure 6).

C1.4 Protected Areas

The project site is not located within or adjacent to any protected areas such as National Parks, Conservation Reserves, State Forests and/or Timber, Forest or Resource Reserves. The nearest protected area is approximately 35 km north-north-east of the project site.

C2 Queensland Government mapping

C2.1 Remnant vegetation

Desktop searches of REs mapped by the Queensland Government were conducted to inform the design of the field work program. The flora surveys culminated in ground truthed vegetation mapping which was submitted to the Queensland Herbarium for validation. The Herbarium validated vegetation map (Figure 6) was used as the basis for this MSES assessment. The Herbarium's validation confirmed that the entire project site is mapped as supporting remnant vegetation containing 14 least concern RE types. Table C2 provides a list and short description of the Herbarium validated REs mapped by the Queensland Government within the project site.

Table C2: Herbarium validated Queensland Government mapped remnant REs within the project site

RE code	Short description	Status		Other
		VM Act	Biodiversity	
2.3.21j	<i>Eucalyptus leptophleba</i> and/or <i>Corymbia polycarpa</i> and/or <i>C. confertiflora</i> woodland to open woodland on levees and active Quaternary alluvial plains of upper tributary watercourses in the east of the bioregion.	Least Concern	Of Concern	Not a Wetland
2.3.26b	<i>Eucalyptus camaldulensis</i> woodland, commonly with <i>Melaleuca fluviatilis</i> . Occurs on fringes of major watercourses in the south-east of the bioregion on alluvial sands and loams.	Least concern	Of concern	Riverine
2.3.40	<i>Eucalyptus microtheca</i> and/or <i>E. microneura</i> and/or <i>Lysiphyllum spp.</i> open woodland on active Quaternary alluvial plains.	Least concern	Of concern	Not a wetland.
2.3.41	<i>Aristida dominii</i> , <i>Eriachne spp.</i> , <i>Chloris lobata</i> +/- <i>Eragrostis basedowii</i> , <i>Iseilema sp.</i> tussock grassland on active Quaternary alluvial plains of major watercourses.	Least concern	Of concern	Not a wetland.
2.3.50a	Bare sand and rock with scattered shrubs and patches of grasses, forbs and sedges. Occurs in the channels of major watercourses.	Least concern	Of concern	Riverine
2.5.9	<i>Eucalyptus microneura</i> woodland with a grassy understorey of <i>Aristida spp.</i> Occurs on plains and plateaus on earths, podsols and skeletal soils. (BVG1M: 18d)	Least Concern	No concern at present	Not a Wetland
2.5.18a	<i>Corymbia setosa</i> low open woodland to woodland, commonly with <i>Erythrophleum chlorostachys</i> . Occurs on broad, gently undulating, Tertiary sand sheets in the south-east of the bioregion. Brown sands and sandy loams.	Least Concern	No concern at present	Not a Wetland
2.5.20	<i>Eucalyptus similis</i> and/or <i>E. chartaboma</i> +/- <i>Erythrophleum chlorostachys</i> , <i>Corymbia spp.</i> woodland on undulating Tertiary sand sheets, moderately high in the landscape.	Least concern	No concern at present	Not a wetland.

RE code	Short description	Status		Other
		VM Act	Biodiversity	
2.7.2a	<i>Eucalyptus microneura</i> low open woodland to low woodland. Occurs on low rises and outcrops of ferricrete.	Least concern	No concern at present	Not a wetland.
2.10.1a	<i>Eucalyptus microneura</i> low open woodland to low woodland on plains and low rises of Mesozoic sandstone, commonly exposed by erosion of Tertiary outwash plains.	Least Concern	No concern at present	Not a Wetland
2.10.2x5a	<i>Corymbia serendipita</i> woodland, commonly with a lower tree layer of <i>Acacia shirleyi</i> . Occurs on slopes, gullies and stepped scarps in Mesozoic sandstone ranges. (BVG1M: 24a)	Least Concern	No concern at present	Not a Wetland
2.10.4	<i>Eucalyptus microneura</i> or <i>E. provecta</i> +/- <i>Corymbia pocillum</i> open woodland on sandstone ranges.	Least concern	No concern at present	Not a wetland
2.10.13	<i>Eucalyptus crebra</i> or <i>E. whitei</i> low open woodland on slopes of sandstone ranges.	Least concern	No concern at present	Not a wetland
2.11.1c	<i>Eucalyptus provecta</i> low woodland, occasionally with <i>Corymbia pocillum</i> , <i>C. dallachiana</i> and <i>Eucalyptus microneura</i> . Occurs on steep Metamorphic footslopes. Skeletal, pale, sandy to pebbly soil.	Least Concern	No concern at present	Not a Wetland

¹ Short description, VM Act and Biodiversity status defined under the Regional Ecosystem Description Database (REDD) (Queensland Herbarium 2021).

C2.1.1 Vegetation management watercourses

All watercourses and drainage lines within the project site are identified as vegetation management watercourses that intersect with mapped remnant vegetation (Figure 7).

C2.1.2 Vegetation management wetlands

There are no vegetation management wetlands mapped within or adjacent to the project site.

C2.2 Regrowth vegetation

There is no regrowth vegetation mapped by the Queensland Government in the project site.

C2.3 Referable wetlands and springs

The search of the referable wetlands map shows there are no WPAs or HEV waters within or adjacent to the project site. Similarly there are no HES wetlands within the project site. The Woolgar River and associated riparian corridor is identified supporting GES wetlands. GES wetlands are mapped for the purpose of establishing environmental values and are not protected wetlands or MSSES (DES 2022).

A number of springs have been identified by the Queensland Government in the broader area, particularly within the Gregory range to the east and north. None of these springs are located within the project site. The closest active spring is located approximately 900 m to the east of the northern extent of the project site.

C3 Significant flora species

C3.1 Vulnerable flora

Database searches identified four vulnerable flora species listed under the NC Act as either being recorded or potentially occurring within search area (Table C3).

Table C3: Significant flora species returned from database searches

Common name/Species name	NC Act status ¹	Source ²
<i>Cycas platyphylla</i> (no common name)	V	PMST
<i>Drummondita calida</i> (no common name)	V	WN, AVH
Pink Gidgee (<i>Acacia crombiei</i>)	V	PMST, WN, AVH
Wallangarra White Gum (<i>Eucalyptus scoparia</i>)	V	AVH

Grey shading indicates residual MSES species being considered in this report.

¹NC Act Status – V, Vulnerable

²Source:

- AVH – Australasian Virtual Herbarium (Table B2 of Appendix B)
- PMST – Protected Matters Search Tool (PMST database results contained in Appendix B)
- WN – WildNet Online database (WildNet database search results contained in Appendix B).

It should be noted that the EBPC Act PMST identifies significant species based on a combination of actual records and/or predictive modelling and does not necessarily indicate that a species has actually been recorded from the search area.

Of the species listed in Table C3, three are also listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), namely Pink Gidgee, *Cycas platyphylla* and Wallangarra White Gum. As explained in Sections 1 and 2.5 of this report, a separate assessment of Commonwealth matters of national environmental significance (MNES) listed under the EPBC Act has been undertaken for this project (Eco Solutions & Management 2022). The separate MNES assessment considered these species and therefore, *Drummondita calida*, is the only residual MSES species addressed as part of this current assessment.

These four species identified in database searches, along with a description of their preferred habitat, and likelihood of occurrence within the project site, are included in Appendix D.

C3.2 Near threatened flora

Four flora species listed as near threatened under the NC act were returned from database searches, namely Forest Phebalium (*Leionema ambiens*), *Eucalyptus approximans* (no common name), *Labichera brassii* (no common name) and *Leptospermum pallidum* (no common name). None of these species are listed under the EPBC Act.

A description of the preferred habitat of these species and an assessment of the likelihood of occurrence within the project site is outlined in Appendix D.

C3.3 Protected plants high risk areas

No high-risk areas (HRAs) are mapped within the project site on the Queensland Protected Plants Flora Survey Trigger Map (Appendix B). There are no areas mapped by the Queensland Government as essential habitat for threatened flora within the project site.

C4 Significant fauna

C4.1 Threatened fauna

Database searches identified a total of 17 threatened fauna species listed under the NC Act as either being recorded or having the potential to occur within the search area (Table C4).

Table C4: Significant fauna species returned from database searches

Common name/Species name	NC Act status ¹	Source ²
Birds		
Curlew Sandpiper (<i>Calidris ferruginea</i>)	CR	PMST
Australian Painted Snipe (<i>Rostratula australis</i>)	E	PMST
Black-throated Finch (Southern) (<i>Poephila cincta cincta</i>)	E	WN
Gouldian Finch (<i>Erythrura gouldiae</i>)	E	PMST
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	E	PMST
Star Finch (<i>Neochmia ruficauda ruficauda</i>)	E	PMST
Grey Falcon (<i>Falco hypoleucos</i>)	V	PMST
Masked Owl (Northern) (<i>Tyto novaehollandiae kimberli</i>)	V	PMST
Painted Honeyeater (<i>Grantiella picta</i>)	V	PMST
Squatter Pigeon (Southern) (<i>Geophaps scripta scripta</i>)	V	WN, ALA
Mammals		
Ghost Bat (<i>Macroderma gigas</i>)	E	PMST
Julia Creek Dunnart (<i>Sminthopsis douglasi</i>)	E	PMST
Large-eared Horseshoe Bat (<i>Rhinolophus robertsi</i>)	E	PMST
Greater Glider (<i>Petauroides volans</i>)	V	PMST
Koala (<i>Phascolarctos cinereus</i>)	V	PMST, WN
Reptiles		
Plains Death Adder (<i>Acanthophis hawkei</i>)	V	PMST
Yakka Skink (<i>Egernia rugosa</i>)	V	PMST

¹NC Act Status – CR, Critically endangered; E, Endangered, V, Vulnerable; NT, Near threatened;

²Source:

- ALA – Atlas of Living Australia (Table B1 of Appendix B)
- PMST – Protected Matters Search Tool (PMST database results contained in Appendix B)
- WN – WildNet database (WildNet database search results contained in Appendix B).

It should be noted that the EBPC Act PMST identifies significant species based on a combination of actual records and/or predictive modelling and does not necessarily indicate that a species has actually been recorded from the search area.

All of the fauna species listed in Table C4 are also listed as threatened under the EPBC Act and have therefore been addressed in the separate MNES assessment report (Eco Solutions & Management 2022). These species along with a description of their preferred habitat, and likelihood of occurrence within the project site are outlined in Appendix D. No residual threatened fauna listed under the NC Act occur or are considered likely to occur in the project site, therefore threatened fauna have not been addressed further in this MSES report.

C4.2 Near threatened fauna

No records for fauna species listed as near threatened under the NC Act were returned from the database searches.

C4.3 Special least concern fauna

One special least concern species, the Short-beaked Echidna (*Tachyglossus aculeatus*), was identified from the database searches (Appendix B) as occurring in the search area.

In addition, 12 special least concern migratory birds were also identified in database search results as occurring or potentially occurring in the search area (Appendix B). Marine/oceanic species (i.e. whales, turtles, oceanic birds etc.) were not considered as part of this assessment, given the project site is located more than 400 km inland from the coast and does not support any marine or intertidal habitats. Special least concern migratory species are not listed as MSES under the EO Act and therefore, have not been considered further in this assessment.

C4.4 Essential habitat

There are no areas mapped by the Queensland Government as essential habitat for threatened fauna species within the project site (DR 2021).

C4.5 Koala habitat areas

The Queensland Government has produced mapping of Koala Districts, priority areas and habitat areas as required under Division 3, Section 8 of the *Nature Conservation (Koala) Conservation Plan 2017* (Koala Conservation Plan). The Koala Conservation Plan maps focus efforts for habitat protection, restoration and threat mitigation towards areas with the highest likelihood of achieving the best conservation outcomes for koalas.

The project site is not located within a mapped Koala District and there are no Koala habitat areas mapped within or adjacent to the project site. It is noted that at present, Koala habitat areas have only been identified by the Queensland Government within Koala District A.

C4.6 Critical habitat

The project site is not within an area identified as Critical Habitat under the NC Act.

C5 Biodiversity Planning Assessment Mapping

The DES has prepared a Biodiversity Planning Assessment for the region. The Queensland Government mapped remnant vegetation associated with the Woolgar River corridor is identified as supporting state significant biodiversity values. The majority of remaining remnant areas in the project site have been identified as having local biodiversity value, with regional values mapped across the south-western slopes and plains of the portion of the Gregory Range that extends into the project site (Figure 5).

Additionally, the Woolgar River has been identified as a state significant, riparian corridor. This mapped corridor extends into the central-western and northern extent of the project site (Figure 5).

C6 Previous studies in the region

No other large-scale projects involving flora and fauna surveys have been undertaken within a 50 km radius of the project site.

Appendix D

Likelihood for significant flora and
fauna to occur in the project site

Table D1: Assessment of likelihood for threatened and near threatened flora species returned from database searches to occur in the project site

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
<i>Cycas platyphylla</i> (no common name)	Vulnerable	Vulnerable	PMST	Distribution: This species is known to occur as only a few disjunct populations; in the Petford district, west of the Atherton Tablelands, Taravale, Wandovale and White Mountains, north of Torrens Creek (DEWHA 2008). Habitat preferences: Known habitat includes sparse <i>Eucalyptus sideroxylon</i> woodland with a grassy understorey, often on rocky slopes in shallow, red, stony loams (DEWHA 2008). Notable features: This is a distinctive small to medium cycad with a trunk to 2 m (DEWHA 2008). Dispersal mode: Gravity (generally not too far from base of plant) and occasionally mammals, birds and bats. Nearest record: The nearest published record for this species is more than 120 km to the east of the project site (CSIRO 2022).	Low: This vegetatively distinct species was not observed during extensive flora surveys and vegetation assemblages and underlying geology is not suitable for this species in the project site.
<i>Drummondita calida</i> (no common name)	Vulnerable	Not listed	Wildlife Online, AVH	Distribution: A very restricted stiff shrub in north Queensland, being found from Bulleringa National Park in the north to the southern end of the Gregory Range. Populations are also	Moderate: This species was not identified during the field surveys, and it is unlikely to occur in large numbers within

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
				known to occur in Nitmiluk National Park in the Northern Territory (Duretto 2018; Wilson 2013). It has been recorded at a number of locations between Woolgar and Northhead in north Queensland (CSIRO 2022). Habitat preferences: In Queensland, this species has been found in several sites from very exposed and sparse low shrubland on bare sandstone plateaux to low open woodlands on sandstone with large boulders (Duretto 2018; Wilson 2013). Notable features: Its habit/appearance is driven by habitat with taller individuals occurring in woodlands and shorter plants in the more open and exposed situations. Dispersal mode: Seeds are probably released ballistically from fruits at maturity, followed by secondary seed dispersal primarily by ants. There is a high level of seed dormancy at release in the Rutaceae family, and members are likely to have persistent seed banks with germination linked to fire (Auld 2001). Nearest record: There is an Atlas of Living Australia record of this species, possibly from 2004, approximately 25 km east of the project site (CSIRO 2022). There is also an essential habitat area mapped at this location.	the project site as this would have been identified during the surveys. However, a small number of individuals may occur on the plateaus and associated gullies in the east of the project site that were not detected during field surveys. Potential habitat for this species occurs in woodland comprised of Newcastle Range Bloodwood (<i>Corymbia serendipita</i>) and Darwin Woollybutt (<i>Eucalyptus miniata</i>) on the sandstone scarps located throughout the project site (i.e. RE 2.10.2x5a). This species is unlikely to occur within the majority of the proposed project footprint as this area was searched in detail for threatened and near threatened species and none were detected.

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
<i>Eucalyptus approximans</i> (no common name)	Near threatened	Not listed	AVH	There is one 1979 record of this species within the search area. <i>Eucalyptus approximans</i> subsp. <i>codonocarpa</i> was superseded by <i>Eucalyptus codonocarpa</i> in Queensland in 2019. <i>E. codonocarpa</i> is listed as near threatened under the NC Act. However, it is considered likely that this is an erroneous search result and the coordinates associated with this record are incorrect as this species is only known from New South Wales and the border of New South Wales and Queensland and the record notes the locality as '1 km SW of Mt Norman', which is a location at Girraween in far southern Queensland (CSIRO 2022).	
Forest Phebalium (<i>Leionema ambiens</i>)	Near threatened	Not listed	AVH	There is one 1998 record of this species within the search area. It is considered likely that this is an erroneous search result and the coordinates associated with this record are incorrect as this species is only known from New South Wales and the border of New South Wales and Queensland and the record notes the locality as 'Mount Norman', which is a location at Girraween in far southern Queensland (CSIRO 2022).	
<i>Labichea brassii</i> (no common name)	Near threatened	Not listed	Wildlife Online, AVH	Distribution: An uncommon shrub species endemic to north Queensland. Known from Mt Mulligan in the north through to south-west to Agate Creek (ABRS 1998). Habitat preferences: This species occurs on sandstone hills and has also been recorded growing along creek and river beds (ABRS 1998). Dispersal mode: Invertebrate dispersed, particularly ants – arillate seed. Nearest record: The nearest record is approximately 23 km north of the project site	Moderate: This species was not identified during the field surveys, and it is unlikely to occur in large numbers within the project site as this would have been identified during the surveys. However, a small number of individuals may occur on the plateaus and associated gullies in the east of the project site that were not detected during

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
				(CSIRO 2022). There is also an essential habitat area mapped at this location.	field surveys. Potential habitat for this species occurs in woodland comprised of Newcastle Range Bloodwood and Darwin Woollybutt on the sandstone scarps (RE 2.10.2x5a), which is located throughout the north-eastern portion of the project site. This species is unlikely to occur within the proposed project footprint as this area was searched in detail for threatened and near threatened species and none were detected.
<i>Leptospermum pallidum</i> (no common name)	Near threatened	Not listed	Survey	Distribution: This species has a restricted distribution in the northern Queensland, mostly in the Greenvale area, but also at Porcupine Gorge, north of Hughenden (Bean 1992). Habitat preferences: The species typically occurs on lateritic ridges, often on cliff edges with skeletal soils. The species sometimes occurs vine thicket communities on rock slopes (Bean 1992). Notable features: <i>Leptospermum pallidum</i> flowers from March to June (Bean 1992).	High: This species was recorded 300 m east of the project site during the seasonal surveys. The distribution of <i>L. pallidum</i> was associated with the small cliffs and boulder fields at the edge of and/or beneath the sandstone scarps in the eastern portion of the project site in RE 2.10.2x5a

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
				Dispersal mode: Seed dispersal is most likely dispersed through gravity, wind and water. Nearest record: This species was recorded approximately 300 m east of the project site during the field surveys.	(Figure 6). Although no individuals were mapped within the project site, habitat is present along the north-eastern portion of the project site.
Pink Gidgee (<i>Acacia crombiei</i>)	Vulnerable	Vulnerable	PMST, Wildlife Online, AVH	Distribution: Pink Gidgee is endemic to central Queensland where it occurs in isolated populations. Populations occur from Muttaborra in the south to Richmond and Hughenden in the north. It is listed as occurring in the Burke, Mitchell, and North Kennedy pastoral regions and is protected within Porcupine Gorge National Park (TSSC 2008). Habitat preferences: Pink Gidgee is an uncommon species occurring in small, isolated populations (TSSC 2008). In the north and north-east of its range, Pink Gidgee is most often found on basalt, but the species is generally found on heavier, loamy soils in the south of its range (TSSC 2008). Associated species include Gidgee (<i>Acacia cambagei</i>), Whitewood (<i>Atalaya hemiglauca</i>) and Cabbage Tree Wattle (<i>Acacia cana</i>) (TSSC 2008). Notable features: <i>Acacia crombiei</i> is a tree growing to 10 m high with globular flower heads. Phyllodes are pale green and narrowly	Low: This species was not observed during extensive flora surveys and vegetation assemblages and underlying geology is not suitable for this species in the project site.

Common name (Species name)	NC Act status	EPBC Act status	Record source ¹	Habitat preferences	Likelihood to occur in the project site
				linear, growing 10–15 cm long and 3–8 mm wide. Pods are narrowly oblong, growing to 10 cm long (TSSC 2008). Dispersal mode: Explosive release; invertebrate dispersed, particularly ants – arillate seed. Nearest record: The nearest record is approximately 25 km south of the project site (CSIRO 2022).	
Wallangarra White Gum (<i>Eucalyptus scoparia</i>)	Vulnerable	Vulnerable	AVH	There is one 1979 record of this species within the search area. It is considered likely that this is an erroneous search result and the coordinates associated with this record are incorrect as this species is only known from southern Queensland and New South Wales and the record notes the locality as the 'peak SW of Mt Norman', which is a location at Girraween in far southern Queensland (CSIRO 2022).	

¹PMST – EPBC Act Protected Matters Search Tool
AVH – Australasian Virtual Herbarium

Table D2: Assessment of likelihood for residual threatened, near threatened and special least concern fauna species returned from database searches to occur in the project site

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
Birds					
Australian Painted Snipe (<i>Rostratula australis</i>)	Endangered	Endangered	PMST	Distribution: The Australian Painted Snipe has been recorded at wetlands in all states of Australia. It is most common in eastern Australia. This population is considered to occur as a single, contiguous breeding population (DAWE 2022a). General habitat preferences: This secretive, cryptic, crepuscular (active at dawn, dusk and during the night) species occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, salt-marsh, dams, rice crops, sewage farms and bore drains with rank emergent tussocks of grass, sedges, rushes or reeds or samphire, and often with scattered clumps of Lignum (<i>Muehlenbeckia florulenta</i>), canegrass or sometimes tea trees (DAWE 2022a). Foraging habitat: The species feeds on vegetation, seeds, and invertebrates including crustaceans and molluscs as well as insects, worms and other invertebrates. Foraging habitats are not well understood (Marchant and Higgins 1994). Breeding habitat: Requirements are specific and include shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Almost all records of nests occur on or near small	Low: This species was not recorded from the project site during the seasonal fauna surveys. Suitable wetland habitat with fringing vegetation is not present in the project site.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				islands in freshwater wetlands characterised by a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover. Although this species uses modified habitat, it doesn't necessarily breed in these habitats. It most likely breeds in response to wetland conditions rather than during a particular season (DAWE 2022a). Nearest Record: There are no records of this species within 50 km of the project site. The nearest published record of this species is approximately 70 km north of the project site near Forsayth (CSIRO 2022).	
Black-throated Finch (Southern) (<i>Poephila cincta cincta</i>)	Endangered	Endangered	Wildlife Online	Distribution: The Black-throated Finch (Southern) occurs at two general locations: in the Townsville region, where it is considered to be locally common at a few sites around Townsville and Charters Towers (Garnett and Crowley 2000). It has also been recorded at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park) (DAWE 2022b). DCCEEW considers birds recorded since 1998, at the following locations to be part of the southern subspecies: ▪ Townsville and its surrounds (Giru, Serpentine Lagoon, Toonpan, and near Ross River Dam) ▪ Ingham, and sites nearby (near Mutarnee [at Ollera Creek], and near Mount Fox)	Low: Potentially suitable grassy riparian habitat is present within the project site along the Woolgar River and a number of unnamed tributaries. However, preferred grass species are sporadic, with wire-grasses being more prevalent in the ground layer throughout the project site. There are historical records of the species from the broader region. However, many of these records are

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				scattered sites in central-eastern Queensland (Great Basalt Wall, Yarrowmere Station, Moonoomoo Station, Doongmabulla Station, Fortuna Station and Aramac) (DAWE 2022b). This species has undergone a significant range contraction from the southern parts of its former distribution. It has not been recorded in south-east Queensland since the early 80s and is now thought to be extinct in NSW. It is noted as being mostly absent from the coastal plain but occasionally recorded from the area around Townsville and Ingham (Higgins et al. 2006). General habitat preferences: This species is known from dry, open grassy woodlands and forests and grasslands of the sub-tropics and tropics with seeding grasses and ready access to water (Higgins et al. 2006). Also thought to probably require a mosaic of different habitat in the wet season to find seed (Garnett et al. 2011). Black-throated Finch mainly inhabit dry open to very open eucalypt woodlands with dense grassy ground cover and often along watercourses or in the vicinity of water (DAWE 2022b; Marchant et al. 2006). Almost all recent records of this species, south of the tropics, have been from riparian habitat. It is thought that permanent sources of water and surrounding habitat provides refuge for this species during the dry season and particularly during drought	undated and few indicate the subspecies recorded. Therefore, many are likely to be the more common northern subspecies. There are a handful of published records of the southern subspecies between the project site and Charters Towers (approximately 300 km to the east) (CSIRO 2022). The project site is not located in or near an important habitat area for this species, which are in the greater Townsville and Charters Towers region, Ingham and scattered sites in central eastern Queensland (DAWE 2022b). This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				conditions. This species has been recorded in degraded habitats such as heavily grazed paddocks (DAWE 2022b). The Commonwealth significant impact guidelines define important habitat areas for this species as: - the greater Townsville region; and - habitat within 5 km of post-1995 sightings of this species (DEWHA 2009). Foraging habitat: This subspecies is thought to require a mosaic of different habitats in which it can find seed during the wet season (DAWE 2022b). Both native and exotic grass species are consumed. Key species include; Sabi Grass (<i>*Urochloa mosambicensis</i>), Curly Windmill Grass (<i>Enteropogon acicularis</i>), Native Millet (<i>Panicum decompositum</i>), Hairy Panic (<i>Panicum effusum</i>), Queensland Bluegrass (<i>Dichanthium sericeum</i>), Cockatoo Grass (<i>Alloteropsis semialata</i>), Lovegrass (<i>Eragrostis sororia</i>) and Kangaroo Grass (<i>Themeda triandra</i>) (DEWHA 2009). Other grasses thought to be used by the species include: Golden Beard Grass (<i>Chrysopogon fallax</i>), Pitted Bluegrass (<i>Bothriochloa decipiens</i>), Windmill Grass (<i>Chloris spp.</i>), Fairy Grass (<i>Sporobolus caroli</i>), Wanderrie Grass (<i>Eriachne armittii</i>) and Pigeon Grasses (<i>Setaria apiculata</i> and <i>Setaria surgens</i>). The species appears to avoid Black Speargrass (<i>Heteropogon contortus</i>), wire grasses (<i>Aristida spp.</i>) and perhaps Kangaroo Grass (<i>Themeda triandra</i>) (Black-	

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				throated Finch Recovery Team 2011). Thick impenetrable swards of grasses is likely to be less suitable as access for foraging is difficult (Buosi 2011). Breeding habitat: Nests are often built in taller trees and shrubs, in a hollow branch of a tree, or in a fork of a tree, shrub or sapling. It is not uncommon for nests to be placed in other sites, such as in tall grass, amongst mistletoe, beneath active raptor nests, or in an old nest of a Babbler (<i>Pomatostomus</i> spp.) or Diamond Firetail (<i>Stagonopleura guttata</i>) (DAWE 2022b). Nest sites tend to be located in close proximity to water, i.e. probably within 1 km as indicated in the Commonwealth significant impact guidelines for the species (DEWHA 2009). Nearest record: There are numerous records of the Black-throated Finch in the broader region, particularly to the north and north-west, including one within approximately 17 km south-west of the project site. However, none of these records identify the subspecies. The next nearest Atlas of Living Australia record of the southern sub-species is approximately 165 km east of the project site (CSIRO 2022).	
Curlew Sandpiper	Critically endangered	Critically Endangered /Migratory	PMST	Distribution: This species occurs along the coasts but is also widespread inland. In Queensland there are scattered records in the Gulf of Carpentaria, widespread records along the coast, south of	Low: This species is only recorded occasionally from suitable inland habitats. Natural wetland habitats do

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
(<i>Calidris ferruginea</i>)				Cairns, and sparsely scattered records inland (DAWE 2022c). General habitat preferences: Near the coast it inhabits intertidal mudflats in sheltered areas, such as estuaries, bays inlets and lagoons and non-tidal swamps, lakes, lagoons, ponds in saltworks and sewage farms. Inland they are occasionally recorded around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They will use fresh and brackish habitats and floodwaters (DAWE 2022c). Foraging habitat: This species usually wades and forages in waters 15-30 mm deep, but up to 60 mm deep at the edge of saltmarsh, emergent vegetation and inundated saltflats. It feeds on invertebrates, including worms, molluscs, crustaceans and insects, as well as seeds (DAWE 2022c). Roosting habitat: The species usually roosts on bare dry shingle, shell or sand beaches, sand spits and islets and sometimes in dunes (DAWE 2022c). Nearest record: This species has not been recorded within 50 km of the project site. The nearest published record of the species is approximately 150 km north-east and 180 km south-west of the project site near Julia Creek (CSIRO 2022).	not occur within the project site. This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
Gouldian Finch (<i>Erythrura gouldiae</i>)	Endangered	Endangered	PMST	Distribution: The Gouldian finch is found across northern Australia, from Cape York Peninsula in Queensland, through to the north of the Northern Territory and into the Kimberly region of Western Australia. It is thought that the one continuous genetic population exists across its range (TSSC 2016a). General habitat preferences: The habitat in which the Gouldian finch occurs is grassy tropical open woodlands, often bordering watercourses, and occasionally open grassy plains and spinifex areas (EHP 2013). The Gouldian Finch is seldom found far from water, and needs to drink several times during the day. Throughout its range the species inhabits the edges of mangroves and thickets, and savannas dotted with trees (Australian Museum 2020). Feeding habitat: This species feeds almost exclusively on grass seed from a small number of species (TSSC 2016a). Dry season feeding habitat is dominated by annual spear grasses or native sorghum (<i>Sarga</i> species), and in the wet season birds shift to feeding from scattered patches of cockatoo grass (<i>Alloteropsis semialata</i>), golden beard grass (<i>Chrysopogon fallax</i>) or spinifex-dominated communities (<i>Triodia bitextura</i>; <i>T. acutispicula</i>; <i>T. bynoei</i>; <i>T. schinzii</i>). Other important wet season grasses include giant spear grass (<i>Heteropogon triticeus</i>), white grass (<i>Sehima nervosum</i>), ricegrass (<i>Xerochloa laniflora</i>) and	Low: The project site is located close to the southern extent of this species' known distribution and no records of this species occur within 100 km of the project site. This species was not recorded from the project site during the seasonal fauna surveys despite targeted water point watches.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				kangaroo grass (<i>Themeda triandra</i>) (O'Malley 2006). Breeding habitat: This species nests in tree hollows generally between April and July (TSSC 2016a). Breeding habitat for Gouldian Finches is characterised by rocky hills with hollow-bearing smooth-barked gums (<i>Eucalyptus brevifolia</i> or <i>E. tintinnans</i>) and an understory of preferred grasses within two to four kilometres of small waterholes or springs that persist throughout the dry season (O'Malley 2006; Pizzey et al. 2012; TSSC 2016a). Nearest record: There are no records of this species within 50 km of the project site. The nearest published record is approximately 120 km north of the project site near Georgetown (CSIRO 2022).	
Grey Falcon (<i>Falco hypoleucos</i>)	Vulnerable	Vulnerable	PMST	Distribution: This species occurs in low densities across arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant S. and Higgins 1993; TSSC 2019). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. In Queensland, the species is generally absent from the Cape York Peninsula and areas east of the Great Dividing Range (TSSC 2019).	Low: This species is a rare vagrant closer to the coast when wet years in arid and semi-arid areas are followed by drought. Broadly suitable habitat is present for this species and it is believed to move considerable distances in response to seasonal conditions. However, this species was not recorded in the project site during the seasonal field surveys and

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				General habitat preferences: The Grey Falcon is typically associated with timbered lowland plains, particularly <i>Acacia</i> shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (TSSC 2019). Breeding habitat: This species breeds in old nests of other birds, particularly those of other raptors or corvids. The nests chosen are usually in the tallest trees along watercourses, particularly River Red Gum (<i>Eucalyptus camaldulensis</i>) and Coolibah (<i>E. coolabah</i>), but falcons also nest in telecommunication towers (TSSC 2019). Nearest record: There are no records of this species within 50 km of the project site. However, there are numerous records across the gulf region, with the closest occurring appropriately 100 km to the north and south of the project site (CSIRO 2022).	although there are records in the Gulf region, the species has not been recorded within 100 km of the project site (CSIRO 2022). Furthermore, climatic conditions in the region are possibly wetter (i.e. annual rainfall has fluctuated in recent years from below 300 mm to greater than 700 mm) and more sub-tropical than those preferred by this species. Therefore, this species is considered to have a low likelihood to use the project site and its presence in the area would more likely be as a rare vagrant rather than resident in any given location.
Masked Owl (Northern) (<i>Tyto novaehollandiae kimberli</i>)	Vulnerable	Vulnerable	PMST	Distribution: Three subpopulations of this species are known: in Kimberley, Northern Territory and Cape York. In Queensland it is known on Cape York Peninsula along the southern rim of the Gulf of Carpentaria near Normanton and south to the	Low: This species was not recorded from the project site during the seasonal fauna surveys. The project site lacks dense habitats

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				Atherton Tablelands and the Einasleigh-Burdekin divide (DAWE 2022d). General habitat preferences: In northern Australia, the Masked Owl has been recorded from riparian forest, rainforest, open forest, <i>Melaleuca</i> swamps and the edges of mangroves, as well as along the margins of sugar cane fields. The species feeds in 'open woodland on small to medium-sized terrestrial mammals' (DAWE 2022d). Breeding habitat: The species requires large trees with large hollows for nesting and usually within closed forests (DAWE 2022d). Nearest record: There are no records of this species within 50 km of the project site. The nearest published record of this species is more than 160 km south-east of the project site in White Mountains National Park (CSIRO 2022).	such as rainforest and melaleuca swamps and the species has not been recorded within 100 km of the project site.
Painted Honeyeater (<i>Grantiella picta</i>)	Vulnerable	Vulnerable	PMST	Distribution: This species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. Greatest concentrations, including all breeding records, come from south of 26°S, on inland slopes of the Great Dividing Range between the Grampians in Victoria and Roma in Queensland. After breeding, many birds move to semi-arid regions such as north-eastern South Australia, central and western Queensland and central Northern Territory. This	Low: This species is a non-breeding migrant to northern Queensland and predominately feeds on mistletoes. The woodland vegetation in the project site does not support a high abundance of mistletoe that provides suitable foraging resources for this species.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				species is considered to have a single population (TSSC 2015). General habitat preferences: This species occurs in mistletoes in eucalypt forests, woodlands, riparian woodlands of Black Box and River Red Gum, Box-Ironbark-Yellow Gum woodlands, Wattle woodlands, Paperbarks, Casuarinas, Cypress, and trees on farmland or gardens. The species prefers woodlands with a higher number of mature trees, as these generally support more mistletoes. More common in larger remnant tracts, rather than narrow remnant strips (TSSC 2015). Breeding preferences: Breeding season is closely aligned with fruiting of mistletoe, therefore north-south movements have been observed (TSSC 2015). It has been known to breed in narrow roadside strips if ample mistletoe fruit is present. The species appears to prefer mistletoe as a nest substrate and is likely to be attracted to habitats where mistletoe is prevalent and parasitism rates are high (TSSC 2015). Nearest Record: There are no records of this species within 50 km of the project site. The nearest published record of this species is approximately 120 km south-west of the project site (CSIRO 2022).	This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	Endangered	Vulnerable	PMST	Distribution: This species is sparsely dispersed across coastal and sub-coastal Australia from western Kimberly Division to north-eastern New South Wales and occasionally on continental islands (DAWE 2022e). General habitat preferences: This species occurs in woodlands and forests, ideally with a mosaic of vegetation types, large prey populations (birds) and permanent water, particularly riverine forests. Vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins (DAWE 2022e). The species avoids both very dense and very open habitats. They are solitary and secretive birds and hunt mainly from ambush. Their prey is mostly birds, but also mammals, reptiles and insects (Marchant and Higgins 1994). Breeding habitat: Nests are restricted to trees taller than 20 m and within 1 km of a watercourse or wetland. It is thought to rarely breed in areas with fragmented native vegetation (Garnett et al. 2011). Home ranges of 120 km² and 200 km² for females and males, respectively have been recorded (Marchant and Higgins 1994). Nearest Record: There are no records of this species within 50 km of the project site. There are no recent records in the region, the nearest published record of this species, which is undated,	Low: The project site lacks riverine habitats with permanent water and contains mostly open woodland vegetation types. The species has not been recently recorded within 300 km of the project site. This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				is 160 km south-east of the project site south of Hughenden (CSIRO 2022).	
Squatter Pigeon (Southern) (<i>Geophaps scripta</i>)	Vulnerable	Vulnerable	Wildlife Online, ALA	Distribution: The southern sub-species of the Squatter Pigeon is described as occurring south of the Burdekin River-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern New South Wales, and from the east coast to Hughenden, Longreach and Charleville (Higgins and Davies 1996). The known distribution of the southern sub-species overlaps with the known distribution of the northern subspecies (DAWE 2022f). General habitat preferences: This species is known from tropical dry, open sclerophyll woodlands and sometimes savannah with <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species in the overstorey. The groundcover layer is patchy consisting of native, perennial tussock grasses or a mix of grasses and low shrubs or forbs. However, the groundcover layer rarely exceeds 33% of the ground area. It appears to favour sandy soil dissected with low gravelly ridges and is less common on heavier soils with dense grass cover. It is nearly always found in close association i.e. within 3 km, with permanent water. While the species is unlikely to move far from woodland trees, where scattered trees still occur and the distance of cleared land between remnant trees or patches of habitat does not exceed 100 m, individuals may be	Present: This species was recorded from the project site during the seasonal fauna surveys. This species was also observed at a number of locations in the project site during the 2017 and 2021 flora surveys. Both the northern and southern sub-species are present in the project site as well as hybrids. The species is largely associated with the grassy woodlands on land zone 3 and 5 within 3 km of permanent water. This species is a MNES and has been addressed in a separate MNES report (Eco Solutions & Management 2022).

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				found foraging in, or moving across modified or degraded environments (DAWE 2022f). Foraging habitat: This occurs in any remnant or regrowth open-forest to sparse, open woodland or scrub dominated by <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species, on sandy or gravelly soils within 3 km of a suitable, permanent or seasonal waterbody (DAWE 2022f; Squatter Pigeon Workshop 2011). In Central Queensland the Squatter Pigeon is frequently observed in cattle yards where water troughs are present (S. Marston pers observations). It feeds primarily on seeds of grasses, herbs and shrubs (DAWE 2022f). Breeding habitat: This occurs on well-draining, stony rises occurring on sandy or gravelly soils or on low 'jump-ups' and escarpments (i.e. land zones 5 and 7), within 1 km of a suitable, permanent waterbody (DAWE 2022f). Dispersal habitat: This can be any forest or woodland occurring between patches of foraging or breeding habitat, and suitable waterbodies and may include denser patches of vegetation not suitable for foraging or breeding. Where scattered trees still occur, and the distance of cleared land between remnant trees or patches of habitat does not exceed 100 m, the species may forage or disperse through degraded environments (DAWE 2022f). Notable features: This species can breed throughout most of the year, however, peak	

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				breeding is generally April to October when the primary source of food, grass seed, is most abundant (DAWE 2022f). Nearest Record: This species was recorded within and nearby the project site during the field surveys.	
Star Finch (Southern) (<i>Neochmia ruficauda ruficauda</i>)	Endangered	Endangered	PMST	Distribution: The distribution of the Star Finch is poorly known. It is thought to occur between Bowen in the north, Winton in the west and Wowan in the south (DAWE 2022g). However, this species' range has largely contracted to southern Cape York. There have not been any confirmed records from the Cairns to Townsville region for some time and none were recorded during the Birds Australia Atlas project. Recent records around Rockhampton are thought likely to be aviary escapees (Higgins et al. 2006). General habitat preferences: This species usually inhabits low dense damp grasslands bordering wetlands and waterways and also open savannah woodlands near water or subject to inundation but is absent from expanses of open country and uplands, usually occurring in valleys (Higgins et. al. 2006). It also occurs in cleared or suburban areas. Woodland communities in which it occurs include <i>Eucalyptus coolabah</i> , <i>E. tereticornis</i> , <i>E. tessellaris</i> , <i>Melaleuca leucadendra</i> , <i>E. camaldulensis</i> and <i>Casuarina cunninghamii</i> (DAWE 2022g).	Low: Suitable dense, damp grasslands bordering wetlands and waterways were not present within the project site. This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				Foraging habitat: It feeds on grass and shrub seeds, most likely from <i>Arundinella</i>, <i>Brachyachne</i>, <i>Chloris</i>, <i>Chrysopogon</i>, <i>Digitaria</i>, <i>Echinochloa</i>, <i>Heterachne</i>, <i>Iseilema</i>, <i>Oryza</i>, <i>Panicum</i>, <i>Setaria</i>, <i>Sorghum</i>, <i>Themeda</i>, <i>Urochloa</i>, <i>Casuarina</i>, <i>Fimbristylis</i> and <i>Tridax</i> species. It also feeds on insects. It has been recorded foraging, in the shade of eucalypt species, on the ground (DAWE 2022g). Breeding habitat: Nesting occurs in November, with eggs recorded from February to May and in September. Nests are thought to be bottle-shaped and placed in trees, amongst grass, sedges or reeds, at heights of approximately 3-9 m above the ground (DAWE 2022g). Nearest Record: There are no records of this species within 50 km of the project site. The nearest record of this species is approximately 175 km north of the project site near Georgetown (CSIRO 2022).	
Mammals					
Ghost Bat (<i>Macroderma gigas</i>)	Endangered	Vulnerable	PMST	Distribution: It is predicted, based on analysis of historic climatic data, fossils, and modelling that the Ghost Bat is a geographically relictual species in southern, arid landscapes, present only because caves provide suitable roost microclimates (TSSC 2016b). Although this species is thought to once occupy much of Australia, its current range is discontinuous across northern Australia, with	Low: The desktop assessment and field surveys: • did not identify any permanent Ghost Bat roost habitat within the project site or within the maximum known

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				colonies known in the Pilbara, Kimberly, northern Northern Territory, the Gulf of Carpentaria, coastal and near coastal eastern Queensland from Cape York to near Rockhampton and the Riversleigh and Camooweal districts in western Queensland and occupying both arid and lush rainforest habitats (TSSC 2016b; van Dyck and Strahan 2008). The project site is located within a mapped gap in between eastern and western distributions. Permanent breeding habitat: When breeding, Ghost Bat individuals concentrate in permanent roost sites that include large, complex cave systems. In the Pilbara, Kimberley and Northern Territory permanent roost sites have also been identified in large, abandoned underground mines. The permanent breeding roosts all contain at least one roosting chamber deep within the cave/mine and behind a reasonably narrow entrance or cave-in constriction. The ceiling in the roosting chamber often has cracks and a rough natural rock surface that allows the bats grip to roost. The ceiling heights of the roosts are over 1.5 m, and usually higher than 2 m, to provide protection from terrestrial predators and the roosting chamber holds a steady microclimate. The depth of the roosting caves vary from shallow, 20 m deep caves to caves over 500 m deep. The Draft National Recovery Plan for the Ghost Bat (DCCEEW 2025) cites research from the Pilbara that	dispersal range of the species (268 km) from the project site • did not identify any records of Ghost Bats in the project site or within 50 km of the project site. There are small amounts of potential temporary roost habitat for this species in the sandstone escarpment areas along the eastern boundary of the project site, as well as one historic gold working in the north-east project site. However, there was no evidence that the Ghost Bat used these potential temporary roost habitats (e.g. no bat scats). This is as expected given there is no permanent breeding roosts within the dispersal range (268 km) of the project site. In addition, temporary roosts are not considered critical habitat for the Ghost Bat as they are not essential to the

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				identified high levels of population connectivity within 250 km of a permanent breeding roost site, which is likely to be driven by male dispersal. The longest recorded Ghost Bat dispersal was 268 km. The Draft National Recovery Plan for the Ghost Bat also states that in the Central Queensland Coast region, there does not appear to be any connectivity between the Mt Etna and Cape Hillsborough populations that are approximately 300 km apart. The closest permanent breeding roost site record within 300 km of the project site is at Girringun, approximately 295 km from the project site. This roost site is more than 268 km (the longest recorded dispersal distance of the Ghost Bat) from the project site. Hence, it is unlikely that any Ghost Bats from this permanent breeding roost site would make use of any habitat in the project site. Temporary roosting habitat: During the cooler, non-breeding months of the year, Ghost Bats disperse widely in small groups (usually a single pair) up to 268 km from the permanent breeding roosts. During dispersal, the Ghost Bat accesses its ephemeral and patchy food sources and uses a range of temporary roost sites such as shallow caves, rock shelters, deep overhangs, and vertical cracks. There is limited published knowledge on the specific characteristics of the temporary roost sites, but the temporary roosts are not considered critical habitat for the Ghost Bat as they are not essential	long-term viability of the Ghost Bat population. Therefore, it is considered that there is a low likelihood for this species to use the project site. Greg Ford, is a terrestrial ecologist with more than 25 years' experience and a recognised bat expert who has analysed hundreds of hours of acoustic bat records from north Queensland. Mr Ford analysed all the Anabat calls from the BVS field survey and did not detect any Ghost Bat calls from the BVS project site. He indicated, based on his assessment of the BVS project site and satellite imagery of the region, as well as his knowledge of the Woolgar, Chudleigh and Blackbraes area, that the Ghost Bat is unlikely to occur in the BVS project

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				to the long-term viability of the Ghost Bat population (Bat Call WA, 2021). Desktop searches identified the presence of historic gold workings in the BVS project site, including the presence of shallow pits and a small number of shallow mine shafts. The field survey identified one moderate sized historic gold working in the north-east of the project site and the sandstone outcrops and escarpment area along the eastern boundary of the project site that could provide suitable temporary Ghost Bat roosting habitat. However, there was no evidence during the field surveys of any bats, including the Ghost Bat, using these areas. This is consistent with the publicly available information that indicates there are no Ghost Bat permanent breeding roost site records within the dispersal range of the species from the project site (268 km). Both of these areas are also beyond the project disturbance footprint. General habitat preferences: Habitat is comprised of thicket, open woodland, and spinifex and black soil grasslands (van Dyck et al. 2013; van Dyck and Strahan 2008). Monsoon forests, open savannah woodland, tall open forest, deciduous vine forest and tropical rainforest is also used (Churchill 2009). Cave habitat is important for roosting and breeding (van Dyck and Strahan 2008). Ghost bats usually require a number of caves to move between seasonally (TSSC 2016b).	site (Greg Ford pers. comm. 2025). Greg Ford's assessment is consistent with the findings of this report.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				Foraging habitat: This is Australia's only true carnivorous bat, feeding on frogs, lizards, birds, small mammals and sometimes other bats (TSSC 2016b; van Dyck and Strahan 2008). It captures prey on the ground and then returns to an established feeding site, e.g. rock overhang or small cave, to feed (van Dyck and Strahan 2008). This species has been recorded foraging between 1.9 km and 12 km from day roosts and will use the same foraging area each night (Bat Call WA 2021). Foraging areas are approximately 60 ha in size (Churchill 2009; TSSC 2016b). Nearest Record: There are no records of Ghost Bats in the project site and this species has not been recorded within 50 km of the project site.	
Greater Glider (<i>Petauroides volans</i>)	Vulnerable	Vulnerable	PMST	Distribution: This species is restricted to eastern Australia, between Windsor Tableland in north Queensland and Wombat State Forest in central Victoria. It occurs from sea level up to 1,200 m above sea level (DCCEEW 2022). General habitat preferences: The Greater Glider occurs in a range of eucalypt-dominated habitats, including low open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range. It does not use rainforest habitats (van Dyck et al. 2013; van Dyck and Strahan 2008). This species favours taller, montane, moist eucalypt forests on fertile soils,	Low: The surveys found that, with the exception of the community along the Woolgar River, the riparian communities support a relatively low abundance of large mature hollow-bearing trees. Therefore, potential habitat for the Greater Glider in the project site is likely to be restricted to the riparian

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				with relatively old trees and abundant hollows and a diversity of eucalypt species (DCCEEW 2022). The Greater Glider has an almost exclusive diet of eucalypt leaves and occasionally flowers or buds (DCCEEW 2022; van Dyck and Strahan 2008). Although the species is known to feed on a range of eucalypt species, in any particular area it is likely to only forage on one or two species (van Dyck and Strahan 2008). Breeding habitat: Breeding occurs between March and June and a single young is born each year (DCCEEW 2022; van Dyck and Strahan 2008). The young stays with the mother or is left in the nest and becomes independent at about 9 months (Menkhorst and Knight 2011). Notable features: This species appears to have low dispersal ability and typically small home ranges of 1-4 ha. In lower productivity forests, home ranges may be as large as 19 ha for males. Male home ranges generally do not overlap (DCCEEW 2022). It may glide over distances of up to 100 m. It is a nocturnal species and uses tree hollows during the day to rest (van Dyck and Strahan 2008). Nearest Record: This species has not been recorded within 50 km of the project site. The subspecies <i>Petauroides volans minor</i> has been recorded throughout Blackbraes National Park and	vegetation communities fringing the Woolgar River. There are records in the broader region from an isolated population in the Gregory Range, approximately 75 km to the north-east of the project site (CSIRO 2022). However, these records are located on the eastern side of the range and there are no published records from the Gulf Plains catchments, i.e. west of this range. This species was not recorded in the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				environs at least 60 km north north-east of the project site (CSIRO 2022).	
Julia Creek Dunnart (<i>Sminthopsis douglasi</i>)	Endangered	Vulnerable	PMST	Distribution: This species of Dunnart is only known from a small area from between east of Cloncurry and Barcaldine in central western Queensland in the Mitchell Grass Downs and Desert Uplands bioregions (DAWE 2022h; TSSC 2016c). General habitat preferences: The habitat of this species is Mitchell Grasslands, on heavy clay soils (cracking clay) of two types (ashy and stony) and dominated by Mitchell Grass (<i>Astrebla</i> spp.) and Flinders Grass (<i>Iseilema</i> spp.). It shelters in soil cracks in areas of sparse and dense ground cover. The characteristics of the substrate appears to be an important factor in habitat selection by this species (DAWE 2022h). Foraging habitat: The species feeds on insects (silverfish, cockroaches, rickets and slaters), spiders, centipedes, scorpions, skinks and Long-tailed Planigales (DAWE 2022h). Breeding habitat: The Julia Creek Dunnart breeds in spring and summer. They build nests within grass tussocks, amongst dense cover (DAWE 2022h). Nearest Record: This species has not been recorded within 50 km of the project site. The nearest published record of this species is approximately 100 km south-south-west of the project site, near Richmond (CSIRO 2022).	Low: This species is endemic to Queensland and its known distribution and preferred habitat characteristics are highly restricted. The project site is not within the bioregions known to support this species. The species is known to occur in areas of heavy cracking clay soils with native grasses, where it is believed to be more reliant on the cracking nature of the substrate for shelter as this is more reliable than vegetative cover. The project site does not contain heavy cracking clay soils and the preferred <i>Iseilema</i> and <i>Astrebla</i> tussock grass species are not present in the project site. This species was not recorded from the project

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
					site during the seasonal fauna surveys.
Koala (<i>Phascolarctos cinereus</i>)	Vulnerable	Endangered	PMST, Wildlife Online	Distribution: This species is widespread in sclerophyll forest and woodlands on foothills and plains on both sides of the Great Dividing Range from about Chillagoe, Queensland to Mt Lofty Ranges in South Australia (Menkhorst and Knight 2011). In Queensland the species is thought to occur in eight bioregions; Einasleigh Uplands, Wet Tropics, Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North and Brigalow Belt South. In many locations Koalas are of low density, widespread and fragmented (DAWE 2022i). General habitat preferences: Koalas in Queensland use a range of habitats, including moist coastal forests, southern and central western sub-humid woodlands, and a number of eucalypt woodlands adjacent to waterbodies in the semi-arid western parts of the state (DAWE 2022i). These habitats may include forests or woodlands, road-side and rail vegetation and paddock trees, safe intervening ground matrix for travelling between trees and patches (DAWE 2022i). In the northwest of Queensland, studies have found that Koalas are patchily distributed, associated with creek-lines, areas of higher tree species richness and with	High: The distinctive scats and scratches of this species were observed during the dry season fauna surveys. Scats were recorded from the bed of the Woolgar River to the north and north-west of the project site. Riparian refuge habitat is present along the Woolgar River and in Eucalypt communities where River Red Gum is present, along and between drainage lines within the project site (Figure 6). This species is a MNES and has been addressed in a separate MNES report (Eco Solutions & Management 2022).

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				higher abundance correlating with leaf-moisture content (DAWE 2022i). Foraging habitat: The diet of the Koala is highly specialised and relies on species of the <i>Eucalyptus</i>, <i>Corymbia</i> and <i>Angophora</i> genus'. While the Koala may use more than 400 species of tree for their food and habitat requirements, preferred tree species will vary by habitat type and location across their range, with primary food species varying in different habitats and potentially comprising as few as two species in any given location (DAWE 2022i). Refuge habitat: Areas where microclimates provide refuge from heat, and perennial water results in leaf-water content remaining high, e.g. deep gullies, caves, cliffs or dense vegetation (DAWE 2022i). Climate refugia for this species includes drainage lines, riparian zones and patches that are resilient to drying conditions due to favourable hydrological systems (DAWE 2022i). Nearest Record: This species was recorded along the Woolgar River, immediately north and north-west of the project site during the field surveys.	
Large-eared Horseshoe Bat (<i>Rhinolophus robertsi</i>)	Endangered	Vulnerable	PMST	Distribution: The Large-eared Horseshoe Bat occurs only in northern Queensland, from the Iron Range southwards to Townsville and west to the karst regions of Chillagoe and Mitchell-Palmer. The southern limit of its range has not been clarified, and it might be present south of Townsville at Mt Elliott and Cape Cleveland. The most southern	Low: The project site lacks rainforest or gallery forest lined waterways and it is not known from the gulf region.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				record of the species occurred at the Paluma mine (c. 80 km north of Townsville) until it was closed in 1994. In addition, records south of Cooktown have become rare, though there are occasional captures, such as the two records within 50 km of Townsville (DAWE 2022j). General habitat preferences: The Greater Large-eared Horseshoe Bat is found in lowland rainforest, along gallery forest-lined creeks within open eucalypt forest, <i>Melaleuca</i> spp. forest with rainforest understorey, open savannah woodland and tall riparian woodland of <i>Melaleuca</i>, Forest Red Gum (<i>Eucalyptus tereticornis</i>) and Moreton Bay Ash (<i>E. tessellaris</i>) (DAWE 2022j). Roosting habitat: Daytime roosting habitat for the Greater Large-eared Horseshoe Bat includes caves and underground mines located in rainforest, and open eucalypt forest and woodland. Roosts have also been observed in road culverts, and it is suspected that the species uses basal hollows of large trees, dense vegetation, rock piles and areas beneath creek banks (DAWE 2022j). Foraging habitat: At night, they forage mainly in open forest and wattle-dominated ridges in rainforest. In open forest and woodland, they prefer to forage amongst the thicker vegetation in gullies and along creeks, though they have been observed at the edge of grassy clearings in rainforest and road edges (Churchill 2009; DAWE 2022j). They	This species was not recorded from the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				usually fly within the lower half of the canopy between one and eight metres, using gaps such as tracks within rainforest (Churchill 2009) The species has also been observed regularly at canopy height (around 25 m). The species feeds mainly on moths, beetles, grasshoppers and crickets to a lesser extent (DAWE 2022j). Breeding habitat: It is known to roost in caves and underground mines located in rainforest, and open eucalypt forest and woodland, as well as road culverts and possibly basal hollows of large trees, dense vegetation, rock piles and areas beneath creek banks. It is thought that breeding females prefer roost habitat with warm and very humid conditions even when ambient conditions may not be. Breeding is thought to occur in October and November (DAWE 2022j). Nearest Record: This species has not been recorded within 50 km of the project site. Published records of this species are located along the north-east Queensland coast, with the nearest record more than 450 km north-east of the project site near Rossville (DAWE 2022j).	
Short-beaked Echidna (<i>Tachyglossus aculeatus</i>)	Special Least Concern	Not listed	Wildlife Online	Distribution: This species occurs throughout mainland Australia and Tasmania, as well as King, Flinders and Kangaroo Islands (Menkhurst & Knight 2011).	Present: This species was recorded in the project site during the seasonal fauna surveys (Figure 9). This species occurs in a wide range of habitat including

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				General habitat preferences: This species occurs in almost all terrestrial habitats except intensively managed farmland. It shelters in logs, crevices, burrows or piles of litter and feeds on ants, termites and other soil invertebrates, particularly beetle larvae (Menkhorst and Knight 2011). Nearest Record: This species was recorded in the project site during the seasonal surveys.	grazing land and is likely to occur throughout the project site.
Reptiles					
Plains Death Adder (<i>Acanthophis hawkei</i>)	Vulnerable	Vulnerable	PMST	Distribution: The distribution of this species is unclear, but it is thought to occur in western Queensland, across the north of the Northern Territory to north-east Western Australia. It is known to occur in the Mitchell Grass Downs of western Queensland, the Barkly Tableland on the Northern Territory/Queensland border and east of Darwin in the Northern Territory (TSSC 2011). General habitat preferences: This species is known to occur on flat, treeless, cracking-soil riverine floodplains of northern Australia. It is thought to be a nomadic species and may travel distances of up to 1 km a day (TSSC 2011). Nearest Record: This species has not been recorded within 50 km of the project site. The nearest published record of this species is more than 550 km west of the project site in the Northern Territory (CSIRO 2022).	Low: The project site lacks cracking clay floodplains. This species was not recorded from the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
Yakka Skink (<i>Egernia rugosa</i>)	Vulnerable	Vulnerable	PMST	Distribution: The distribution of this species is highly fragmented. It extends from the coast to the hinterland of sub-humid to semi-arid eastern Queensland. It has been recorded between the Queensland/New South Wales border to Oyala Thumotang National Park on Cape York Peninsula, and from Bundaberg and the region west of Gympie to Mariala National Park west of Charleville (DAWE 2022k). General habitat preferences: This species occurs in woodland and open forest habitats, wet/dry sclerophyll forest and ecotonal rainforest habitats. This species is commonly found in cavities under and between partly buried rocks, logs or tree stumps, root cavities and abandoned animal burrows. The species often takes refuge in large hollow logs and has been known to excavate deep burrow systems, sometimes under dense ground vegetation (Cogger 2000; Wilson 2005). In cleared habitat, this species can persist where there are shelter sites such as raked log piles, deep gullies, tunnel erosion/sinkholes and rabbit warrens. The species has also been found sheltering under sheds and loading ramps. This species is not generally found in trees or rocky habitats (Chapple 2003). The species occurs in a range of land zones within Queensland, including land zones 3, 4, 5, 7, 9 and 10, although land zone 8 is not thought to be representative core habitat for the species.	Low: The project site is towards the north-western extent of the species' known distribution. Although the sandstone escarpments potentially provide rock cavities for this species to shelter, the species generally does not use 'rocky' habitats and these escarpments and other habitats in the project site were found to generally lack sufficient cover such as rock cavities and fallen timber. No potential burrows or possible defecation sites were detected during field surveys. This species was not recorded from the project site during the seasonal fauna surveys.

Species	NC Act Status	EPBC Act Status	Source ¹	Preferred Habitat	Likelihood to occur in the project site
				Common vegetation types in which the species occurs includes; Brigalow (<i>Acacia harpophylla</i>), Mulga (<i>A. aneura</i>), Bendee (<i>A. catenulata</i>), Lancewood (<i>A. shirleyi</i>), Belah (<i>Casuarina cristata</i>), Poplar Box (<i>Eucalyptus populnea</i>), Ironbark (<i>Eucalyptus</i> spp.) and White Cypress Pine (<i>Callitris glaucophylla</i>) (DAWE 2022k). Feeding habitat: This species burrows and feeds on soft plant material and fruits as well as a variety of invertebrates that venture into or near the burrow entrance. This species defecates in a pile outside burrow entrances (DAWE 2022k). Nearest Record: There are no records of this species within 50 km of the project site. The nearest published record of this species is adjacent to Dulthara Road in Blackbraes National Park approximately 70 km north-east east of the project site (CSIRO 2019).	

¹ PMST – EPBC Act Protected Matters Search Tool
 ALA – Atlas of Living Australia database

Appendix E

Flora identified in the project site

Table E1: Flora identified in the project site during seasonal surveys

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Abutilon fraseri</i>	ncn	C		1	1			1																						
<i>Abutilon macrum</i>	ncn	C		+	1 (t)			1				1			+										1	1				2
<i>Abutilon otocarpum</i>	Flannel Weed	C			+	1									1														1 (tk)	1
<i>Acacia elachantha</i>	ncn	C	4	3-5	3-4	2	4	3	2		3	1	4-5	4-5	4	5	5	2	5				1	1	1				1	
<i>Acacia galioides</i>	ncn	C																						1-3^						
<i>Acacia gonoclada</i>	ncn	C																						1^						
<i>Acacia hammondii</i>	Hammond's Wattle	C																											1	
<i>Acacia hemsleyi</i>	ncn	C						+ -2 (t)																						
<i>Acacia holosericea</i>	Velvet Wattle	C	2	3	+		1	2																						
<i>Acacia julifera subsp. gilbertensis</i>	ncn	C					+												+			1 (t)								
<i>Acacia lazaridis</i>	ncn	C																			2	1				1				
<i>Acacia melleodora</i>	ncn	C		+			2											1		4-5					1	4	2	4		
<i>Acacia multisiliqua</i>	ncn	C	1-2																		4	4-5	1						1 (g)	
<i>Acacia platycarpa</i>	White-barked Wattle	C											+																	
<i>Acanthospermum hispidum</i>	Star Burr	*	+	2	1	2	2	2																						1 (p)
<i>Achyranthes aspera</i>	Chaff Flower	C			1	1						1	1		1			+	(t)							1				1
<i>Aeschynomene indica</i>	Buddha Pea	C	1				+	(t)																						
<i>Afrohybanthus aurantiacus</i>	ncn	C																				1 (t)								
<i>Afrohybanthus enneaspermus</i>	Purple Spade Flower	C		+				1				1			2									1	2	2	2			
<i>Afrohybanthus stellarioides</i>	Orange Spade Flower	C		+												1														
<i>Alectryon oleifolius subsp. elongatus</i>	Western Rosewood	C		+	(t)																									

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Alloteropsis cimicina</i>	Small Cockatoo Grass	C	3	2-3	2				2																					2
<i>Alphitonia excelsa</i>	Red Ash	C		1				2								3-4	2	3	4											
<i>Alphitonia pomaderroides</i>	ncn	C														3														
<i>Alternanthera denticulata</i>	Lesser Joyweed	C	1	+		+																					1			1
<i>Alternanthera pungens</i>	Khaki Weed	*			+-1 (t)	+																								
<i>Ammannia multiflora</i>	Jerry-jerry	C	1				+	1 (bk)																			2 (t)			
<i>Amyema bifurcata</i>	Bloodwood Mistletoe	C																	+	(t)										
<i>Amyema miquelii</i>	Bronze Mistletoe	C																												1
<i>Antidesma parvifolium</i>	Currant Bush	C								1											1 (t)									
<i>Aphyllodium biarticulatum</i>	ncn	C	2	2 (t)			2	1							2															
<i>Aristida calycina</i> var. <i>calycina</i>	Dark Wiregrass	C		1																									1	
<i>Aristida holathera</i> var. <i>holathera</i>	Erect Kerosene Grass	C	3			1	2-3		2					+					2					1-4	2	3	2-3		2-4	2
<i>Aristida hygrometrica</i>	Northern Kerosene Grass	C	3	2	1	2	2-4	2	2			2	4		3	4	3	5	3-5								1 (t)			
<i>Aristida inaequiglumis</i>	Feathertop Three-awn	C										1																		
<i>Aristida ingrata</i>	ncn	C		1	2	2	2			+	3	3	2-3		3	3	3	3-4	4								2			
<i>Aristida lazaridis</i>	ncn	C						+												2				2	2					
<i>Aristida pruinosa</i>	Gulf Wiregrass	C	4	1	3	4						2	1							1				1	2	2	2		2	3
<i>Aristida sciuroides</i>	ncn	C	+-2							1		2		+																
<i>Aristolochia pubera</i> var. <i>pubera</i>	ncn	C								+																				
<i>Arundinella nepalensis</i>	Reed Grass	C						4-5 (bk)		2	1																			

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Astrotricha pterocarpa</i>	ncn	C																			1 (t)									
<i>Atalaya hemiglauc</i>	Whitewood	C		1 (t)	2 (t)	1						+													+	(t)				
<i>Bidens bipinnata</i>	Cobbler's Pegs	*				1	1		+																					1 (p)
<i>Blumea saxatilis</i>	ncn	C	2				2																							
<i>Boerhavia pubescens</i>	ncn	C	2									1	1							+	(g)						1			
<i>Bonamia media</i>	ncn	C	1	1 (t)	1	2	2	1	2	+	1	1	2	1 (t)	1 (t)				2				1		2	1	2			2
<i>Bonamia pannosa</i>	ncn	C													2		1					3								
<i>Boronia bowmanii</i>	ncn	C																			+-2									
<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>	Forest Bluegrass	C	3	2-3				3 (bk)		2																+				
<i>Bothriochloa decipiens</i> var. <i>cloncurrensis</i>	ncn	C		2-3	3	1	1- (3)					1													2	1	1 (t)			1
<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	Pitted Bluegrass	C																						1						
<i>Bothriochloa ewartiana</i>	Desert Bluegrass	C								1																				
<i>Bothriochloa pertusa</i>	Indian Bluegrass	*							2																					
<i>Brachyachne convergens</i>	Native Couch	C		1				1-3	1 (t)																		1`			1
<i>Brachychiton paradoxus</i>	Red-flowered Kurrajong	SL										+		2			1 (t)													
<i>Breynia oblongifolia</i>	Coffee Bush	C		1 (t)						1															1 (t)					
<i>Buchanania obovata</i>	Green Plum	C																				1 (t)								
<i>Buchnera linearis</i>	Blackrod	C					1																							
<i>Bulbine bulbosa</i>	Native Leek	C									1																			
<i>Bulbostylis barbata</i>	ncn	C	1 (t)	1		2									2					1 (t)							1		2	
<i>Cajanus acutifolius</i>	ncn	C											+				1 (t)		2	+	(g)			4						

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Cajanus scarabaeoides</i> var. <i>scarabaeoides</i>	ncn	C										1	+																	
<i>Calandrinia arenicola</i>	ncn	C	+	1																										
<i>Calandrinia balonensis</i>	ncn	C																								1 (t)	2			1
<i>Calytrix leptophylla</i>	ncn	C										+	(t)				1	(t)												
<i>Capparis canescens</i>	Wild Orange	C				1	(t)																							
<i>Capparis lasiantha</i>	Nipan	C		1 (t)								1												+						
<i>Carissa lanceolata</i>	Konkerberry	C		2-3	3						1	3	2-3		2	2									3-4	3-	(4)			
<i>Cartonema brachyantherum</i>	ncn	C					1																							
<i>Cassytha capillaris</i>	ncn	C																						1						
<i>Cassytha filiformis</i>	Dodder Laurel	C																		1										
<i>Cenchrus ciliaris</i>	Buffel Grass	*							+ -2	1																				
<i>Chamaecrista absus</i>	ncn	C			+		+																						1	2
<i>Chamaecrista symonii</i>	ncn	C													2	1		2		1 (t)										
<i>Cheilanthes distans</i>	Rock Felt Fern	C																		1 (t)	1	+					1			
<i>Dysphania carinata</i>	Green Crumbweed	C																		+ -2 (t)							+			
<i>Chloris inflata</i>	Purple-top Chloris	*						2																						
<i>Chloris lobata</i>	Lobed Chloris	C	2	2																										
<i>Chloris pumilio</i>	ncn	C	2				+	(t)																			1	(t)		
<i>Chloris virgata</i>	Feathertop Rhodes Grass	*	2																											
<i>Chrysopogon fallax</i>	Golden Beard Grass	C	2-3		2	2	1-4					1												1	2	1				4
<i>Chrysopogon pallidus</i>	ncn	C																1												

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Citrullus colocynthis</i>	ncn	*						1																						
<i>Cleome viscosa</i>	Sticky Cleome	C				1						+											1			+ (t)	1			1
<i>Clerodendrum floribundum</i>	Lolly Bush	C											+			2	1		1											
<i>Clitoria ternatea</i>	Butterfly Pea	*							2	2-3	1																			
<i>Commelina diffusa</i>	Native Wandering Jew	C										1	+			1		+	(t)											
<i>Corchorus aestuans</i>	ncn	C		1																										
<i>Corchorus sericeus subsp. densiflorus</i>	Grey Jute	C			+							1	1		1		2		1	+	(g)			1	1	2	3	1	+	
<i>Corchorus sidoides subsp. vermicularis</i>	Flannel Jute	C																				2	1							
<i>Corchorus trilocularis</i>	Native Jute	C	2		2			2	1 (t)	1				2																
<i>Corymbia confertiflora</i>	Northern Carbeen	C						3											1											
<i>Corymbia polycarpa</i>	Long-fruited Bloodwood	C	2				4			4				2 (t)	4	4-5			4-5											
<i>Corymbia serendipita</i>	Newcastle Range Bloodwood	C																			5	5	6							
<i>Corymbia setosa</i>	Rough-leaved Bloodwod	C												5		3	3	4-5												
<i>Corymbia terminalis</i>	Inland Bloodwood	C																				1 (t)	+				1 (t)			
<i>Crinum flaccidum</i>	River Lily	SL		+																										
<i>Crotalaria aridicola subsp. aridicola</i>	ncn	C			2							2	2	2	2	1 (t)	2		1								1			
<i>Crotalaria medicaginea</i> var. <i>linearis</i>	Trefoil Rattlepod	C													1			2	1											
<i>Crotalaria medicaginea</i> var. <i>medicaginea</i>	Trefoil Rattlepod	C	2		1	1	1	1				1	2												1	+	+			
<i>Crotalaria medicaginea</i> var. <i>neglecta</i>	Trefoil Rattlepod	C	1 (t)	1								+	(t)	2	1	2	2													

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Crotalaria montana</i> var. <i>exserta</i>	<i>ncn</i>	C	1	+	1		1		+																+					
<i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i>	New Holland Rattlepod	C						+	(t)																					
<i>Cryptostegia grandiflora</i>	Rubber Vine	* (RI)			+		+	3-4	4-5		3																			
<i>Cyanthillium cinereum</i>	<i>ncn</i>	C					+	+																						
<i>Cymbidium canaliculatum</i>	Black Orchid	SL				1 (t)																								
<i>Cymbopogon bombycinus</i>	Silky Oilgrass	C																						+2	2					
<i>Cymbopogon obtectus</i>	<i>ncn</i>	C																		2				+				1		1
<i>Cynodon dactylon</i>	Green Couch	*	1	1	+			1 (bk)	2																					
<i>Cyperus compressus</i>	<i>ncn</i>	*	1	+																										
<i>Cyperus cristulatus</i>	<i>ncn</i>	C	1																											
<i>Cyperus difformis</i>	Dirty Dora	C							3-4 (d)																					
<i>Cyperus exaltatus</i>	Tall Sedge	C							1 (d)																					
<i>Cyperus iria</i>	<i>ncn</i>	C	2																											
<i>Cyperus macrostachyos</i>	<i>ncn</i>	C	1				+		1	1																				
<i>Cyperus squarrosus</i>	<i>ncn</i>	C	2																				1		1		1			1
<i>Dactyloctenium aegyptium</i>	<i>ncn</i>	*	2	+				1																						
<i>Dactyloctenium radulans</i>	Button Grass	C	2					2		+		1	2														+			
<i>Damasonium minus</i>	Star Fruit	SL																									+	(d,t)		
<i>Decaisnina brittenii</i> subsp. <i>brittenii</i>	<i>ncn</i>	C								1	2																			
<i>Dendrophthoe glabrescens</i>	Orange Mistletoe	C		1 (t)						1	2																			

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Denhamia cunninghamii</i>	Yellowberry	C		1		2	1										+	1						+2	3	3	2			2
<i>Desmodium muelleri</i>	ncn	C		2		2	2				1		1		1		+		1								+			
<i>Dichanthium fecundum</i>	ncn	C						3-4 (bk)	1																					
<i>Digitaria breviglumis</i>	ncn	C					1					+													1	+				
<i>Digitaria brownii</i>	Cotton Panic Grass	C		+			+								1															
<i>Digitaria ciliaris</i>	Summer Grass	*		1-2				1	1	1																				
<i>Digitaria divaricatissima</i> var. <i>divaricatissima</i>	Umbrella Finger Grass	C									1																			
<i>Digitaria eriantha</i>	Blue Digit	*																									1 (tk)			
<i>Dimeria ornithopoda</i>	ncn	C			2	1	2																							
<i>Diospyros humilis</i>	Small-leaved Ebony	C						2																						
<i>Diplatia grandibractea</i>	Coolabah Mistletoe	C	1																									1 (t)		
<i>Dodonaea filifolia</i>	ncn	C												1		+	(t)				2									
<i>Dodonaea hispidula</i> var. <i>hispidula</i>	ncn	C					+											1	1			+								
<i>Dodonaea physocarpa</i>	ncn	C		+	3							1												+5	5	5	5-6		+	1
<i>Dolichandrone alternifolia</i>	ncn	C			1		+					1 (t)			1 (t)				2						2	1	+	(t)		
<i>Echinochloa colona</i>	Awnless Barnyard Grass	*	1				1	2 (bk)																						
<i>Ectrosia gulliveri</i>	ncn	C	1																											
<i>Ectrosia leporina</i>	ncn	C					3																							
<i>Ectrosia schultzii</i> var. <i>schultzii</i>	ncn	C			1 (t)																									
<i>Ehretia saligna</i>	ncn	C											1											1	2					

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Eleocharis sp.(n-r)</i>	ncn	C																						2	3-5 (d)					
<i>Elionurus citreus</i>	ncn	C					1																							
<i>Emilia sonchifolia</i>	Emilia	*					1																							
<i>Enneapogon lindleyanus</i>	Cone-top Nine-awn	C	1	1	2							2								+ (g)				1	2	2	1			2
<i>Enneapogon pallidus</i>	ncn	C			2	2							1				1 (t)		+							1	1			3
<i>Enneapogon robustissimus</i>	ncn	C										2	1			1 (t)	1 (t)	1 (t)								+				
<i>Enteropogon ramosus</i>	Curly Windmill Grass	C			1							+ (t)																		
<i>Eragrostis cumingii</i>	ncn	C		1		2	2			1		2																	1 (tk)	
<i>Eragrostis elongata</i>	Clustered Lovegrass	C	+																											
<i>Eragrostis exigua</i>	ncn	C				1																							1	1
<i>Eragrostis fallax</i>	ncn	C		2				3 (bk)	2 (t)																				1 (tk)	
<i>Eragrostis pubescens</i>	ncn	C		1			2																							
<i>Eragrostis schultzei</i>	ncn	C	1																											
<i>Eragrostis setifolia</i>	ncn	C										+																		
<i>Eragrostis tenellula</i>	ncn	C										1													1					
<i>Eremophila bignoniiflora</i>	Creek Wilga	C		1-2 (t)	+ -2																									
<i>Eremophila mitchellii</i>	False Sandalwood	C																								+				
<i>Eriachne ciliata</i>	ncn	C														1 (t)														
<i>Eriachne mucronata</i>	Wanderrie Grass	C														1		1												
<i>Eriachne obtusa</i>	ncn	C			+	1						2	2			1			+	1				2	2	4	4		1-3	3-4
<i>Eriachne sp. (Dugald River B.K.Simon+ 3007)</i>	ncn	C																		+ -3 (e,t)		1	2				3	2	3	

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Eriachne triodioides</i>	ncn	C																2												
<i>Erythrophleum chlorostachys</i>	Cooktown Ironwood	C			+ -1		2					2	3-4	3-4	4-5	4	4	4-5	4	1	+		+	+ -2	+	+				
<i>Erythroxylum australe</i>	Cocaine Bush	C																							2					
<i>Erythroxylum ellipticum</i>	Cocaine Bush	C		+									2			1							1							
<i>Eucalyptus camaldulensis subsp. obtusa</i>	River Red Gum	C	3-5	4		2	4-5	4	5	4	4																			
<i>Eucalyptus leptophleba</i>	Molly Red Box	C		3-4	3-4	1				2 (e)																				
<i>Eucalyptus microneura</i>	Gilbert River Box	C	3-5	1-4	4-5	5	4-5					6	5	1 (t)			1	1		6				6	5-6	6	6	6	6	6
<i>Eucalyptus miniata</i>	Darwin Woollybutt	C												1 (t)	4- (5)	4			4- 5		4	4	1							
<i>Euphorbia dallachyana</i>	ncn	C							1				+	1 (t)																
<i>Euphorbia drummondii</i>	Caustic Weed	C								1	1				1	1 (t)	2													
<i>Euphorbia hirta</i>	Asthma Plant	*		+	+			1																						
<i>Euphorbia mitchelliana</i> var. <i>mitcheiliana</i>	ncn	C		2	1		+		2			1	2		4-5	2	+		1			+	1	+	1	1	1			
<i>Euphorbia tannensis</i> subsp. <i>eremophila</i>	Desert Spurge	C			+ -3 (t)																									
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	Creeping Speedwell	C			2								2		+		1	2	2				2			2	1		2	2
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	Creeping Speedwell	C													1 (t)						+			1				+		
<i>Ficus opposita</i>	Deciduous Fig	C						+ -2																						
<i>Fimbristylis bisumbellata</i>	ncn	C	1				2																				1			
<i>Fimbristylis pauciflora</i>	ncn	C	2		1	1																								
<i>Flueggea virosa</i>	Currant Bush	C			+	(t)		+				1 (t)														+	(t)			2
<i>Fuirena arenosa</i>	ncn	C	2-3				+																							

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<i>Galactia tenuiflora</i> var. <i>lucida</i>	<i>ncn</i>	C		2	2	1		1					1											1	2					2
<i>Gardenia vilhelmii</i>	<i>ncn</i>	C																		1^										
<i>Geijera salicifolia</i>	Broad-leaved Wilga	C		1 (t)								1																		
<i>Glycine</i> sp. (<i>n-r</i>)	<i>ncn</i>	C										+																		
<i>Glycine syndetika</i>	<i>ncn</i>	C		2		1												1							2		1			
<i>Glycine tomentella</i>	Woolly Glycine	C		+			2	1	1																					
<i>Gomphrena flaccida</i>	<i>ncn</i>	C	+			1														1 (t)			1	1		+	2			1
<i>Gomphrena humilis</i>	<i>ncn</i>	C																					1							
<i>Gomphrena lanata</i>	<i>ncn</i>	C																						+			1			
<i>Goodenia armitiana</i>	Fine Goodenia	C																					1 (t)							
<i>Goodenia fascicularis</i>	<i>ncn</i>	C	1																											
<i>Gossypium australe</i>	Native Cotton	C										1 (t)							3						1 (t)					
<i>Grevillea decora</i>	<i>ncn</i>	C		1 (t)	+		+														3	4								
<i>Grevillea glauca</i>	Bushman's Pegs	C																					1 (t)							
<i>Grevillea pteridifolia</i>	Golden Parrot Tree	C																					1							
<i>Grewia latifolia</i>	Dog's Balls	C		2	1			1					2			1	1	1	1					+						
<i>Grewia retusifolia</i>	Dysentary Bush	C								1																				
<i>Hakea chordophylla</i>	Bootace Oak	C			+								+												1 (t)					
<i>Heliotropium consimile</i>	<i>ncn</i>	C					+																	1						
<i>Heliotropium cunninghamii</i>	<i>ncn</i>	C			1		1					1						2	1							1				
<i>Heliotropium tanythrix</i>	<i>ncn</i>	C													1															
<i>Heteropogon contortus</i>	Black Speargrass	C	2	2	3	1		2	2	1		2	3			3	3-4	3	3	2				+	1	2	1			

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Hibiscus meraukensis</i>	Merauke Hibiscus	C		+										1	1		2	1												
<i>Hibiscus setulosus</i>	ncn	C																				1 (t)						1 (t)		
<i>Hovea parvicalyx</i>	ncn	C																				1 (t)								
<i>Indigofera brevidens</i>	ncn	C										1																		
<i>Indigofera colutea</i>	Sticky Indigo	C	2	1	+	1		1				1	1		1				+						2	1			+	
<i>Indigofera ewartiana</i>	ncn	C	1	1																										
<i>Indigofera hirsuta</i>	Hairy Indigo	C																								+			1	1
<i>Indigofera linifolia</i>	Narrow-leaved Indigo	C										+	2					1	+	+					1 (t)	+				
<i>Indigofera linnaei</i>	Birdsville Indigo	C		1	2	1			2			3-4	2		+															
<i>Indigofera pratensis</i>	ncn	C													1								3	+ -1	2					
<i>Indigofera trita</i>	Pale Indigo	C		1 (t)																								+		
<i>Ipomoea abrupta</i>	ncn	C																				+	+							
<i>Ipomoea plebeia</i>	Bell Vine	C		+				2																						
<i>Ipomoea polymorpha</i>	ncn	C					2			1	1				2		1	1												
<i>Jacksonia odontoclada</i>	ncn	C																				2 (t)								
<i>Jacksonia ramosissima</i>	ncn	C																											1	
<i>Jacquemontia paniculata</i> var. <i>tomentosa</i>	ncn	C																							+		+			
<i>Jasminum didymum</i> subsp. <i>lineare</i>	ncn	C						1				+																		
<i>Leptosema oxylobioides</i>	ncn	C																				1								
<i>Lithomyrtus retusa</i>	ncn	C																					1 (t)							
<i>Ludwigia octovalvis</i>	Native Willow Primrose	C					1 (t)	2 (bk)																						

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<i>Ludwigia perennis</i>	<i>ncn</i>	C	2				1																							
<i>Lysiana spathulata</i> subsp. <i>spathulata</i>	Spoon-leaved Mistletoe	C		1 (t)																										1
<i>Lysiphyllum cunninghamii</i>	Kimberley Bauhinia	C	2	3	4			3-4		2		4-5	2-3						2						2	2				
<i>Malvastrum americanum</i> var. <i>americanum</i>	Spiked Malvastrum	*		2								1																		
<i>Marsdenia australis</i>	Native Pear	C		1				1					1		1	2	1							1						
<i>Melaleuca bracteata</i>	Black Tea Tree	C						1 (bk)																						
<i>Melaleuca fluviatilis</i>	Weeping Tea Tree	C		4-5				2	5	4	6																			
<i>Melaleuca leucadendra</i>	Weeping Paperbark	C						5		3-4	1																			
<i>Melaleuca nervosa</i>	Yellow Paperbark	C	2																											
<i>Melaleuca stenostachya</i>	<i>ncn</i>	C				+	2																	1-5						
<i>Melhania brachycarpa</i>	<i>ncn</i>	C										1																		
<i>Melhania oblongifolia</i>	Melhania	C		1	2							1	1		1		1								2	1	+			
<i>Melinis repens</i>	Red Natal Grass	*	3					1 (t)		2	4																			
<i>Microstachys chamaelea</i>	<i>ncn</i>	C			1 (t)																									
<i>Mnesithea formosa</i>	<i>ncn</i>	C			+ -2											1	3			2 (t)					+	2	3		2	2
<i>Mucuna gigantea</i>	Burny Bean	C									2																			
<i>Murdannia graminea</i>	Slug Herb	C	+																											
<i>Myriophyllum verrucosum</i>	<i>ncn</i>	C																								3 (d,t)				
<i>Oldenlandia mitrasacmoides</i> subsp. <i>trachymenoides</i>	<i>ncn</i>	C	2			1	2																							

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<i>Pandanus spiralis</i>	Scew Pine	C	1 (t)	+2 (t)																										
<i>Pandorea pandorana</i>	Wonga Vine	C																	+											
<i>Panicum effusum</i>	Hairy Panic	C		1 (t)											1									1	1	1	1			
<i>Panicum seminudum</i> var. <i>seminudum</i>	<i>ncn</i>	C	1	1				2	2	1	2				1	1 (t)	4		1	+	(g)						1			2
<i>Parkinsonia aculeata</i>	Parkinsonia	* (RI)						1^																						
<i>Parsonsia lanceolata</i>	Rough Silkpod	C																	+											
<i>Paspalidium rarum</i>	<i>ncn</i>	C	2	1			1																							
<i>Passiflora foetida</i>	Stinking Passionfruit	*		+	1			2	+																					
<i>Peripleura hispidula</i> var. <i>hispidula</i>	<i>ncn</i>	C			1																			+	1					
<i>Perotis rara</i>	Comet Grass	C	2-3	1	3	3-4	1-4	4		+		1	2	2-3	+-2		+										1 (t)			
<i>Persoonia falcata</i>	Wild Pear	C																												
<i>Petalostigma banksii</i>	Quinine Bush	C												3-4	3	4	4	4	4	2 (e) (t)	+-3	2 ⁻ (3)	2							
<i>Phyllanthus carpentariae</i>	<i>ncn</i>	C	+		1									+	2			+	(t)									1	2	1
<i>Phyllanthus collinus</i>	<i>ncn</i>	C			1		1					1	1				1	2	1				2							
<i>Phyllanthus sulcatus</i>	Hen and Chicken	C											+	2	2	+														
<i>Phyllanthus virgatus</i>	<i>ncn</i>	C			1				1											2				1	1	2	2			
<i>Planchonia careya</i>	Cocky Apple	C																1					1							
<i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>	<i>ncn</i>	C				2	1				1				2		1		1	1			1				1		2	2
<i>Polygala crassitesta</i>	<i>ncn</i>	C	1 (t)	1			+					1	1		1			2	2			+-2 (t)			1					
<i>Polymeria ambigua</i>	Creeping Polymeria	C	2	1			+	1	1					2	1		1													

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<i>Polymeria lanata</i>	ncn	C											+																	
<i>Polymeria marginata</i>	ncn	C	+					1																						
<i>Portulaca bicolor</i>	ncn	C		1			1 (t)					1		1 (t)		1							1		1	2	2			
<i>Portulaca filifolia</i>	Native Pigweed	C			+	1		+				1			+			1								+	1			1
<i>Portulaca oleracea</i>	Pigweed	*						+																						
<i>Portulaca pilosa</i>	Hairy Pigweed	*	+					+																						
<i>Psydrax saligna</i> <i>forma saligna</i>	ncn	C										+					+													
<i>Pterocaulon ciliosum</i>	ncn	C										1	+												+					
<i>Ptilotus fusiformis</i>	ncn	C													2															
<i>Rhynchosia minima</i> var. <i>australis</i>	Rhyncho	C		1								+	1														1 (t)			
<i>Rostellularia adscendens</i>	Pink Tongues	C					+													1 (g)				2	2	1	+			1
<i>Salsola australis</i>	Soft Roly Poly	C																											1 tk)	
<i>Sarga plumosum</i>	Plume Sorghum	C				2	+	2	1	3																			1	1
<i>Sauropus elachophyllus</i>	ncn	C																												
<i>Schizachyrium fragile</i>	ncn	C	2-3		2		2		2			1	2		2	2	4	3	3-5	+ -2 (t)					3	1			3	
<i>Schizachyrium perplexum</i>	ncn	C																									2			2
<i>Scleria mackaviensis</i>	ncn	C																		2 (g)										
<i>Scoparia dulcis</i>	Scoparia	*					1 (t)																							
<i>Sehima nervosum</i>	ncn	C					+													+ -3 (g)										
<i>Senna costata</i>	ncn	C			1 (t)																									
<i>Setaria surgens</i>	(a) Pigeon Grass	C	2	1	+		2	1	1	1			+		1			3	1											
<i>Sida acuta</i>	Wireweed	*																							1 (t)					

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Sida atherophora</i>	ncn	C				1	+																							
<i>Sida brachypoda</i>	ncn	C			+2 (t)							1													2	3	1			
<i>Sida cordifolia</i>	Flannel Weed	*	1	2	2	2	1	2-3	2	+	1		+		1									1			1			1
<i>Sida</i> sp. (Musselbrook M.B.Thomas+ MRS437)	ncn	C			1																									
<i>Sida hackettiana</i>	Shrub Sida	C				1																					1			1
<i>Sida rohlenae</i>	ncn	C		1	1			2				1			1															
<i>Sida spinosa</i>	Spiny Sida	*		1	1			1																						1
<i>Solanum crebrispinum</i>	ncn	C																		+- (2) (g)									1	
<i>Spermacoce stenophylla</i>	ncn	C					1					1											1		+					1
<i>Sporobolus actinocladus</i>	Katoora Grass	C		+3 (t)																										
<i>Sporobolus australasicus</i>	ncn	C							1			1													1	2	+		1-2	2
<i>Stylosanthes hamata</i>	Stylo	*	3	+	2	1	+	2																	1		2		+	2
<i>Stylosanthes humilis</i>	ncn	*							2			1														1				
<i>Stylosanthes scabra</i>	Shrubby Stylo	*					1	1				+											+		+	1	2	+	+	1
<i>Synostemon rhytidospermus</i>	ncn	C										1 (t)							2											
<i>Syzygium eucalyptoides</i>	ncn	C							1																					
<i>Tephrosia astragaloides</i>	ncn	C		1 (t)																				2	+					
<i>Tephrosia brachyodon</i> var. <i>longifolia</i>	Narrow-leaved Indigo	C															2													
<i>Tephrosia filipes</i>	ncn	C													2					+	(g)						2	2		
<i>Tephrosia juncea</i>	ncn	C										1													2					
<i>Tephrosia leptoclada</i>	Slender Tephrosia	C																	1						1	1	1		2	
<i>Tephrosia rosea</i> var. <i>rosea</i>	Flinders River Poison	C													1			2											1	

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Tephrosia</i> sp. (Magazine Hill P.Jones 365)	ncn	C													1												2			
<i>Tephrosia supina</i>	Soft Tephrosia	C													2								2							
<i>Tephrosia virens</i>	Green Tephrosia	C														1 (t)					2	+						1		
<i>Terminalia aridicola</i> subsp. aridicola	Arid Peach	C		1	1	2	1				+		1			3-4				2			+		2	+	4			4
<i>Thaumastochloa pubescens</i>	ncn	C	2	1		1	2-3								2	2	+	2												
<i>Themeda avenacea</i>	Native Oatgrass	C																							1 (t)					
<i>Themeda triandra</i>	Kangaroo Grass	C																		1										
<i>Tinospora smilacina</i>	Tinospora Vine	C		+		1 (t)		+				+																		
<i>Tragus australianus</i>	Burr Grass	C											2																	
<i>Trema tomentosa</i>	Poison Peach	C							1																					
<i>Tribulopsis angustifolia</i>	ncn	C										2		2	2	2														
<i>Tribulus micrococcus</i>	ncn	C	1	1				1				1	1													+	2			
<i>Trichodesma zeylanicum</i>	Camel Bush	C	1 (t)	1																										
<i>Triodia bitextura</i>	Feathertop Spinifex	C																			1^									
<i>Triodia mitchellii</i>	Buck Spinifex	C																		+-5 (e,t)	6	6	2-4					1 (g)		
<i>Triodia pungens</i>	Gummy Spinifex	C								+										6				2-5				6	5	
<i>Tripogon loliiformis</i>	Five Minute Grass	C			+-3							2											2		2	2	+-2	1	3	
<i>Triraphis mollis</i>	ncn	C	1																											
<i>Triumfetta micracantha</i>	ncn	C			1	1	1	2															3							
<i>Uraria lagopodioides</i>	ncn	C																		2 (g)										
<i>Urochloa decumbens</i>	Signal Grass	*							2																					

Botanical Name	Common Name	Status ¹	S13	S19	S45	S19a	S21a	S46	S18	S1a	S16a	S16	S44	S14	S15	S43	S8a	S9a	S10a	S23	S50	S53	S22a	S17	S20	S21	S22	S52	S18a	S20a
<i>Urochloa gilesii</i> var. <i>gilesii</i>	<i>ncn</i>	C						2				1	2		2															
<i>Urochloa holosericea</i> subsp. <i>velutina</i>	<i>ncn</i>	C		3			1	1	1			1	1	3	3										2		3			
<i>Urochloa mosambicensis</i>	Sabi Grass	*																						+						
<i>Urochloa pubigera</i>	<i>ncn</i>	C	2	3									1		2															
<i>Vachellia bidwillii</i>	Corkwood Wattle	C	1		+							1- (+)													+					
<i>Vachellia farnesiana</i>	Prickly Acacia	* (RI)		1	1	+		2 (t)																						
<i>Vachellia sutherlandii</i>	Corkwood Wattle	C			+	2	1					2																		
<i>Ventilago viminalis</i>	Vine Tree	C										1 (t)																		
<i>Vigna radiata</i>	<i>ncn</i>	C							1																					
<i>Vigna vexillata</i> var. <i>youngiana</i>	<i>ncn</i>	C										1	1																	
<i>Viscum articulatum</i>	Jointed Mistletoe	C									+																			
<i>Waltheria indica</i>	<i>ncn</i>	C	1	2	2	2	2	2-3	2	1	2	2	1	2	2		1	2					1	2		2			2	1
<i>Xanthium occidentale</i>	Noogera Burr	*						+																						
<i>Xenostegia tridentata</i>	<i>ncn</i>	C	1	1					+						2	+	1 (t)													
<i>Yakirra pauciflora</i>	<i>ncn</i>	C																		+	(t)	1	2							
<i>Zornia adenophora</i>	<i>ncn</i>	C																+					1						+	
<i>Zornia areolata</i>	<i>ncn</i>	C										1																		
<i>Zornia muriculata</i>	Upright Zornia	C			1							+											2		2		2		1	2
<i>Zornia prostrata</i>	Zornia Vine	C	1	1	1		2	2							2			1	1	1 (t)					2	1				1

¹Status

NC Act: C= Least concern, SL = Special least concern

Biosecurity Act status: RI – restricted invasive

* - Exotic

BK = creek bank; e = dam; e = edge; g = gully; p= drillpad; t = traverse; tk = track

^ Species cannot be attributed to a secondary survey site, but was recorded in the project site

Relative abundance of species was based on the Braun-Blanquet technique cover-abundance scale (Hurst and Allen 2007; Mueller-Dombois and Ellenberg 2003; Whittaker 1975) as follows:

+ = one or two individuals only

1 = sparse, <5

2 = any number, <5%

3 = 5 – 24%
4 = 25 – 49%
5 = 50 – 74%
6 = 75 – 100%.

Appendix F

Fauna identified in the project site

Table F1: Fauna identified in the project site during seasonal surveys (excl. microchiropteran bats) (November 2017) - trap sites, incidental sites and Black-throated Finch sites

Common Name	Scientific Name	Status ¹	Trap Sites				Drive	Incidental	Black-throated Finch Sites			
			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Amphibians												
Broad-palmed Rocket Frog	<i>Litoria latopalmata</i>	LC										
Bumpy Rocket Frog	<i>Litoria inermis</i>	LC										
Cane Toad	<i>Rhinella marina</i>	*			1 (pf) 1 (sp)							
Desert Tree Frog	<i>Litoria rubella</i>	LC										
Eastern Snapping Frog	<i>Cyclorana novaehollandiae</i>	LC										
Green Tree Frog	<i>Litoria caerulea</i>	LC										
Ornate Burrowing Frog	<i>Platyplectrum ornatum</i>	LC		2 1 (sp)	13 (pf) 6 (fu) 3 (sp)							
Stonemason Toadlet	<i>Uperoleia lithomoda</i>	LC		1 2 3 (pf)								
Superb Collard Frog	<i>Cyclorana brevipes</i>	LC										
Birds												
Apostlebird	<i>Struthidea cinerea</i>	LC		x	x	x			x, x	x, x	x	x
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	LC									x, x	
Australian Bustard	<i>Ardeotis australis</i>	LC		x				x				
Australian Magpie	<i>Cracticus tibicen</i>	LC	x	x	x				x, x	x, x	x, x	x
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	LC	(sp)			1 (sp)						
Australian Raven	<i>Corvus coronoides</i>	LC							x	x		
Banded Honeyeater	<i>Cissomela pectoralis</i>	LC										
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	LC										
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	LC	x	x					x, x	x, x	x, x	x

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Common Name	Scientific Name	Status ¹	Trap Sites				Drive	Incidental	Black-throated Finch Sites			
			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Black-faced Woodswallow	<i>Artamus cinereus</i>	LC						x				
Black-fronted Dotterel	<i>Elseyaornis melanops</i>	LC									x	
Black Kite	<i>Milvus migrans</i>	LC								x		
Black-winged Stilt	<i>Himantopus himantopus</i>	LC									x	
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	LC	x	x		x			x, x	x, x	x	x
Blue-winged Kookaburra	<i>Dacelo leachii</i>	LC			x				x	x, x	x, x	
Brolga	<i>Grus rubicunda</i>	LC							x		x, x	
Brown Falcon	<i>Falco berigora</i>	LC				x		x				
Brown Goshawk	<i>Accipiter fasciatus</i>	LC		x					x	x		
Brown Honeyeater	<i>Lichmera indistincta</i>	LC	x						x	x, x	x	x
Budgerigar	<i>Melopsittacus undulatus</i>	LC	x							x	x, x	
Bush Stone-curlew	<i>Burhinus grallarius</i>	LC							x			
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	LC	x	x	x				x	x		
Cicadabird	<i>Coracina tenuirostris</i>	LC	x						x	x		
Cockatiel	<i>Nymphicus hollandicus</i>	LC							x	x	x	x
Collard Sparrowhawk	<i>Accipiter cirrocephalus</i>	LC		x						x		x
Common Bronzewing	<i>Phaps chalcoptera</i>	LC	x					x	x	x	x, x	x
Crested Pigeon	<i>Ocyphaps lophotes</i>	LC			x				x, x		x	x
Diamond Dove	<i>Geopelia cuneata</i>	LC							x	x	x	x
Dollarbird	<i>Eurystomus orientalis</i>	LC		x	x				x	x		
Double-barred Finch	<i>Taeniopygia bichenovii</i>	LC				x			x	x, x	x	x
Eastern Koel	<i>Eudynamys orientalis</i>	LC			x						x	
Emu	<i>Dromaius novaehollandiae</i>	LC								x	x	
Forest Kingfisher	<i>Todiramphus macleayii</i>	LC								x, x		x
Fork-tailed Swift	<i>Apus pacificus</i>	SLC						x				
Freckled Duck	<i>Stictonetta naevosa</i>	LC									x	
Galah	<i>Eolophus roseicapilla</i>	LC		x				x	x, x	x, x	x	x
Golden-headed Cisticola	<i>Cisticola exilis</i>	LC									x	

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Common Name	Scientific Name	Status ¹	Trap Sites				Drive	Incidental	Black-throated Finch Sites			
			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Great Bowerbird	<i>Ptilonorhynchus nuchalis</i>	LC										x
Great Egret	<i>Ardea alba</i>	SLC									x	
Grey Butcherbird	<i>Cracticus torquatus</i>	LC	x	x	x	x			x, x	x	x	x
Grey Fantail	<i>Rhipidura albiscapa</i>	LC							x	x	x	x
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	LC	x							x		
Grey Teal	<i>Anas gracilis</i>	LC									x	
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	LC						x				
Ground Cuckoo-shrike	<i>Coracina maxima</i>	LC										
Jacky Winter	<i>Microeca fascians</i>	LC										
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	LC						x				
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	LC			x					x, x		
Leaden Flycatcher	<i>Myiagra rubecula</i>	LC	x							x		
Little Friarbird	<i>Philemon citreogularis</i>	LC	x	x	x	x			x, x	x	x, x	x
Magpie-lark	<i>Grallina cyanoleuca</i>	LC		x		x			x, x	x, x	x	x
Masked Lapwing	<i>Vanellus</i>									x	x	
Masked Woodswallow	<i>Artamus personatus</i>	LC									x	
Mistletoebird	<i>Dicaeum hirundinaceum</i>	LC				x			x	x, x	x, x	
Nankeen Kestrel	<i>Falco cenchroides</i>	LC										
Noisy Friarbird	<i>Philemon corniculatus</i>	LC	x						x	x		x
Olive-backed Oriole	<i>Oriolus sagittatus</i>	LC		x	x			x	x	x		
Pale-headed Rosella	<i>Platycercus adscitus</i>	LC	x	x	x	x			x, x	x, x	x, x	x
Peaceful Dove	<i>Geopelia striata</i>	LC	x	x	x				x, x	x, x	x	x
Peregrine Falcon	<i>Falco peregrinus</i>	LC										
Pheasant Coucal	<i>Centropus phasianinus</i>	LC	x						x, x		x, x	x
Pied Butcherbird	<i>Cracticus nigrogularis</i>	LC	x	x	x	x			x, x	x, x	x, x	x
Pied Currawong	<i>Strepera graculina</i>	LC										x
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	LC									x	
Plum-headed Finch	<i>Neochmia modesta</i>	LC									x	
Rainbow Bee-eater	<i>Merops ornatus</i>	SLC	x						x, x	x		x

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			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	LC						x	x	x, x		x
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	LC								x		x
Red-kneed Dotterel	<i>Erythronyx cinctus</i>	LC									x	
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii banksii</i>	LC	x	x					x, x	x		
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	LC			x				x	x, x	x	
Rufous Whistler	<i>Pachycephala rufiventris</i>	LC	x							x		
Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>	LC							x	x	x	
Sacred Kingfisher	<i>Todiramphus sanctus</i>	LC	x									
Singing Honeyeater	<i>Lichenostomus virescens</i>	LC								x	x	
Southern Boobook	<i>Ninox novaeseelandiae</i>	LC	(sp)	2 (sp)	2 (sp)	1 (sp)						
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	LC								x		
Spotted Bowerbird	<i>Ptilonorhynchus maculatus</i>	LC							x, x	x	x	
Spotted Nightjar	<i>Eurostopodus argus</i>	LC										
Squatter Pigeon	<i>Geophaps scripta peninsulae</i>	LC						x	x	x		
Squatter Pigeon (Southern)	<i>Geophaps scripta scripta</i>	V						2	14		5	4
Striated Pardalote	<i>Pardalotus striatus</i>	LC		x		x			x	x	x	x
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>	LC	x						x			x
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC	x	x	x	x			x, x	x, x	x	x
Tawny Frogmouth	<i>Podargus strigoides</i>	LC				1 (sp)				x		
Torresian Crow	<i>Corvus orru</i>	LC		x	x	x			x	x, x	x	x
Varied Lorikeet	<i>Psitteuteles versicolor</i>	LC							x			

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			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Variegated Fairy-wren	<i>Malurus lamberti</i>	LC									x	
Wedge-tailed Eagle	<i>Aquila audax</i>	LC						x		x		x
Weebill	<i>Smicrornis brevirostris</i>	LC				x			x	x, x	x, x	x
Whistling Kite	<i>Haliastur sphenurus</i>	LC							x	x, x	x, x	x
White-bellied Cuckoo Shrike	<i>Coracina papuensis</i>	LC	x						x	x	x	
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	LC						x				
White-necked Heron	<i>Ardea pacifica</i>	LC										
White-throated Gerygone	<i>Gerygone albogularis</i>	LC	x	x					x			
White-throated Honeyeater	<i>Melithreptus albogularis</i>	LC								x		x
White-winged Triller	<i>Lalage sueurii</i>	LC									x	
Willie Wagtail	<i>Rhipidura leucophrys</i>	LC							x	x	x	x
Yellow Honeyeater	<i>Lichenostomus flavus</i>	LC										
Yellow-throated Miner	<i>Manorina flavigula</i>	LC						x				
Yellow-tinted Honeyeater	<i>Lichenostomus flavescens</i>	LC										
Zebra Finch	<i>Taeniopygia guttata</i>	LC						x			x	
Mammals												
Allied Rock Wallaby	<i>Petrogale assimilis</i>	LC										
Cat	<i>Felis catus</i>	* (RI)										
Common Wallaroo	<i>Macropus robustus</i>	LC				4 (sp)						
Delicate Mouse	<i>Pseudomys delicatulus</i>	LC										
Dingo, Domestic Dog	<i>Canis lupus</i>	* (RI)									x	
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	LC										
Koala	<i>Phascolarctos cinereus</i>	V						(sc) (tt)				
Northern Nailtail Wallaby	<i>Onychogalea unguifera</i>	LC										
Pig	<i>Sus scrofa</i>	* (RI)					8 (sp)					
Rabbit	<i>Oryctolagus cuniculus</i>	* (RI)										
Red Kangaroo	<i>Macropus rufous</i>	LC										

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			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	SLC										
Sugar Glider	<i>Petaurus breviceps</i>	LC	(sp)									
Reptiles												
Black-headed Monitor	<i>Varanus tristis</i>	LC	1 (pf)									
Black-headed Python	<i>Aspidites melanocephalus</i>	LC										
Box-patterned Gecko	<i>Lucasium steindachneri</i>	LC	1 (pf)	1			1 (sp)					
Burton's Legless Lizard	<i>Lialis burtonis</i>	LC			1 (pf)							
Bynoe's Gecko	<i>Heteronotia binoei</i>	LC			1 (as)	2 (sp)						
Common Dwarf Skink	<i>Menetia greyii</i>	LC	1 (pf)	1 (pf)								
Dubious Dtella	<i>Gehyra dubia</i>	LC		2 (sp)								
Eastern Beaked Gecko	<i>Rhynchoedura ormsbyi</i>	LC										
Eastern Stripped Skink	<i>Ctenotus robustus</i>	LC				6 (fu) 1 (as)					x	
Excitable Delma	<i>Delma tincta</i>	LC				1 (as)						
Fire-tailed Skink	<i>Morethia taeniopleura</i>	LC			4 (pf) 1 (fu) 1 (as)							
Greater Black Whipsnake	<i>Demansia papuensis</i>	LC										
Leonhard's Ctenotus	<i>Ctenotus leonhardii</i>	LC		1								
Leopard Ctenotus	<i>Ctenotus pantherinus</i>	LC				1 (fu)						
no common name	<i>Lerista zonulata</i>	LC										
Metallic Snake-eyed Skink	<i>Cryptoblepharus metallicus</i>	LC			1 (pf)							
Noonbah Robust Slider	<i>Lerista emmotti</i>	LC			4							
Northern Brown Snake	<i>Pseudonaja nuchalis</i>	LC										
Northern Spiny-tailed Gecko	<i>Strophurus ciliaris</i>	LC										
Northern Velvet Gecko	<i>Oedura castelnaui</i>	LC		2 (sp)								
Orange-naped Snake	<i>Furina ornata</i>	LC	1 (fu)									

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Common Name	Scientific Name	Status ¹	Trap Sites				Drive	Incidental	Black-throated Finch Sites			
			TS1	TS2	TS3	TS4			WP1	WP2	WP3	WP4
Ornate Soil-crevice Skink	<i>Notoscincus ornatus</i>	LC	1 (fu)	2 (pf) 4 1 (as)								
Ragged Snake-eyed Skink	<i>Cryptoblepharus pannosus</i>	LC	2 (pf)	1 1 (as)	6 (pf)							
Shaded-litter Rainbow-skink	<i>Carlia munda</i>	LC	1 (pf) 1 (fu)	4 3 (fu) 3 4 (pf) 20 (as)	11 (pf) 3 (fu) 4 (as)							
Storr's Monitor	<i>Varanus storri</i>	LC				2 (fu)						
Straight-browed Ctenotus	<i>Ctenotus spaldingi</i>	LC										
Tommy Roundhead	<i>Diporiphora australis</i>	LC		2 (fu)								
Two-toed fine-lined slider	<i>Lerista wilkinsi</i>	LC										
Unspotted Yellow-sided Ctenotus	<i>Ctenotus ingrami</i>	LC										
Zigzag Velvet Gecko	<i>Amalosia rhombifer</i>	LC	1 (pf)									

¹ Status:

NC Act: V = Vulnerable, SLC = Special least concern

Biosecurity Act: RI = Restricted invasive

* = exotic

TS = Trap Site; Supp = Supplementary Site; WP = Water Point; as = Active Search; cp = Call Playback; el = Elliot Trap; pf = Pitfall; sc = Scats; sp = Spotlight; tt = Track, scratch or digging; x = Present

Table F2: Fauna identified in the project site during seasonal surveys (excl. microchiropteran bats) (November 2017) - supplementary sites

Common Name	Scientific Name	Status ¹	Supplementary Sites																								
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp6	Supp7	Supp8	Supp9	Supp10	Supp11	Supp12	Supp13	Supp14	Supp15	Supp16	Supp17	Supp18	Supp19	Supp20	Supp21	Supp22	Supp23	Supp24	Supp25
Amphibians																											
Broad-palmed Rocket Frog	<i>Litoria latopalmata</i>	LC																				(sp)					(sp)
Bumpy Rocket Frog	<i>Litoria inermis</i>	LC																				(sp)					(sp)
Cane Toad	<i>Rhinella marina</i>	*																				(sp)					(sp)
Desert Tree Frog	<i>Litoria rubella</i>	LC																									(sp)
Eastern Snapping Frog	<i>Cyclorana novaehollandiae</i>	LC																				(sp)					(sp)
Green Tree Frog	<i>Litoria caerulea</i>	LC																									(sp)
Ornate Burrowing Frog	<i>Platyplectrum ornatum</i>	LC																				(sp)	3 (sp)				(sp)
Stonemason Toadlet	<i>Uperoleia lithomoda</i>	LC																									
Superb Collard Frog	<i>Cyclorana brevipes</i>	LC																									(sp)
Birds																											
Apostlebird	<i>Struthidea cinerea</i>	LC																	x								
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	LC																									
Australian Bustard	<i>Ardeotis australis</i>	LC																									
Australian Magpie	<i>Cracticus tibicen</i>	LC													x												
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	LC																						(sp)	1 (sp)		
Australian Raven	<i>Corvus coronoides</i>	LC																									
Banded Honeyeater	<i>Cissomela pectoralis</i>	LC																									
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	LC																									
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	LC								x			x		x	x					x						
Black-faced Woodswallow	<i>Artamus cinereus</i>	LC																									
Black-fronted Dotterel	<i>Elseyornis melanops</i>	LC																									
Black Kite	<i>Milvus migrans</i>	LC																									
Black-winged Stilt	<i>Himantopus himantopus</i>	LC																									
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	LC							x	x		x	x			x											
Blue-winged Kookaburra	<i>Dacelo leachii</i>	LC																									
Brolga	<i>Grus rubicunda</i>	LC																									
Brown Falcon	<i>Falco berigora</i>	LC																									
Brown Goshawk	<i>Accipiter fasciatus</i>	LC																									
Brown Honeyeater	<i>Lichmera indistincta</i>	LC					x																				
Budgerigar	<i>Melopsittacus undulatus</i>	LC																									
Bush Stone-curlew	<i>Burhinus grallarius</i>	LC															x										
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	LC																x									
Cicadabird	<i>Coracina tenuirostris</i>	LC																x									
Cockatiel	<i>Nymphicus hollandicus</i>	LC																									
Collard Sparrowhawk	<i>Accipiter cirrocephalus</i>	LC										x															
Common Bronzewing	<i>Phaps chalcoptera</i>	LC							x			x	x			x		x	x		x						
Crested Pigeon	<i>Ocyphaps lophotes</i>	LC															x										
Diamond Dove	<i>Geopelia cuneata</i>	LC																									

Common Name	Scientific Name	Status ¹	Supplementary Sites																								
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp6	Supp7	Supp8	Supp9	Supp10	Supp11	Supp12	Supp13	Supp14	Supp15	Supp16	Supp17	Supp18	Supp19	Supp20	Supp21	Supp22	Supp23	Supp24	Supp25
Dollarbird	<i>Eurystomus orientalis</i>	LC												x													
Double-barred Finch	<i>Taeniopygia bichenovii</i>	LC													x												
Eastern Koel	<i>Eudynamys orientalis</i>	LC					x											x	x								
Emu	<i>Dromaius novaehollandiae</i>	LC																									
Forest Kingfisher	<i>Todiramphus macleayii</i>	LC																									
Fork-tailed Swift	<i>Apus pacificus</i>	SLC																									
Freckled Duck	<i>Stictonetta naevosa</i>	LC																									
Galah	<i>Eolophus roseicapilla</i>	LC			x																						
Golden-headed Cisticola	<i>Cisticola exilis</i>	LC																									
Great Bowerbird	<i>Ptilonorhynchus nuchalis</i>	LC																									
Great Egret	<i>Ardea alba</i>	SLC																									
Grey Butcherbird	<i>Cracticus torquatus</i>	LC					x	x	x			x	x			x	x	x	x								
Grey Fantail	<i>Rhipidura albiscapa</i>	LC																									
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	LC					x					x									x						
Grey Teal	<i>Anas gracilis</i>	LC																									
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	LC																			x						
Ground Cuckoo-shrike	<i>Coracina maxima</i>	LC																									
Jacky Winter	<i>Microeca fascinans</i>	LC																									
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	LC																									
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	LC									x			x				x									
Leaden Flycatcher	<i>Myiagra rubecula</i>	LC																									
Little Friarbird	<i>Philemon citreogularis</i>	LC			x	x				x				x		x	x	x	x	x							
Magpie-lark	<i>Grallina cyanoleuca</i>	LC			x						x			x													
Masked Lapwing	<i>Vanellus</i>																										
Masked Woodswallow	<i>Artamus personatus</i>	LC															x										
Mistletoebird	<i>Dicaeum hirundinaceum</i>	LC																	x		x						
Nankeen Kestrel	<i>Falco cenchroides</i>	LC																									
Noisy Friarbird	<i>Philemon corniculatus</i>	LC																									
Olive-backed Oriole	<i>Oriolus sagittatus</i>	LC										x		x				x	x		x						
Pale-headed Rosella	<i>Platycercus adscitus</i>	LC					x			x	x	x					x	x		x	x						
Peaceful Dove	<i>Geopelia striata</i>	LC										x						x			x						
Peregrine Falcon	<i>Falco peregrinus</i>	LC												x													
Pheasant Coucal	<i>Centropus phasianinus</i>	LC							x											x							
Pied Butcherbird	<i>Cracticus nigrogularis</i>	LC			x				x	x					x			x	x								
Pied Currawong	<i>Strepera graculina</i>	LC			x																						
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	LC																									
Plum-headed Finch	<i>Neochmia modesta</i>	LC																									
Rainbow Bee-eater	<i>Merops ornatus</i>	SLC										x		x				x		x	x						
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	LC												x													
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	LC																									
Red-kneed Dotterel	<i>Erythronyctes cinctus</i>	LC																									

Common Name	Scientific Name	Status ¹	Supplementary Sites																								
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp6	Supp7	Supp8	Supp9	Supp10	Supp11	Supp12	Supp13	Supp14	Supp15	Supp16	Supp17	Supp18	Supp19	Supp20	Supp21	Supp22	Supp23	Supp24	Supp25
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii banksii</i>	LC							x		x		x		x			x			x						
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	LC																									
Rufous Whistler	<i>Pachycephala rufiventris</i>	LC																			x						
Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>	LC																									
Sacred Kingfisher	<i>Todiramphus sanctus</i>	LC										x					x	x									
Singing Honeyeater	<i>Lichenostomus virescens</i>	LC																									
Southern Boobook	<i>Ninox novaeseelandiae</i>	LC																					² (sp)		(sp)	(sp)	
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	LC																									
Spotted Bowerbird	<i>Ptilonorhynchus maculatus</i>	LC							x	x									x								
Spotted Nightjar	<i>Eurostopodus argus</i>	LC																									
Squatter Pigeon	<i>Geophaps scripta peninsulae</i>	LC			x				x								x										
Squatter Pigeon (Southern)	<i>Geophaps scripta scripta</i>	V																									
Striated Pardalote	<i>Pardalotus striatus</i>	LC								x		x															
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>	LC																	x		x						
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC					x				x	x		x					x								
Tawny Frogmouth	<i>Podargus strigoides</i>	LC																							(sp)		
Torresian Crow	<i>Corvus orru</i>	LC			x					x				x	x				x								
Varied Lorieet	<i>Psitteuteles versicolor</i>	LC																									
Variegated Fairy-wren	<i>Malurus lamberti</i>	LC																									
Wedge-tailed Eagle	<i>Aquila audax</i>	LC																									
Weebill	<i>Smicrornis brevirostris</i>	LC		x	x	x				x	x		x	x	x					x							
Whistling Kite	<i>Haliastur sphenurus</i>	LC																									
White-bellied Cuckoo Shrike	<i>Coracina papuensis</i>	LC										x							x								
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	LC																									
White-necked Heron	<i>Ardea pacifica</i>	LC																									
White-throated Gerygone	<i>Gerygone albogularis</i>	LC					x						x					x	x								
White-throated Honeyeater	<i>Melithreptus albogularis</i>	LC																									
White-winged Triller	<i>Lalage sueurii</i>	LC																									
Willie Wagtail	<i>Rhipidura leucophrys</i>	LC																									
Yellow Honeyeater	<i>Lichenostomus flavus</i>	LC					x																				
Yellow-throated Miner	<i>Manorina flavigula</i>	LC							x		x						x		x		x						
Yellow-tinted Honeyeater	<i>Lichenostomus flavescens</i>	LC																									
Zebra Finch	<i>Taeniopygia guttata</i>	LC																									
Mammals																											
Allied Rock Wallaby	<i>Petrogale assimilis</i>	LC																									
Cat	<i>Felis catus</i>	* (RI)																									
Common Wallaroo	<i>Macropus robustus</i>	LC																									¹ (sp)

Common Name	Scientific Name	Status ¹	Supplementary Sites																								
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp6	Supp7	Supp8	Supp9	Supp10	Supp11	Supp12	Supp13	Supp14	Supp15	Supp16	Supp17	Supp18	Supp19	Supp20	Supp21	Supp22	Supp23	Supp24	Supp25
Delicate Mouse	<i>Pseudomys delicatulus</i>	LC																									
Dingo, Domestic Dog	<i>Canis lupus</i>	* (RI)																									
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	LC																									
Koala	<i>Phascolarctos cinereus</i>	V																									
Northern Nailtail Wallaby	<i>Onychogalea unguifera</i>	LC																									
Pig	<i>Sus scrofa</i>	* (RI)																									
Rabbit	<i>Oryctolagus cuniculus</i>	* (RI)																									
Red Kangaroo	<i>Macropus rufous</i>	LC																					1				
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	SLC																							(sp)		
Sugar Glider	<i>Petaurus breviceps</i>	LC																									
Reptiles																											
Black-headed Monitor	<i>Varanus tristis</i>	LC														1 (as)											
Black-headed Python	<i>Aspidites melanocephalus</i>	LC																									
Box-patterned Gecko	<i>Lucasium steindachneri</i>	LC																							2 (sp)	(sp)	
Burton's Legless Lizard	<i>Lialis burtonis</i>	LC																									
Bynoe's Gecko	<i>Heteronotia binoei</i>	LC	1 (as)					4 (as)	2 (as)							2 (as)			1 (as)					2 (sp)	(sp)	1 (sp)	(sp)
Common Dwarf Skink	<i>Menetia greyii</i>	LC					1 (as)		2 (as)	1 (as)								1 (as)									
Dubious Dtella	<i>Gehyra dubia</i>	LC									1 (as)												15 (sp)			2 (sp)	
Eastern Beaked Gecko	<i>Rhynchoedura ormsbyi</i>	LC																									
Eastern Stripped Skink	<i>Ctenotus robustus</i>	LC																		2 (as)							
Excitable Delma	<i>Delma tincta</i>	LC																									
Fire-tailed Skink	<i>Morethia taeniopleura</i>	LC																									
Greater Black Whipsnake	<i>Demansia papuensis</i>	LC																									
Leonhard's Ctenotus	<i>Ctenotus leonhardii</i>	LC															1 (as)										
Leopard Ctenotus	<i>Ctenotus pantherinus</i>	LC																									
no common name	<i>Lerista zonulata</i>	LC																									
Metallic Snake-eyed Skink	<i>Cryptoblepharus metallicus</i>	LC																									
Noonbah Robust Slider	<i>Lerista emmotti</i>	LC					1 (as)																				
Northern Brown Snake	<i>Pseudonaja nuchalis</i>	LC												1 (as)													
Northern Spiny-tailed Gecko	<i>Strophurus ciliaris</i>	LC																									
Northern Velvet Gecko	<i>Oedura castelnaui</i>	LC																						1 (sp)			
Orange-naped Snake	<i>Furina ornata</i>	LC																1 (as)									
Ornate Soil-crevice Skink	<i>Notoscincus ornatus</i>	LC	1 (as)				2 (as)		6 (as)	5 (as)	2 (as)						2	2 (as)	3 (as)								
Ragged Snake-eyed Skink	<i>Cryptoblepharus pannosus</i>	LC	2 (as)		1 (as)		2 (as)		2 (as)	2 (as)	2 (as)																

Common Name	Scientific Name	Status ¹	Supplementary Sites																								
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp6	Supp7	Supp8	Supp9	Supp10	Supp11	Supp12	Supp13	Supp14	Supp15	Supp16	Supp17	Supp18	Supp19	Supp20	Supp21	Supp22	Supp23	Supp24	Supp25
Shaded-litter Rainbow-skink	<i>Carlia munda</i>	LC	5 (as)		4 (as)		4 (as)	4 (as)	6 (as)	2 (as)	4 (as)	4 (as)	3 (as)	2 (as)	2 (as)	2 (as)	7 (as)	1 (as)									
Storr's Monitor	<i>Varanus storri</i>	LC														1 (as)											
Straight-browed Ctenotus	<i>Ctenotus spaldingi</i>	LC												1 (as)													
Tommy Roundhead	<i>Diporiphora australis</i>	LC																									
Two-toed fine-lined slider	<i>Lerista wilkinsi</i>	LC											1 (as)					3 (as)		1 (as)							
Unspotted Yellow-sided Ctenotus	<i>Ctenotus ingrami</i>	LC													5 (as)												
Zigzag Velvet Gecko	<i>Amalosia rhombifer</i>	LC																									

¹ Status:
NC Act: V = Vulnerable, SLC = Special least concern
Biosecurity Act: RI = Restricted invasive
* = exotic
TS = Trap Site; Supp = Supplementary Site; WP = Water Point; as = Active Search; cp = Call Playback; el = Elliot Trap; pf = Pitfall; sc = Scats; sp = Spotlight; tt = Track, scratch or digging; x = Present

Table F3: Microchiropteran bats identified in the project site during seasonal surveys (November 2017) – Harp trap and Anabat sites

Common Name	Scientific Name	NC Act Status ¹	Harp Trap 1	Anabat sites												
				AB1 (DPM)	AB2 (DPM)	AB3 (GLE)	AB4 (GLE)	AB5 (GLE)	AB6 (GLE)	AB7 (DPM)	AB8 (DPM)	AB9 (GLE)	AB10 (GLE)	AB11 (DPM)	AB12 (DPM)	AB13 (GLE)
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	LC											◆	◆	◆	◆
Eastern Bent-winged Bat	<i>Miniopterus orianae</i>	LC						◆					◆	◆	◆	◆
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	LC														
Eastern Horse-shoe Bat	<i>Rhinolophus megaphyllus</i>	LC								◆		◆				
Free-tailed Bat	<i>Ozimops halli</i> / <i>Ozimops ridei</i>	LC		◆	◆	◆	◆	◆	◆	◆	◆			◆	◆	□
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	LC	1	◆	◆		◆	◆	◆				◆	◆	◆	◆
Hairy-nosed Freetail Bat	<i>Setirostris eleryi</i>	LC		□	□								□			
Hoary Wattled Bat	<i>Chalinolobus nigrogriseus</i>	LC	2	◆	◆	□	◆	◆	◆	□	◆	□	◆	◆	◆	□
Inland Broad-nosed Bat	<i>Scotorepens balstoni</i>	LC			□			□							◆	□
Inland Forest Bat	<i>Vespadelus bravastocki</i>	LC		◆	◆									◆	◆	◆
Inland Free-tailed Bat	<i>Ozimops petersi</i>	LC														
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	LC														
Little Broad-nosed Bat	<i>Scotorepens greyii</i>	LC	14	◆	◆	◆	◆	◆	◆	◆	□	□	◆	◆	◆	◆
Little Pied Bat	<i>Chalinolobus picatus</i>	LC		□										□		
Long-eared Bat	<i>Nyctophilus sp.</i>	LC			◆	◆		◆					◆	◆	◆	
Northern Broad-nosed bat	<i>Scotorepens sanborni</i>	LC														

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Common Name	Scientific Name	NC Act Status ¹	Harp Trap 1	Anabat sites												
				AB1 (DPM)	AB2 (DPM)	AB3 (GLE)	AB4 (GLE)	AB5 (GLE)	AB6 (GLE)	AB7 (DPM)	AB8 (DPM)	AB9 (GLE)	AB10 (GLE)	AB11 (DPM)	AB12 (DPM)	AB13 (GLE)
Northern Freetail Bat	<i>Chaerephon jobensis</i>	LC		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Northern Free-tailed Bat	<i>Ozimops lumsdenae</i>	LC			◆	◆	◆	◆	◆	◆			◆	◆	◆	◆
Troughton's Sheath-tailed Bat	<i>Taphozous troughtoni</i>	LC				◆	◆		◆			◆	□		□	◆
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>	LC		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

¹ NC Act Status: V = Vulnerable, SLC = Special least concern

◆ = at least one call from the site was attributed unequivocally to the species; □ = calls similar to those of the species were recorded, but could not be reliably identified;

h = species heard; sp = spotlight

Table F4: Fauna identified in the project site during seasonal surveys (excl. microchiropteran bats) (April 2019) – Trap sites, supplementary sites, infrared cameras and incidental records

Common Name	Scientific Name	Status ¹	Trap sites			Supplementary sites																			IR camera	Incidental	
			TS5	TS6	TS7	Supp 26	Supp 27	Supp 28	Supp 29	Supp 30	Supp 31	Supp 32	Supp 33	Supp 34	Supp 35	Supp 36	Supp 37	Supp 38	Supp 39	Supp 40	Supp 41	Supp 42	Supp 43	Supp 44			
Amphibians																											
Broad-palmed Rocket Frog	<i>Litoria latopalmata</i>	LC																									
Bumpy Rocket Frog	<i>Litoria inermis</i>	LC								4 (sp)																	
Cane Toad	<i>Rhinella marina</i>	*								100 (sp)	25 (sp)												1 (as)				
Desert Tree Frog	<i>Litoria rubella</i>	LC								3 (sp)																	
Eastern Snapping Frog	<i>Cyclorana novaehollandiae</i>	LC					1 (sp)			6 (sp)																	
Green Tree Frog	<i>Litoria caerulea</i>	LC						7 (sp)		3 (sp)																	
Ornate Burrowing Frog	<i>Platyplectrum ornatum</i>	LC					7 (sp)			10 (sp)	4 (sp)																
Stonemason Toadlet	<i>Uperoleia lithomoda</i>	LC																									
Superb Collard Frog	<i>Cyclorana brevipes</i>	LC																									
Birds																											
Apostlebird	<i>Struthidea cinerea</i>	LC	x															x								x	
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	LC																									
Australian Bustard	<i>Ardeotis australis</i>	LC																									
Australian Magpie	<i>Cracticus tibicen</i>	LC			x					x		x	x			x		x			x				x		
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	LC	(sp)	(sp)					(sp)							(sp)										x	
Australian Raven	<i>Corvus coronoides</i>	LC																x									
Banded Honeyeater	<i>Cissomela pectoralis</i>	LC																									
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	LC																									
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	LC	x		x							x				x	x						x			x	
Black-faced Woodswallow	<i>Artamus cinereus</i>	LC																								x	
Black-fronted Dotterel	<i>Eelseyornis melanops</i>	LC																									
Black Kite	<i>Milvus migrans</i>	LC																									
Black-winged Stilt	<i>Himantopus himantopus</i>	LC																									
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	LC										x	x													x	
Blue-winged Kookaburra	<i>Dacelo leachii</i>	LC															x									x	
Brolga	<i>Grus rubicunda</i>	LC																								x	
Brown Falcon	<i>Falco berigora</i>	LC	x															x									
Brown Goshawk	<i>Accipiter fasciatus</i>	LC															x										
Brown Honeyeater	<i>Lichmera indistincta</i>	LC									x						x		x			x				x	
Budgerigar	<i>Melopsittacus undulatus</i>	LC																									
Bush Stone-curlew	<i>Burhinus grallarius</i>	LC																								x	

Common Name	Scientific Name	Status ¹	Trap sites			Supplementary sites																				IR camera	Incidental
			TS5	TS6	TS7	Supp 26	Supp 27	Supp 28	Supp 29	Supp 30	Supp 31	Supp 32	Supp 33	Supp 34	Supp 35	Supp 36	Supp 37	Supp 38	Supp 39	Supp 40	Supp 41	Supp 42	Supp 43	Supp 44			
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	LC																									
Cicadabird	<i>Coracina tenuirostris</i>	LC																									x
Cockatiel	<i>Nymphicus hollandicus</i>	LC	x														x										x
Collard Sparrowhawk	<i>Accipiter cirrocephalus</i>	LC	x																								x
Common Bronzewing	<i>Phaps chalcoptera</i>	LC	x						x							x	x									x	x
Crested Pigeon	<i>Ocyphaps lophotes</i>	LC															x									x	
Diamond Dove	<i>Geopelia cuneata</i>	LC	x																							x	
Dollarbird	<i>Eurystomus orientalis</i>	LC																									
Double-barred Finch	<i>Taeniopygia bichenovii</i>	LC														x					x					x	
Eastern Koel	<i>Eudynamys orientalis</i>	LC		x																							
Emu	<i>Dromaius novaehollandiae</i>	LC															x								x	x	
Forest Kingfisher	<i>Todiramphus macleayii</i>	LC																								x	
Fork-tailed Swift	<i>Apus pacificus</i>	SLC																									
Freckled Duck	<i>Stictonetta naevosa</i>	LC																									
Galah	<i>Eolophus roseicapilla</i>	LC	x	x					x							x	x								x		
Golden-headed Cisticola	<i>Cisticola exilis</i>	LC																									
Great Bowerbird	<i>Ptilonorhynchus nuchalis</i>	LC			x																		x				
Great Egret	<i>Ardea alba</i>	SLC																									
Grey Butcherbird	<i>Cracticus torquatus</i>	LC	x	x					x			x									x						
Grey Fantail	<i>Rhipidura albiscapa</i>	LC	x						x			x				x					x	x					
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	LC	x																x							x	
Grey Teal	<i>Anas gracilis</i>	LC																									
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	LC															x	x			x						
Ground Cuckoo-shrike	<i>Coracina maxima</i>	LC																									
Jacky Winter	<i>Microeca fascinans</i>	LC																									
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	LC																									
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	LC			x											x					x					x	
Leaden Flycatcher	<i>Myiagra rubecula</i>	LC																									
Little Friarbird	<i>Philemon citreogularis</i>	LC	x		x								x			x						x				x	
Magpie-lark	<i>Grallina cyanoleuca</i>	LC											x				x						x		x	x	
Masked Lapwing	<i>Vanellus</i>																									x	
Masked Woodswallow	<i>Artamus personatus</i>	LC																									
Mistletoebird	<i>Dicaeum hirundinaceum</i>	LC																	x		x					x	
Nankeen Kestrel	<i>Falco cenchroides</i>	LC																								x	

Common Name	Scientific Name	Status ¹	Trap sites			Supplementary sites																				IR camera	Incidental	
			TS5	TS6	TS7	Supp 26	Supp 27	Supp 28	Supp 29	Supp 30	Supp 31	Supp 32	Supp 33	Supp 34	Supp 35	Supp 36	Supp 37	Supp 38	Supp 39	Supp 40	Supp 41	Supp 42	Supp 43	Supp 44				
Noisy Friarbird	<i>Philemon corniculatus</i>	LC	x	x									x					x	x			x					x	
Olive-backed Oriole	<i>Oriolus sagittatus</i>	LC	x	x																								
Pale-headed Rosella	<i>Platycercus adscitus</i>	LC							x							x							x				x	
Peaceful Dove	<i>Geopelia striata</i>	LC		x					x							x			x								x	
Peregrine Falcon	<i>Falco peregrinus</i>	LC																										
Pheasant Coucal	<i>Centropus phasianinus</i>	LC																				x				x	x	
Pied Butcherbird	<i>Cracticus nigrogularis</i>	LC	x	x	x					x			x	x				x		x							x	x
Pied Currawong	<i>Strepera graculina</i>	LC																	x			x						
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	LC																									x	
Plum-headed Finch	<i>Neochmia modesta</i>	LC																										
Rainbow Bee-eater	<i>Merops ornatus</i>	SLC	x						x																		x	
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	LC	x		x												x					x		x			x	
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	LC																x										
Red-kneed Dotterel	<i>Erythrogonys cinctus</i>	LC																										
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii banksii</i>	LC	x		x													x	x								x	
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	LC		x																							x	
Rufous Whistler	<i>Pachycephala rufiventris</i>	LC	x	x					x				x				x	x				x					x	
Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>	LC																										
Sacred Kingfisher	<i>Todiramphus sanctus</i>	LC																										
Singing Honeyeater	<i>Lichenostomus virescens</i>	LC																									x	
Southern Boobook	<i>Ninox novaeseelandiae</i>	LC	(cp)	(cp)			1 (sp)	1 (sp)	(cp)	(cp)	(sp)			(cp)		(sp)					(cp)			(cp)				
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	LC	x																								x	
Spotted Bowerbird	<i>Ptilonorhynchus maculatus</i>	LC	x																								x	
Spotted Nightjar	<i>Eurostopodus argus</i>	LC																									x	
Squatter Pigeon	<i>Geophaps scripta peninsulae</i>	LC																										
Squatter Pigeon (Southern)	<i>Geophaps scripta scripta</i>	V														2 x											50	
Striated Pardalote	<i>Pardalotus striatus</i>	LC		x					x	x			x				x	x	x	x		x	x	x			x	
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>	LC	x																								x	
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC	x															x	x			x						
Tawny Frogmouth	<i>Podargus strigoides</i>	LC		(sp)											(sp)													
Torresian Crow	<i>Corvus orru</i>	LC	x	x														x										
Varied Lorikeet	<i>Psitteuteles versicolor</i>	LC	x																									
Variegated Fairy-wren	<i>Malurus lamberti</i>	LC																										

Common Name	Scientific Name	Status ¹	Trap sites			Supplementary sites																				IR camera	Incidental
			TS5	TS6	TS7	Supp 26	Supp 27	Supp 28	Supp 29	Supp 30	Supp 31	Supp 32	Supp 33	Supp 34	Supp 35	Supp 36	Supp 37	Supp 38	Supp 39	Supp 40	Supp 41	Supp 42	Supp 43	Supp 44			
Wedge-tailed Eagle	<i>Aquila audax</i>	LC	x														x										
Weebill	<i>Smicrornis brevirostris</i>	LC	x						x	x	x	x	x			x	x	x	x								x
Whistling Kite	<i>Haliastur sphenurus</i>	LC	x																		x	x				x	
White-bellied Cuckoo Shrike	<i>Coracina papuensis</i>	LC																									
White-breasted Woodswallow	<i>Artamus leucorynchus</i>	LC																									
White-necked Heron	<i>Ardea pacifica</i>	LC																								x	
White-throated Gerygone	<i>Gerygone albogularis</i>	LC																									x
White-throated Honeyeater	<i>Melithreptus albogularis</i>	LC		x									x			x											
White-winged Triller	<i>Lalage sueurii</i>	LC																									
Willie Wagtail	<i>Rhipidura leucophrys</i>	LC							x																		x
Yellow Honeyeater	<i>Lichenostomus flavus</i>	LC																									
Yellow-throated Miner	<i>Manorina flavigula</i>	LC																					x				x
Yellow-tinted Honeyeater	<i>Lichenostomus flavescens</i>	LC																									
Zebra Finch	<i>Taeniopygia guttata</i>	LC																									
Mammals																											
Allied Rock Wallaby	<i>Petrogale assimilis</i>	LC																							x		
Cat	<i>Felis catus</i>	* (RI)																							x		x
Common Wallaroo	<i>Macropus robustus</i>	LC		5 (sp) 1 (as)	1 (as)			2 (sp)		1 (sp)								(as)				(as)			x		x
Delicate Mouse	<i>Pseudomys delicatulus</i>	LC																						1 (sp)			
Dingo, Domestic Dog	<i>Canis lupus</i>	* (RI)								1 (sp)																	x
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	LC																							x		x
Koala	<i>Phascolarctos cinereus</i>	V																									
Northern Nailtail Wallaby	<i>Onychogalea unguifera</i>	LC																							x		
Pig	<i>Sus scrofa</i>	* (RI)		(sc)																		(as)			x		
Rabbit	<i>Oryctolagus cuniculus</i>	* (RI)																							x		
Red Kangaroo	<i>Macropus rufous</i>	LC												(sp)			(as)			4 (sp)					x		x
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	SLC		(sc)														(sc)							x		x
Sugar Glider	<i>Petaurus breviceps</i>	LC																									
Reptiles																											
Black-headed Monitor	<i>Varanus tristis</i>	LC		1 (el)																							
Black-headed Python	<i>Aspidites melanocephalus</i>	LC		x																							
Box-patterned Gecko	<i>Lucasium steindachneri</i>	LC																									

Common Name	Scientific Name	Status ¹	Trap sites			Supplementary sites																			IR camera	Incidental
			TS5	TS6	TS7	Supp 26	Supp 27	Supp 28	Supp 29	Supp 30	Supp 31	Supp 32	Supp 33	Supp 34	Supp 35	Supp 36	Supp 37	Supp 38	Supp 39	Supp 40	Supp 41	Supp 42	Supp 43	Supp 44		
Burton's Legless Lizard	<i>Lialis burtonis</i>	LC																								
Bynoe's Gecko	<i>Heteronotia binoei</i>	LC			1 (fu) 1 (as)						1 (sp)															
Common Dwarf Skink	<i>Menetia greyii</i>	LC																								x
Dubious Dtella	<i>Gehyra dubia</i>	LC					2 (sp)			2 (sp)						2 (sp)										
Eastern Beaked Gecko	<i>Rhynchoedura ormsbyi</i>	LC	1 (pf)																							
Eastern Stripped Skink	<i>Ctenotus robustus</i>	LC																								
Excitable Delma	<i>Delma tincta</i>	LC																								
Fire-tailed Skink	<i>Morethia taeniopleura</i>	LC																								
Greater Black Whipsnake	<i>Demansia papuensis</i>	LC			1 (el)																					
Leonhard's Ctenotus	<i>Ctenotus leonhardii</i>	LC																								
Leopard Ctenotus	<i>Ctenotus pantherinus</i>	LC																								
no common name	<i>Lerista zonulata</i>	LC																								x
Metallic Snake-eyed Skink	<i>Cryptoblepharus metallicus</i>	LC																								
Noonbah Robust Slider	<i>Lerista emmotti</i>	LC	1 (pf)		2 (pf) 1 (as)					1(as)																
Northern Brown Snake	<i>Pseudonaja nuchalis</i>	LC																								
Northern Spiny-tailed Gecko	<i>Strophurus ciliaris</i>	LC																			1 (sp)					
Northern Velvet Gecko	<i>Oedura castelnaui</i>	LC												(as)												
Orange-naped Snake	<i>Furina ornata</i>	LC																								
Ornate Soil-crevice Skink	<i>Notoscincus ornatus</i>	LC	1 (fu) 2 (as)		1 (fu)																					x
Ragged Snake-eyed Skink	<i>Cryptoblepharus pannosus</i>	LC														3 (as)										
Shaded-litter Rainbow-skink	<i>Carlia munda</i>	LC	2 (fu)		1 (pf)		2 (sp)			1(as)						1 (as)							1 (as)			
Storr's Monitor	<i>Varanus storri</i>	LC																								
Straight-browed Ctenotus	<i>Ctenotus spaldingi</i>	LC																								
Tommy Roundhead	<i>Diporiphora australis</i>	LC																								
Two-toed fine-lined slider	<i>Lerista wilkinsi</i>	LC																								x
Unspotted Yellow-sided Ctenotus	<i>Ctenotus ingrami</i>	LC																								
Zigzag Velvet Gecko	<i>Amalosia rhombifer</i>	LC														2 (sp)										

¹ Status:

NC Act: V = Vulnerable, SLC = Special least concern

Biosecurity Act: RI = Restricted invasive

* = exotic

TS = Trap Site; Supp = Supplementary Site; WP = Water Point; IR = Infra-red; as = Active Search; cp = Call Playback; el = Elliot Trap; pf = Pitfall; sc = Scats; sp = Spotlight; tt = Track, scratch or digging; x = Present

Table F5: Fauna identified in the project site during seasonal surveys (excl. microchiropteran bats) (April 2021) – Supplementary sites and incidental records

Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Amphibians												
Broad-palmed Rocket Frog	<i>Litoria latopalmata</i>	LC										
Bumpy Rocket Frog	<i>Litoria inermis</i>	LC										
Cane Toad	<i>Rhinella marina</i>	*										
Desert Tree Frog	<i>Litoria rubella</i>	LC										
Eastern Snapping Frog	<i>Cyclorana novaehollandiae</i>	LC										
Green Tree Frog	<i>Litoria caerulea</i>	LC										
Ornate Burrowing Frog	<i>Platyplectrum ornatum</i>	LC										
Stonemason Toadlet	<i>Uperoleia lithomoda</i>	LC										
Superb Collard Frog	<i>Cyclorana brevipes</i>	LC										
Birds												
Apostlebird	<i>Struthidea cinerea</i>	LC										x
Australasian Grebe	<i>Tachybaptus novaehollandiae</i>	LC										
Australian Bustard	<i>Ardeotis australis</i>	LC										
Australian Magpie	<i>Cracticus tibicen</i>	LC				x		x	x	x	x	
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>	LC						(sp)				x
Australian Raven	<i>Corvus coronoides</i>	LC										
Banded Honeyeater	<i>Cissomela pectoralis</i>	LC										
Black-breasted Buzzard	<i>Hamirostra melanosternon</i>	LC										x
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	LC	x				x	x	x		x	

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Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Black-faced Woodswallow	<i>Artamus cinereus</i>	LC										
Black-fronted Dotterel	<i>Euseyornis melanops</i>	LC										
Black Kite	<i>Milvus migrans</i>	LC										
Black-winged Stilt	<i>Himantopus himantopus</i>	LC										
Blue-faced Honeyeater	<i>Entomyzon cyanotis</i>	LC					x		x	x	x	
Blue-winged Kookaburra	<i>Dacelo leachii</i>	LC						x				
Brolga	<i>Grus rubicunda</i>	LC										
Brown Falcon	<i>Falco berigora</i>	LC									x	
Brown Goshawk	<i>Accipiter fasciatus</i>	LC										x
Brown Honeyeater	<i>Lichmera indistincta</i>	LC		x					x			
Budgerigar	<i>Melopsittacus undulatus</i>	LC										
Bush Stone-curlew	<i>Burhinus grallarius</i>	LC										x
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>	LC										
Cicadabird	<i>Coracina tenuirostris</i>	LC										
Cockatiel	<i>Nymphicus hollandicus</i>	LC										
Collard Sparrowhawk	<i>Accipiter cirrocephalus</i>	LC										
Common Bronzewing	<i>Phaps chalcoptera</i>	LC					x					
Crested Pigeon	<i>Ocyphaps lophotes</i>	LC		x								
Diamond Dove	<i>Geopelia cuneata</i>	LC						x				x
Dollarbird	<i>Eurystomus orientalis</i>	LC										
Double-barred Finch	<i>Taeniopygia bichenovii</i>	LC	x	x	x				x		x	

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Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Eastern Koel	<i>Eudynamys orientalis</i>	LC										
Emu	<i>Dromaius novaehollandiae</i>	LC										x
Forest Kingfisher	<i>Todiramphus macleayii</i>	LC										
Fork-tailed Swift	<i>Apus pacificus</i>	SLC										
Freckled Duck	<i>Stictonetta naevosa</i>	LC										
Galah	<i>Eolophus roseicapilla</i>	LC	x								x	
Golden-headed Cisticola	<i>Cisticola exilis</i>	LC										
Great Bowerbird	<i>Ptilonorhynchus nuchalis</i>	LC										
Great Egret	<i>Ardea alba</i>	SLC										
Grey Butcherbird	<i>Cracticus torquatus</i>	LC										
Grey Fantail	<i>Rhipidura albiscapa</i>	LC		x				x			x	
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	LC										
Grey Teal	<i>Anas gracilis</i>	LC										
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>	LC								x		
Ground Cuckoo-shrike	<i>Coracina maxima</i>	LC										x
Jacky Winter	<i>Microeca fascinans</i>	LC										x
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	LC										
Laughing Kookaburra	<i>Dacelo novaeguineae</i>	LC			x	x	x					
Leaden Flycatcher	<i>Myiagra rubecula</i>	LC							x			
Little Friarbird	<i>Philemon citreogularis</i>	LC				x		x	x			
Magpie-lark	<i>Grallina cyanoleuca</i>	LC						x				

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Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Masked Lapwing	<i>Vanellus</i>											
Masked Woodswallow	<i>Artamus personatus</i>	LC										
Mistletoebird	<i>Dicaeum hirundinaceum</i>	LC		x								
Nankeen Kestrel	<i>Falco cenchroides</i>	LC										
Noisy Friarbird	<i>Philemon corniculatus</i>	LC										
Olive-backed Oriole	<i>Oriolus sagittatus</i>	LC		x								
Pale-headed Rosella	<i>Platycercus adscitus</i>	LC		x				x	x		x	
Peaceful Dove	<i>Geopelia striata</i>	LC	x					x	x		x	
Peregrine Falcon	<i>Falco peregrinus</i>	LC										
Pheasant Coucal	<i>Centropus phasianinus</i>	LC										
Pied Butcherbird	<i>Cracticus nigrogularis</i>	LC	x		x		x	x	x	x	x	
Pied Currawong	<i>Strepera graculina</i>	LC										
Plumed Whistling-Duck	<i>Dendrocygna eytoni</i>	LC										
Plum-headed Finch	<i>Neochmia modesta</i>	LC										
Rainbow Bee-eater	<i>Merops ornatus</i>	SLC					x		x			x
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	LC		x		x		x			x	
Red-backed Fairy-wren	<i>Malurus melanocephalus</i>	LC										
Red-kneed Dotterel	<i>Erythronyx cinctus</i>	LC										
Red-tailed Black Cockatoo	<i>Calyptorhynchus banksii banksii</i>	LC										
Red-winged Parrot	<i>Aprosmictus erythropterus</i>	LC									x	x
Rufous Whistler	<i>Pachycephala rufiventris</i>	LC						x				

Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Rufous-throated Honeyeater	<i>Conopophila rufogularis</i>	LC										
Sacred Kingfisher	<i>Todiramphus sanctus</i>	LC										
Singing Honeyeater	<i>Lichenostomus virescens</i>	LC										
Southern Boobook	<i>Ninox novaeseelandiae</i>	LC						(sp)				
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	LC										
Spotted Bowerbird	<i>Ptilonorhynchus maculatus</i>	LC		x								
Spotted Nightjar	<i>Eurostopodus argus</i>	LC										x
Squatter Pigeon	<i>Geophaps scripta peninsulae</i>	LC					x		x			
Squatter Pigeon (Southern)	<i>Geophaps scripta scripta</i>	V										
Striated Pardalote	<i>Pardalotus striatus</i>	LC	x		x	x	x	x		x	x	
Striped Honeyeater	<i>Plectorhyncha lanceolata</i>	LC						x				
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	LC	x								x	
Tawny Frogmouth	<i>Podargus strigoides</i>	LC						x				
Torresian Crow	<i>Corvus orru</i>	LC	x					x				
Varied Lorikeet	<i>Psitteuteles versicolor</i>	LC										x
Variegated Fairy-wren	<i>Malurus lamberti</i>	LC										
Wedge-tailed Eagle	<i>Aquila audax</i>	LC										x
Weebill	<i>Smicrornis brevirostris</i>	LC	x	x	x	x	x	x	x	x	x	
Whistling Kite	<i>Haliastur sphenurus</i>	LC										x
White-bellied Cuckoo Shrike	<i>Coracina papuensis</i>	LC										

Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>	LC										
White-necked Heron	<i>Ardea pacifica</i>	LC										
White-throated Gerygone	<i>Gerygone albogularis</i>	LC						x	x		x	
White-throated Honeyeater	<i>Melithreptus albogularis</i>	LC		x							x	
White-winged Triller	<i>Lalage sueurii</i>	LC										x
Willie Wagtail	<i>Rhipidura leucophrys</i>	LC						x	x			
Yellow Honeyeater	<i>Lichenostomus flavus</i>	LC		x							x	
Yellow-throated Miner	<i>Manorina flavigula</i>	LC		x					x	x		
Yellow-tinted Honeyeater	<i>Lichenostomus flavescens</i>	LC				x					x	x
Zebra Finch	<i>Taeniopygia guttata</i>	LC										
Mammals												
Allied Rock Wallaby	<i>Petrogale assimilis</i>	LC										
Cat	<i>Felis catus</i>	* (RI)										
Common Wallaroo	<i>Macropus robustus</i>	LC									(as)	
Delicate Mouse	<i>Pseudomys delicatulus</i>	LC										
Dingo, Domestic Dog	<i>Canis lupus</i>	* (RI)										
Eastern Grey Kangaroo	<i>Macropus giganteus</i>	LC										
Koala	<i>Phascolarctos cinereus</i>	V										
Northern Nailtail Wallaby	<i>Onychogalea unguifera</i>	LC										
Pig	<i>Sus scrofa</i>	* (RI)							(as)			
Rabbit	<i>Oryctolagus cuniculus</i>	* (RI)										

Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Red Kangaroo	<i>Macropus rufous</i>	LC										
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>	SLC										
Sugar Glider	<i>Petaurus breviceps</i>	LC										
Reptiles												
Black-headed Monitor	<i>Varanus tristis</i>	LC										
Black-headed Python	<i>Aspidites melanocephalus</i>	LC										
Box-patterned Gecko	<i>Lucasium steindachneri</i>	LC										
Burton's Legless Lizard	<i>Lialis burtonis</i>	LC										
Bynoe's Gecko	<i>Heteronotia binoei</i>	LC										
Common Dwarf Skink	<i>Menetia greyii</i>	LC	1(as)									
Dubious Dtella	<i>Gehyra dubia</i>	LC						(sp)				
Eastern Beaked Gecko	<i>Rhynchoedura ormsbyi</i>	LC										
Eastern Stripped Skink	<i>Ctenotus robustus</i>	LC										
Excitable Delma	<i>Delma tinctoria</i>	LC										
Fire-tailed Skink	<i>Morethia taeniopleura</i>	LC									(as)	
Greater Black Whipsnake	<i>Demansia papuensis</i>	LC										
Leonhard's Ctenotus	<i>Ctenotus leonhardii</i>	LC										
Leopard Ctenotus	<i>Ctenotus pantherinus</i>	LC										
no common name	<i>Lerista zonulata</i>	LC										
Metallic Snake-eyed Skink	<i>Cryptoblepharus metallicus</i>	LC										
Noonbah Robust Slider	<i>Lerista emmotti</i>	LC										

Common Name	Scientific Name	Status ¹	Supplementary sites									Incidental
			Supp1	Supp2	Supp3	Supp4	Supp5	Supp10	Supp11	Supp12	Supp19	
Northern Brown Snake	<i>Pseudonaja nuchalis</i>	LC										
Northern Spiny-tailed Gecko	<i>Strophurus ciliaris</i>	LC										
Northern Velvet Gecko	<i>Oedura castelnaui</i>	LC										
Orange-naped Snake	<i>Furina ornata</i>	LC										
Ornate Soil-crevice Skink	<i>Notoscincus ornatus</i>	LC	1(as)			1(as)						
Ragged Snake-eyed Skink	<i>Cryptoblepharus pannosus</i>	LC				1(as)						
Shaded-litter Rainbow-skink	<i>Carlia munda</i>	LC			1(as)					1(as)		
Storr's Monitor	<i>Varanus storri</i>	LC										
Straight-browed Ctenotus	<i>Ctenotus spaldingi</i>	LC										
Tommy Roundhead	<i>Diporiphora australis</i>	LC										
Two-toed fine-lined slider	<i>Lerista wilkinsi</i>	LC										
Unspotted Yellow-sided Ctenotus	<i>Ctenotus ingrami</i>	LC										
Zigzag Velvet Gecko	<i>Amalosia rhombifer</i>	LC										

¹ Status:

NC Act: V = Vulnerable, SLC = Special least concern

Biosecurity Act: RI = Restricted invasive

* = exotic

TS = Trap Site; Supp = Supplementary Site; WP = Water Point; as = Active Search; cp = Call Playback; el = Elliot Trap; pf = Pitfall; sc = Scats; sp = Spotlight; tt = Track, scratch or digging; x = Present

Table F6: Microchiropteran bats identified in the project site during seasonal surveys (April 2019 and 2021) – Harp trap, Supplementary and Anabat sites

Common Name	Scientific Name	NC Act Status	Harp trap sites					TS5	Supplementary sites						Ananbat sites										
			H2	H3	H4	H5	H6		Supp 24	Supp 26	Supp 27	Supp 31	Supp 32	Supp 10	AB 14 (GLE)	AB 15 (GLE)	AB 16 (GLE)	AB 17 (GLE)	AB 18 (GLE)	AB 19 (GLE)	AB 20 (GLE)	AB 21 (GLE)	AB 22 (GLE)	AB3	
Chocolate Wattled Bat	<i>Chalinolobus morio</i>	LC			2												□		□						
Eastern Bent-winged Bat	<i>Miniopterus orianae</i>	LC													◆		□	◆	◆	◆	◆	□	□		
Eastern Cave Bat	<i>Vespadelus trouhoni</i>	LC														◆	□		□						
Eastern Horse-shoe Bat	<i>Rhinolophus megaphyllus</i>	LC													◆	◆						◆			
Free-tailed Bat	<i>Ozimops halli</i> / <i>Ozimops ridei</i>	LC													□	◆	◆	◆	◆	□	◆	◆		□	
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>	LC			1										◆	◆	◆	◆	◆	◆	◆	□	□	◆	
Hairy-nosed Freetail Bat	<i>Setirostris eleryi</i>	LC														◆	◆	◆	◆	□	◆	◆	□	◆	
Hoary Wattled Bat	<i>Chalinolobus nigrogriseus</i>	LC			9										□	□	□	□	□	□	□		□	◆	
Inland Broad-nosed Bat	<i>Scotorepens balstoni</i>	LC			2										◆	◆	◆							◆	
Inland Forest Bat	<i>Vespadelus bravastocki</i>	LC													◆	◆	◆	◆		◆	◆	□	◆	◆	
Inland Free-tailed Bat	<i>Ozimops petersi</i>	LC													◆	◆	◆	◆		◆	◆		◆	◆	
Lesser Long-eared Bat	<i>Nyctophilus geoffroyi</i>	LC			2																				
Little Broad-nosed Bat	<i>Scotorepens greyii</i>	LC													◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	
Little Pied Bat	<i>Chalinolobus picatus</i>	LC													□	□	□	□		□		□			
Long-eared Bat	<i>Nyctophilus sp.</i>	LC													◆	◆	◆	◆	□	◆	◆	□		◆	
Northern Broad-nosed bat	<i>Scotorepens sanborni</i>	LC																						◆	
Northern Freetail Bat	<i>Chaerephon jobensis</i>	LC													◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	
Northern Free-tailed Bat	<i>Ozimops lumsdenae</i>	LC													◆	◆	◆	◆	□	◆	◆	◆	◆		
Troughton's Sheath-tailed Bat	<i>Taphozous trouhoni</i>	LC													◆		□	□	◆	◆	□	◆	□	□	
Yellow-bellied Sheath-tailed Bat	<i>Saccolaimus flaviventris</i>	LC						h	h	h	h	h	h	(sp)	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	

NC Act Status = LC = Least concern

◆ = at least one call from the site was attributed unequivocally to the species; □ = calls similar to those of the species were recorded, but could not be reliably identified; h = species heard; sp = spotlight

Appendix G

Significance assessments

Significance assessments

Assessments of the significance of residual impacts from the project have been undertaken for the following MSES:

- regulated watercourse vegetation (Section G1)
- protected wildlife habitat – habitat for the vulnerable *Drummondita calida* (Section G2)
- protected Wildlife habitat – habitat for the special least concern Short-beaked Echidna (Section G2)
- connectivity areas (Section G3).

These impact assessments consider the impact, avoidance, impact mitigation and management measures described in Section 5. The assessments consider both direct and indirect impacts of the project, and were undertaken in accordance with the Queensland SRI Guidelines (EHP 2014b). Guidelines and policies produced by the Queensland and Commonwealth Governments have been referred to, where available, to assist with determining the significance of impacts.

G1. Regulated watercourse REs

Regulated watercourse REs are mapped within the project site (Figure 7) and comprise a range of REs.

As outlined in Section 4.1.3, Appendix 3 of the QEOP lists the defined distances for determining MSES – watercourse REs in non-coastal bioregions and sub-regions, including in the Gilberton Plateau and Claraville Plains subregions, in which the project site is located. The defined distances are:

- stream order 1 or 2 = 25 m from the defining bank
- stream order 3 or 4 = 50 m from the defining bank
- stream order 5 or greater = 100 m from the defining bank.

With reference to Table 1 of the SRI Guideline, which provides criteria for regulated vegetation, a significant residual impact will result to regulated vegetation as a result of:

- clearing of greater than 2.0 ha within the defined distance to the watercourse for sparse communities,
- clearing of greater than 5.0 ha within the defined distance to the watercourse for grassland communities.

Clearing is proposed within the defined distance of a number of watercourses, including the banks of the Woolgar River. RE 2.3.50a, which occurs in the bed of the Woolgar River, is mapped as part of a mixed polygon within the project site. However, no clearing of the bed of the Woolgar River is proposed. Therefore, all clearing within this mixed polygon has been attributed to RE 2.3.26b, which occurs on the banks of the Woolgar River.

Table G1 outlines the proposed clearing to be undertaken within the defined distances to watercourses for each RE. The areas presented below are an accumulation of multiple areas of impact within each stream order within each RE.

Table G1: Summary of vegetation management watercourse clearing

Watercourse RE	Structural category	Clearing proposed within the defined distance of each watercourse (ha) ¹			
		1st or 2 nd order	3rd or 4 th order	5th order or greater	Total ²
2.3.21j	Sparse	1.5	4.4	1.6	7.6
2.3.26b	Sparse	5.9	6.8	1.5	14.1
2.3.40	Sparse	3.6	1.9	1.9	7.3
2.3.41	Woody grassland	2.2	0.5	0.0	2.7
2.3.50a*	Other	0.0	0.0	0.0	0.0
2.5.9	Sparse	2.1	0.1	0.0	2.2
2.7.2a	Sparse	0.9	0.04	0.0	0.9
2.10.1a	Sparse	0.2	0.3	0.0	0.5
2.10.2x5a	Sparse	0.8	0.0	0.0	0.8
2.10.4	Sparse	0.8	0.0	0.0	0.8
2.10.13	Very sparse	0	0.0	0.0	0.0
2.11.1c	Sparse	5.0	0.4	0.0	5.4

¹ Mapping of the defining banks is only available for the Woolgar River within the project site. Therefore, the vegetation management watercourse centreline has been used to develop buffers for 1st, 2nd and 3rd order streams.

² The total is the calculated sum of the area of impact within each polygon of the RE and rounded to one decimal place for the highest accuracy. For this reason the total may differ from calculated total of the values presented in 3rd, 4th, and 5th columns of this table.

Bold indicates clearing that exceeds the sparse structural category clearing threshold of 2 ha or the grassland structural category of 5 ha in accordance with the Queensland SRI Guideline for regulated watercourse vegetation.

* RE 2.3.50a is mapped as part of a mixed polygon within the project site. However, no clearing of the bed of the Woolgar River (i.e. where this community occurs) is proposed. Therefore, all clearing within this mixed polygon has been attributed to RE 2.3.26b, which occurs on the banks of the Woolgar River.

Table G1 indicates that the clearing threshold of 2 ha for sparse communities is exceeded for REs 2.3.21j, 2.3.26b, 2.3.40, 2.5.9 and 2.11.1c. Clearing of all other REs along each watercourse is below the 2 ha threshold for a sparse RE or the 5 ha threshold for a grassland RE (2.3.41). The project is therefore expected to have a significant residual impact on REs 2.3.21j, 2.3.26b, 2.3.40, 2.5.9 and 2.11.1c within the defined distance of a watercourse. Offsets are therefore required for significant residual impacts within vegetation management watercourses. Environmental offsets are discussed in Section 5.1.3.

G2. Protected wildlife

Drummondita calida

NC Act Status: Vulnerable

Likelihood to occur in the project site: MODERATE (Refer Appendix D)

This species was not recorded in the project site, however, is considered to potentially occur as suitable habitat is present and the species is known from the region. However, this shrub is relatively easily detectable and for this reason it is considered to have only a moderate likelihood of being present within sandstone scarp woodland (RE 2.10.2x5a) habitat in the north-east of the project site and is highly unlikely to occur within the proposed project footprint as detailed targeted searches were conducted in this area for threatened and near threatened species.

The project site contains 140.9 ha of potentially suitable habitat and the project will involve disturbance to 13.8 ha.

Current known threats

There is no published information about threats specific to this species.

Management plans

There are no published threat abatement plans, recovery plans or management plans for this species.

Significance of impacts

Table G2 provides an assessment of the significance of impacts to *Drummondita calida* against the Queensland SRI guideline for protected wildlife habitat.

Table G2: Assessment of significance of impacts for *Drummondita calida*

Significance criteria	Assessment of significance
An action is likely to have a significant impact on vulnerable wildlife habitat if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population; or	<i>Drummondita calida</i> was not recorded during field surveys, therefore, a population of this species has not been identified within the project site. 13.8 ha of potential habitat for this species will be cleared as part of the project, while the majority of habitat, i.e. 127.1 ha, will be retained and similar habitat is likely to occur extensively in the Gregory Range. Furthermore, this species is unlikely to occur in the project footprint. Therefore, this clearing is unlikely to lead to a long-term decrease in the size of a local population.
Reduce the extent of occurrence of the species; or	The removal of 13.8 ha of potential habitat for this species, is considered unlikely to affect the ability of the species to persist in the local area. This is because no individuals of this species are proposed to be disturbed, and there is extensive similar potential habitat within the Gregory Range to the north-east and east, in which this species can persist or colonise, including 127.1 ha within the project site.

Significance criteria	Assessment of significance
An action is likely to have a significant impact on vulnerable wildlife habitat if the impact on the habitat is likely to:	
fragment an existing population; or	<i>Drummondita calida</i> was not recorded during field surveys, and a population of this species is unlikely to occur within the proposed project footprint. Therefore, a population will not be fragmented. Connectivity of habitat will not be compromised as a result of the project to the extent that habitat will remain adjacent to impacted areas within and adjacent to the project site.
result in genetically distinct populations forming as a result of habitat isolation; or	As a local population is unlikely to be fragmented or become isolated, the gene flow within any local population is unlikely to be affected by the project. The clearing of potential habitat is not substantial enough to result in this type of impact.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat; or	The region has a history of minor disturbance and cattle grazing and as a result introduced plants and restricted invasive species are present. These types of invasive species will continue to be present within and surrounding the project site during the life of the mine. The alluvial communities are most susceptible to weed invasion due to the moisture availability and dispersal of seeds during flow. In contrast, the sandstone habitats in the north-east of the project site, which provide potential habitat for this species, support low levels of weed incursion and are less susceptible to future weed invasion. Therefore, invasive species that would be harmful to <i>Drummondita calida</i> , are unlikely to become established in potential habitat for this species. Nonetheless, management plans will be implemented for weed control as part of the project to ensure new weed species are not introduced and the distribution of existing weed species is not increased as a result of the project.
introduce disease that may cause the population to decline, or	Disease is not a known threat to this species. Therefore, the potential habitat clearing is unlikely to introduce disease that may cause decline of a <i>Drummondita calida</i> population.
interfere with the recovery of the species; or	Given this species has only a moderate likelihood to occur in the project site, and unlikely to occur in the proposed project footprint, and the majority of potential habitat will be retained and potential habitat occurs elsewhere in the Gregory Range, it is unlikely the project will interfere with the recovery of this species.
cause disruption to ecologically significant locations (breeding, feeding, nesting migration or resting sites) of a species.	No populations of this species were identified during the field survey and if present this species is unlikely to be present as a large or significant population, as this would have been detected. As such, the project site is unlikely to support an ecologically significant location for this species, particularly as it is on the far western edge of the Gregory Range, in which greater expanses of habitat are likely to be present. Therefore, the project is unlikely to cause disruption to an ecological significant location of this species.

Significance criteria	Assessment of significance
An action is likely to have a significant impact on vulnerable wildlife habitat if the impact on the habitat is likely to:	
Conclusion: <i>Although 13.8 ha of potential habitat is proposed to be cleared for the project, this habitat is not particularly significant in the landscape and substantial similar areas will remain in the project site and elsewhere in the region. Furthermore, no individuals were identified during the seasonal surveys and it is unlikely this species occurs in the proposed project footprint as this area was searched for threatened and near threatened species. Therefore, the project is unlikely to significantly impact a population of this species.</i>	

Short-beaked echidna

NC Act Status: Special least concern

Presence in the project site: PRESENT (Refer Appendix D)

This species was recorded at three locations in the project site (Figure 9). This species occurs in a wide range of habitats including cleared, grazing land and is likely to occur in all habitats in the project site due to the presence of intact remnant communities throughout the project site as these areas provide foraging resources such as hollow logs and leaf litter.

The project site contains 2,280.7 ha of foraging habitat for this species. The project will involve disturbance to 1,340.6 ha of habitat for this species.

Current known threats

The likely predators of the Short-beaked Echidna are Feral Cats, European Red Fox, Wild Dogs and Goannas (NPWS 1999).

Management plans

There are no published threat abatement plans, recovery or management plans for this species and it is not considered a threatened or at risk species.

Significance of impacts

Table G3 provides an assessment of the significance of impact to the Short-beaked Echidna against the Queensland SRI guideline for protected wildlife habitat.

Table G3: Assessment of significance of impacts for Short-beaked Echidna

Significance criteria	Assessment of significance
An action is likely to have a significant impact on a special least concern (non-migratory) animal wildlife habitat if it is likely that it will result in:	
a long-term decrease in the size of a local population; or	1,340.6 ha of habitat for this species will be cleared as part of the project. Short-beaked Echidna habitat is widespread in the region and this species occupies a broad range of habitats of varying quality. Therefore, this clearing is unlikely to lead to a long-term decrease in the size of the local population.

Significance criteria	Assessment of significance
An action is likely to have a significant impact on a special least concern (non-migratory) animal wildlife habitat if it is likely that it will result in:	
a reduced extent of occurrence of the species; or	Short-beaked Echidna habitat is proposed to be cleared as part of the project. However, the removal of 1,340.6 ha of habitat, is considered unlikely to affect the ability of the species to persist in the local area. Therefore, the extent of occurrence of this species will not be reduced as a result of the project. It is noted that the long-term survival of this widespread and relatively common species is currently secure and it's listing as special least concern under the NC Act is only a reflection of its iconic status rather than it being at risk in the wild.
fragmentation of an existing population; or	Connectivity of habitat will not be compromised as a result of the project to the extent that the local Short-beaked Echidna population would become fragmented. Riparian vegetation associated with the Woolgar River will be retained and would continue to act as a movement corridor this this highly mobile species that is also known to traverse disturbed habitats.
result in genetically distinct populations forming as a result of habitat isolation; or	As the local population is unlikely to be fragmented or become isolated, the gene flow within the local population is unlikely to be affected by the project.
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.	Standard industry recognised measures will be employed during the vegetation clearing stages of the project to minimise harm and disruption to animals and breeding places in accordance with the requirements of the NC Act. This will reduce the risk and extent of disruption to the breeding cycle of Short-beaked Echidnas in the project site. Additionally, connectivity of habitat will not be severed and Short-beaked Echidnas will be able to continue to move through the landscape and forage in extensive surrounding habitat areas.
Conclusion: <i>Although 1,340.6 ha of Short-beaked Echidna habitat is proposed to be cleared for the project, this habitat is not particularly significant in the landscape and substantial similar areas remain in the region. This in combination with the mobility of the species and maintenance of connectivity with surrounding areas, makes it unlikely that the project will have a significant residual impact on the Short-beaked Echidna.</i>	

G3. Connectivity areas

As discussed in Section 4.2.4, remnant vegetation in the project site is considered to be a connectivity area as defined under the EO Act. 1,340.6 ha of remnant vegetation will be impacted by the project.

The DES LFC Tool was used to assist in identifying and quantifying any significant impact as a result of the changes to the landscape connectivity as a result of the project, using the vegetation mapping. The LFC Tool determined that the project

will not result in a significant impact on connectivity areas. The output of this assessment is provided in Appendix H.

Appendix H

Landscape Fragmentation and Connectivity Tool Output

Department of Environment and Heritage Protection (DEHP)

Landscape Fragmentation and Connectivity (LFC) Tool version 1.4 LOGFILE

Process started at 01-03-2022 01:27:58 PM

Python version: 2.7.14 (v2.7.14:84471935ed, Sep 16 2017, 20:19:30) [MSC
v.1500 32 bit (Intel)]

Arcpy version: 10.6

Username: carte

INPUT PARAMETERS

Output Workspace: H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN

CALCS\20220301 - LFC TOOL\OUTPUT_ADJUSTED

Threshold lookup table: L:\DATABASE\12 - QLD DATA - LFC

TOOL\LFC_data.gdb\tbl_Regional_frag_local_threshold

Remnant cover layer: H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN

CALCS\20220301 - LFC TOOL\WORKING\RVM VEGETATION CLIP ERASE.shp

Remnant cover layer edited: False

Regional buffer extent: 20 kilometres

Local buffer extent: 5 kilometres

Impact layer: H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN

CALCS\20220301 - LFC TOOL\DISTURBANCE AREA\BVS_DISTURBANCE

AREA_FINAL.shp

layer projection: GDA_1994_MGA_Zone_54

Raster cell resolution for analysis: 10 metres

Edge Width: 50 metres

(The distance from non-remnant landscapes through to the core ecosystem - the
edge of remnant ecosystems)

Default projection: L:\DATABASE\12 - QLD DATA - LFC TOOL\scripts\QLD Albers
Equal Area Conic.prj

13:27:58 Checking out the spatial analyst tool - required for LFC

13:27:58 _____BEGINNING LANDSCAPE FRAGMENTATION AND
CONNECTIVITY ANALYSIS_____

13:27:58 This tool will categorise the landscape into:
{0: 'non-rem', 1: 'patch', 2: 'edge', 3: 'perforated', 4: 'core (< 100 hectares)',
5: 'core (100-500 hectares)', 6: 'core (> 500 hectares)', 7: 'water'}

13:28:35 H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN
CALCS\20220301 - LFC TOOL\OUTPUT_ADJUSTED\lyr_file does not exist,
creating it now.

13:28:35 Copying across impact site feature(s) and calculating area in
hectares (AreaHA)

13:28:43 Making a local copy of the impact site

13:28:48 Preparing remnant cover layer for analysis

13:28:52 Created regional scale buffer of 20 kilometres

13:28:56 Created local scale buffer of 5 kilometres

13:29:07 Clipped the remnant cover to the regional buffer extent

13:29:10 Unioned the pre impact remnant layer with the impact site

13:29:13 Attributed the impact area as not RVM Cat B

13:29:13 Area of RVM Cat B clearing is 1339.78 hectares

13:29:13 SQL selection used is "RVM_CAT" = 'B' and "Cover" = 'Not RVM Cat
B' on shapefile

H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN CALCS\20220301 - LFC
TOOL\OUTPUT_ADJUSTED\main_output\clip_remcover_post.shp

13:29:15 Categorised the cover attributes in clip_remcover_pre.shp ready for
raster conversion

13:30:23 Converted clip_remcover_pre.shp to raster

13:30:28 Categorised the cover attributes in clip_remcover_post.shp ready
for raster conversion

13:31:45 Converted clip_remcover_post.shp to raster

13:31:45 Run Landscape fragmentation analysis on the pre impact regional
landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 25.2 MINUTES)

13:57:03 Run Landscape fragmentation analysis on the post impact regional landscape

REGULATED VEGETATION TYPES BEING EXTRACTED FROM LAND COVER
IDENTIFICATION OF CORE, PATCH, EDGE AND PERFORATIONS
COMBINING FRAGMENTATION CLASSES
CLASSIFYING CORE FOREST PATCHES BY AREA
COMPOSING FINAL FRAGMENTATION MAP
COMPOSING FINAL FRAGMENTATION MAP
(FRAGMENTATION CALCULATION TIME WAS 25.5 MINUTES)

Extracting a local subset of lfc_regional_pre_impact
Extracting a local subset of lfc_regional_post_impact

Collating pre and post impact statistics and trigger assessment

14:25:45 Summarising area statistics for: lfc_localmsk_pre_impact
14:25:48 Summarising area statistics for: lfc_localmsk_post_impact
14:25:50 Summarising area statistics for: lfc_regional_pre_impact
14:25:59 Summarising patch count for lfc_localmsk_pre_impact
14:27:19 Summarising patch count for lfc_localmsk_post_impact

Analysing impact on Connectivity Areas

SIGNIFICANCE TEST ONE

The regional total area is 163656.55

The regional extent of core remnant is 162762.86

The regional extent of core remnant is 99.45 percent

This level of regional fragmentation sets a local impact threshold of: 50.0 percent

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

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

Area of core at the local scale (pre impact): 18550.16

Area of core at the local scale (post impact): 17060.24

Percent change of core at the local scale (post impact): 8.03 percent

SIGNIFICANCE TEST TWO

The number of core remnant areas occurring on the site: 1

The number of core remnant areas remaining on the site post impact: 1

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

RESULT

14:30:05 This analysis has determined any impact on connectivity areas is NOT significant

(A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is False)

The significance table has been written to:

..\main_output\lfc_significance_assessment.csv

The local scale summary table has been written to:

..\main_output\lfc_local_scale_summary.csv

The site scale summary table has been written to:

..\main_output\lfc_site_scale_summary.csv

GIS layer files copied into folder \lyr_file within the project folder.

View layers in ArcMAP using..\\H:\2108 BVS GOLD PROJECT\04 - PROJECT DESIGN CALCS\20220301 - LFC

TOOL\OUTPUT_ADJUSTED\lyr_file\lyr_file\Connectivity Area Impact Assessment.lyr

Please scrutinise the output tables and spatial layers to confirm the desktop modelling of connectivity area impact

This analysis used an unedited copy of the Regulated Vegetation layer.

15:18:28 _____COMPLETED LANDSCAPE FRAGMENTATION AND
CONNECTIVITY ANALYSIS_____
