REPORT

Ecology Assessment Report

Q-4225-15-RP-131

Australia Pacific LNG Project

This report provides an overview of the environmental and ecological values for the site contained within Lots 8 and 9 on WV409 and Lot 10 on WV331 associated with DP098.

Revision	Date	Description	Originator	Checked	QA/Eng	Approved
A	28/03/2018	Issued for review	P. Wagner	S. Baker	C. Zappone	L. Merton
B	9/04/2018	Updated for review	P. Wagner	S. Baker	T. Collins	T. Collins
0	13/04/2018	Final	P. Wagner	S. Baker	T. Collins	T. Collins

Uncontrolled when printed unless issued and stamped Controlled Copy.

Release Notice

This document is available through the Australia Pacific LNG Project controlled document system TeamBinder™. The responsibility for ensuring that printed copies remain valid rests with the user. Once printed, this is an uncontrolled document unless issued and stamped Controlled Copy.

Third-party issue can be requested via the Australia Pacific LNG Project Document Control Group.

Document Conventions

The following terms in this document apply:

- **Will**, **shall** or **must** indicate a mandatory course of action
- **Should** indicates a recommended course of action
- **May** or **can** indicate a possible course of action.

Document Custodian

The custodian of this document is the Australia Pacific LNG Project – Manager, Access. The custodian is responsible for maintaining and controlling changes (additions and modifications) to this document and ensuring the stakeholders validate any changes made to this document.

Deviations from Document

Any deviation from this document must be approved by the Australia Pacific LNG Project – Manager, Access.

Table of Contents

1. Introduction 5
1.1. Scope of Works 5
1.2. Definitions & Abbreviations 5
1.2.1. Definitions 5
1.2.2. Abbreviations 6
1.2.3. Document Revision Table 6
1.2.4. Document References 6
2. Site Context 10
3. Methodology 11
3.1. Desktop and Literature Review 11
3.2. Field Survey 12
3.2.1. Vegetation Community Survey 12
3.2.2. Habitat Surveys 12
3.2.3. Threatened Flora and Fauna Survey 12
3.2.4. Exotic Flora and Fauna Survey 13
3.2.5. Survey Limitations 13
4. Results and Discussions 14
4.1. Desktop and Literature Review 14
4.2. Field Survey 14
4.2.1. Commonwealth Environmental Matters 14
4.2.2. Queensland Environmental Matters 35
4.2.3. Disturbance 46
5. Conclusions 47
Appendix A: Site Location and Survey Points 48
Appendix B: Results of EPBC Protected Matters Search Tool 49
Appendix C: Wildlife Online Database Search Results 50
Appendix D: DES Mapped Remnant Regional Ecosystems 51
Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants) 52
Appendix F: List of Flora and Fauna Species Identified on Site 53
Appendix G: Ground Truthed Threatened Ecological Communities 61
Appendix H: Ground Truthed Regional Ecosystems 62
Appendix I: Curriculum vitae 63

List of Tables

Table 1: Definitions 5
Table 2: Abbreviations 6
Table 3: Revision History 6
Table 4: Associated Document References 6
Table 5: Site Context 10
Table 6: Desktop and Literature Review Sources 11
Table 7: Commonwealth Environmental Matters – Field Survey Results 15
Table 8: Key diagnostic characteristics and condition thresholds 16
Table 9: Field survey results for EPBC Act threatened flora 17
Table 10: Field survey results for EPBC Act threatened fauna 20
Table 11: State environmental matters – field survey results 35
Table 12: Ground Truthed Regional Ecosystems 36
Table 13: Ground Truthed Mature Regrowth 37
Table 14: Field survey results for NC Act EVNT flora 39
Table 15: Field survey results for NC Act EVNT fauna 42

Uncontrolled when printed unless issued and stamped Controlled Copy.

1. Introduction

This report provides a description of the ecological values found within Lot 8 and Lot 9 on Plan WV409 and Lot 10 on Plan WV331, collectively herein referred to as 'the site'. The results are based on an initial desktop assessment followed by a field survey to confirm the vegetation communities, flora and fauna species, habitat values and areas of disturbance.

This report has been compiled by E2M Pty Ltd with the field survey conducted by a team of two ecologists led by Peter Wagner. Peter Wagner is a suitably qualified ecologist with over six years' experience undertaking ecological assessments within central and south-east Queensland. Peter's Curriculum vitae is attached in Appendix I: Curriculum vitae.

1.1. Scope of Works

An ecological survey was required to be undertaken throughout the site and associated roadside corridors in anticipation of proposed development. Refer to Appendix A: Site Location and Survey Points for an overview of the site.

1.2. Definitions & Abbreviations

1.2.1. Definitions

Table 1: Definitions

Term	Definition
Likely (with regard to likelihood of occurrence assessment)	Species, population or ecological community could occur as the site contains suitable habitat and the species has been previously recorded in the locality (desktop search extent).
Present (with regard to likelihood of occurrence assessment)	Species, population or ecological community was recorded during the field investigations.
Project	Australia Pacific LNG Project
Ramsar	Convention on Wetlands of International Importance (the Ramsar Convention) was signed in Ramsar, Iran on 2 February 1971. The Ramsar Convention aims to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. The Convention encourages member countries to nominate sites containing representative, rare or unique wetlands, or that are important for conserving biological diversity, to the List of Wetlands of International Importance (Ramsar sites).
Remnant vegetation	In accordance with Neldner *et al.* (2017), woody vegetation of which the ecological dominant layer: • covers approximately 50% of the undisturbed predominant canopy; and • averages more than 70% of the vegetation's undisturbed height; and • is composed of species characteristic of the vegetation's undisturbed predominant canopy.
The site	The area encompassed by the cadastral boundaries of Lot 8 and Lot 9 on Plan WV409 and Lot 10 on Plan WV331.
Potential (with regard to likelihood of occurrence assessment)	Species, population or ecological community may occur as the site contains potential habitat however the species has not been recorded in the locality (desktop search extent) or habitat available is limited, reducing the likelihood of occurrence.

Uncontrolled when printed unless issued and stamped Controlled Copy.

Term	Definition
Unlikely (with regard to likelihood of occurrence assessment)	Species, population or ecological community is not likely to occur. Lack of previous recent (<25 years) records and suitable potential habitat limited or not available in the study area.

1.2.2. Abbreviations

The following abbreviates are found throughout this report.

Table 2: Abbreviations

Abbreviation	Description
CE	Critically Endangered
DES	(Queensland) Department of Environment and Science
DotEE	(Commonwealth) Department of Environment and Energy
E	Endangered
EPBC Act	Commonwealth *Environment Protection and Biodiversity Act 1999*
ESA	Environmentally Sensitive Area
GTRE	Ground-truthed Regional Ecosystem
MNES	Matter of National Environmental Significance under the EPBC Act
NC Act	(Queensland) *Nature Conservation Act 1992*
NT	Near Threatened
RE	Regional Ecosystem
REDD	Regional Ecosystem Description Database
SLC	Special Least Concern
SO	Stream Order
TEC	Threatened Ecological Community under the EPBC Act
V	Vulnerable
WoNS	Weed of National Significance

1.2.3. Document Revision Table

Table 3: Revision History

Revision	Date	Description
A	28/03/2018	Issued for review
B	09/04/2016	Updated for review
0	13/04/2016	Final

1.2.4. Document References

The following documents are referred to throughout this report.

Table 4: Associated Document References

Document Number	Title
Q-LNG01-15-MP-0109	Australian Pacific LNG (2011) *Environmental Constraints Planning and Field Development Protocol*.
	Blakers, M., Davies, S. J. and Reilly, P. N. (1984). *The Atlas of Australian Birds*. Melbourne University Press, Melbourne.
	Brigalow Belt Reptiles Workshop (2010). *Proceedings from the workshop for the nine listed reptiles of the Brigalow Belt bioregions*. Queensland Herbarium, Brisbane.
	Bruton, M., McAlpine, C., Smith, A. and Franklin, C. (2014). The importance of underground shelter resources for reptiles in dryland landscapes: A woma python case study. *Austral Ecology* **39**:819-829.
	Bureau of Meteorology (BoM) (2018). *Climate data online*. Australian Government, Canberra. Available at: http://www.bom.gov.au/climate/data/ (Accessed 20 March 2018)
	Department of Environment and Heritage Protection (2016). *Flora Survey Guidelines - Protected Plants*. Department of Environment and Heritage Protection, Brisbane.
	Department of Environment and Science (DES) (2013) Environmental Protection Act 1994 Mature Regrowth. DES, Brisbane.
	Department of Environment and Science (DES) (2014). *Maps of Environmentally Sensitive Areas*. Available at: https://www.ehp.qld.gov.au/licences-permits/maps_of_environmentally_sensitive_areas.php (Accessed 23 January 2018).
	Department of Environment and Science (DES) (2015). *Pre-clearing or Remnant Regional Ecosystem Map*. Available at: https://environment.ehp.qld.gov.au/map-request/re-broad-veg-group/ (Accessed 23 January 2018).
	Department of Environment and Science (DES) (2016). *Protected Plants Flora Survey Trigger Map*. Available at: https://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php (Accessed 25 March 2018).
	Department of Environment and Science (DES) (2017). *Map Request Form - Referable Wetlands*. Available at: https://www.ehp.qld.gov.au/ecosystems/wetlands/referable-wetlands-form.php (Accessed 23 January 2018).
	Department of Environment and Science (DES) (2017). *Wildlife Online: Request a Species List*. Available at: https://environment.ehp.qld.gov.au/report-request/species-list/ (Accessed 23 January 2018).
	Department of Environment and Science (DES) (2018a). *Regional Ecosystem Technical Description: Brigalow Belt*. Queensland Herbarium, Brisbane.
	Department of Environment and Science (DES) (2018b). *Rutidosis lanata, WetlandInfo*. Available at: https://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/components/species/?rutidosis-lanata (Accessed 23 March 2018).
	Department of Environment and Science (DES) (2018c). *Acacia wardellii, WetlandInfo*. Available at: https://wetlandinfo.ehp.qld.gov.au/wetlands/ecology/components/species/?acacia-wardellii (Accessed 23 March 2018).
	Department of Environment, Land, Water and Planning (2016). *National Recovery Plan for the Spotted-tailed Quoll Dasyurus maculatus*. Australian Government, Canberra.
	Department of the Environment (DotE) (2013a). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community*. Department of the Environment, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservation-advice.pdf (Accessed 23 March 2018)
	Department of the Environment (DotE) (2013b). *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*. Department of the Environment, Canberra.
	Department of the Environment (DotE) (2014). *Conservation Advice Elseya albagula White-throated snapping turtle*. Department of the Environment, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/81648-conservation-advice.pdf (Accessed 23 March 2018).
	Department of the Environment (DotE) (2015). *Conservation Advice Grantiella picta painted honeyeater*. Department of the Environment, Canberra. Available at:

Document Number	Title
	http://www.environment.gov.au/biodiversity/threatened/species/pubs/470-conservation-advice.pdf (Accessed 23 March 2018).
	Department of the Environment and Energy (DotEE). *Species Profiles and Threats Database*. Available at: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl (Accessed 23 March 2018).
	Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008a). *Approved Conservation Advice for Tylophora linearis*. Department of the Environment, Water, Heritage and the Arts, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/55231-conservation-advice.pdf (Accessed 23 March 2018).
	Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008b). *Approved Conservation Advice for Dichanthium setosum*. Department of the Environment, Water, Heritage and the Arts, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/14159-conservation-advice.pdf (Accessed 23 March 2018).
	Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008c). *Approved Conservation Advice for Homopholis belsonii*. Department of the Environment, Water, Heritage and the Arts, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/2406-conservation-advice.pdf (Accessed 23 March 2018).
	Glossy Black Conservancy (2010). *Glossy black-cockatoo Conservation Guidelines for South-Eastern Queensland and far North-Eastern New South Wales*. Glossy Black Conservancy.
	Higgins, P. J. (ed.) (1999). *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 4. Oxford University Press, Melbourne.
	Higgins, P. J., Peter, J. M and Cowling, S. J. (2006). *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 7. Oxford University Press, Melbourne.
	Higgins, P. J. and Davies, S. J. (eds) (1996). *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 3. Oxford University Press, Melbourne.
	Krockenberger, M. (2012). *Cryptococcosis in koalas. In: Diagnostic Pathology of the Diseases of Aquatic, Aerial and Terrestrial Wildlife*. Wildlife Pathology Short Course, Sydney.
	Lindsey, T. R. (1992). *Encyclopedia of Australian Animals: Birds*. Collins-Angus and Robertson Publishers Pty Ltd, Pymble.
	Marchant, S. and Higgins, P.J. (eds.) (1993). *Handbook of Australian, New Zealand and Antarctic Birds. Volume 2 - Raptors to Lapwings*. Oxford University Press, Melbourne.
	Menkhorst, P. and Knight, F. (2011). *A Field Guide to the Mammals of Australia*. Oxford Publishing, Sydney.
	Neldner, V. J., Wilson, B. A., Dillewaard, H. A., Ryan, T. S. and Butler, D. W. (2017). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland*. Version 4.0. Queensland Herbarium, Queensland Department of Science, Information Technology and Innovation, Brisbane.
	NSW Office of Environment and Heritage (OEH) (2017). *Painted Honeyeater Profile*. Available at: http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10357 (Accessed 23 March 2018).
	Queensland Herbarium (2018). *Regional Ecosystem Description Database (REDD)*. Version 10.1. Department of Environment and Science, Brisbane.
	Sattler, P.S. and Williams, R.D. (eds) (1999). *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.
	Specht, R. L. (1970) Vegetation. In: *The Australian Environment*. Ed. Leeper, G. W. CSIRO Melbourne University Press, Melbourne.
	Threatened Species Scientific Committee (TSSC) (2015). *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat*. Canberra: Department of the Environment. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/83395-conservation_advice-01102015.pdf (Accessed 23 March 2018).

Document Number	Title
	Threatened Species Scientific Committee (TSSC) (2016). *Conservation Advice Petauroides volans greater glider*. Department of the Environment, Canberra. Available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf (Accessed 23 March 2018).
	Traill, B. J., Collins, E., Peake, P. and Jessup, S. (1996). Current and past status of the birds of Chiltern- a Box-Ironbark forest in north-eastern Victoria. *Australian Bird Watcher* **16**:309-326.
	Watkins, D. (1993). A national plan for shorebird conservation in Australia. *RAOU Report Series* **90**.
	Wilson S, and Swan G. (2010). *A complete guide to reptiles of Australia*. New Holland Publishers, Sydney.
	Wilson, P.R. and Taylor, P.M. (2012). *Land Zones of Queensland*. Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.

2. Site Context

Table 5: Site Context

Bioregion	The site is located within the Southern Downs subregion of Brigalow Belt South Bioregion (Bioregion 11). This subregion is located on predominantly Jurassic and Cretaceous sediments that form outcrops around the Great Artesian Basin. The underlying geology has formed a low, hilly landscape with areas of clay plains in the southern extent and small areas of Tertiary volcanics. The vegetation consists predominantly of *Casuarina cristata* (belah), *Acacia harpophylla* (brigalow), *Eucalyptus populnea* (poplar box) and *E. crebra* (narrow-leaved ironbark) communities. Other vegetation communities include *Corymbia citriodora* (spotted gum), *E. fibrosa* subsp. n*ubila* (broad-leaved ironbark) and semi-evergreen vine thicket, *Astrebla* and *Acacia* communities (Sattler and Williams, 1999).
Climate	The Yuleba Garden Street weather station (43043), located 27 km south of the site, has a mean annual rainfall of 614 mm, falling predominantly in the summer months. The average annual maximum temperature at Roma is 28˚C, with January being the hottest month (average maximum temperature of 34.4˚C) and July being the coldest month (average maximum temperature of 20.3˚C) (BoM, 2018). The region had received above average rainfall, approx. 115 mm, of rain in the month prior to the survey. Weather conditions during the survey were clear and sunny with daily temperatures ranging between 13.9˚C and 30˚C (BoM, 2018).
Current land use	The site comprised a combination of cleared improved pastureland and retained woody vegetation. Areas of woody vegetation contained both remnant and regrowth vegetation communities. Evidence of selective thinning was observed within the southern extent of the site. Cleared areas were likely to have been utilised for stock agistment in the past. The site was not under active management at the time of the survey, with no livestock present. A homestead is located within the north-west corner of Lot 8 on Plan WV409.
Soils and geology	Geoscience Australia (Roma map sheet SG5512) identifies the underlying geology of the site is located on lower Cretaceous Mooga sandstone and Bungil Formation as well as Tertiary surfaces. The Mooga sandstone and Tertiary surfaces are characterised by quartzose to labile sandstone and conglomerates. These areas contained deep sandy soils (colluvial) resulting from the erosion of surrounding Tertiary surfaces, consistent with Land Zone 5 (Wilson and Taylor, 2012). The erosion of Tertiary surfaces has resulted in a number of alluvial landforms in association with watercourses within the site. These areas were consistent with Land Zone 3. The Bungil Formation contains sandstone, siltstone and mudstone. The degree of weathering within these areas varies, with some areas with relatively shallow soils (Land Zone 7) grading into deeper soils (Land Zone 5) (Wilson and Taylor, 2012).

3. Methodology

The methodology employed in compilation of this Ecological Assessment Report consisted of:

- a desktop and literature review of ecological databases and literature sources as direct references for the survey undertaken
- a field survey of the site

An explanation of these activities is outlined in this section.

3.1. Desktop and Literature Review

Sources utilised in the desktop and literature review are listed in Table 6 below.

Table 6: Desktop and Literature Review Sources

Database	Co-ordinates or search area	Date of search	Appendix
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool	Latitude: -26.3839 Longitude: 149.4991	23/01/2018	Appendix B: Results of EPBC Protected Matters Search Tool
Nature Conservation Act 1992 (NC Act) Protected Species Lists Wildlife Online Database	Latitude: -26.3839 Longitude: 149.4997	23/01/2018	Appendix C: Wildlife Online Database Search Results
Department of Environment and Science (DES) Remnant Regional Ecosystem Map	Latitude: -26.3839 Longitude: 149.4997	25/03/2018	Appendix D: DES Mapped Remnant Regional Ecosystems
DES Map of Environmentally Sensitive Areas	Latitude: -26.3839 Longitude: 149.4997	23/01/2018	Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants)
DES Map of Referable Wetlands and Wetland Protection Areas	Lot 8 on Plan WV409 Lot 10 on Plan WV331	23/01/2018	Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants)
DES Protected Plants Flora Survey Trigger Map	Lot 8 on Plan WV409 Lot 10 on Plan WV331	25/03/2018	Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants)
Queensland Geological Mapping, Roma Map Sheet SG5512, 1:250,000 Geological Series	Roma Map Sheet SG5512	N/A	N/A

Data searches were conducted using a 20 km buffer around the coordinate -26.3839; 149.4997 which corresponds to the approximate centre point of the site.

3.2. Field Survey

Ecological surveys were conducted in accordance with:

- The *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.*, 2017)
- In line with the methodology described in the *Environmental Constraints Planning and Field Development Protocol* (Q-LNG01-15-MP-0109, Australia Pacific LNG 2011).

Field surveys were undertaken between 13 to 15 March 2018.

3.2.1. Vegetation Community Survey

Baseline botanical surveys were undertaken to describe dominant flora and vegetation community structure throughout the site. Botanical surveys were consistent with the quaternary level of data collection as described in Neldner *et al.* (2017).

The vegetation community surveys were undertaken within 50 m x 10 m plots for the purpose of typifying the vegetation community under assessment. Vegetation community data was entered into Trimble Global Positioning System (GPS) devices loaded with a purpose 'built' data capture system. A total of 51 formal vegetation community surveys were undertaken within the site. Ground-truthing of the DES RE designation (DES, 2015) throughout the site were undertaken via quaternary level and random meander transect assessments, as defined by Neldner *et al.* (2017).

The locations of the vegetation community survey sites are presented in Appendix A: Site Location and Survey Points. Heights (m), percentage cover and species composition data was collected for each stratum within the community. Representative photo(s) were also taken of the subject vegetation community.

Vegetation community polygons were verified to a single homogenous Regional Ecosystem (biodiversity status) in accordance with *Regional Ecosystem Description Database* (REDD) (Queensland Herbarium, 2018). In instances where strata height data was unavailable for a particular RE, information provided in the *Regional Ecosystem Technical Descriptions for the Brigalow Belt* (DES, 2018a) and vegetation formations defined by Specht (1970) were used. EPBC Act threatened ecological communities (TECs) were mapped based on threshold criteria identified within available listing advice for the community (DotEE, 2018).

3.2.2. Habitat Surveys

Habitat surveys were undertaken in conjunction with most vegetation community surveys within the 50 m x 10 m plot. A total of 26 formal habitat surveys were undertaken across the site (Appendix A: Site Location and Survey Points).

Within each habitat survey, a range of landscape and microhabitat features were scored (1-3) to assist in determining habitat values for native fauna. Representative photo(s) were also taken of the given habitat patches. Microhabitat features assessed included:

- patch size
- connectivity to surrounding remnant communities
- tree hollows (<50 mm; 50-100 mm and >100 mm)
- decorticating bark
- leaf litter
- ground cover (live vegetation)
- rocks
- cracking clays
- gilgai
- logs; and
- water sources

3.2.3. Threatened Flora and Fauna Survey

Threat-listed species are those listed under the EPBC Act and the *Nature Conservation (Wildlife) Regulation 2006*.

Fauna species were recorded opportunistically throughout the site. Targeted threat-listed flora searches were undertaken for species highlighted by the database and literature review. Searches undertaken were based on:

- incidental field observations of high quality habitat
- the identification of distinct ecological features through the preliminary desktop and literature review; or
- the vicinity of a vegetation community survey/habitat feature plots where field ecologists deemed the given area to be of sufficient value to a threatened species to warrant such a search.

Any observations of threatened species (whether within search areas or opportunistically) were recorded using the Trimble GPS device. Where practicable, photo(s) were taken of the subject threatened species. Any flora specimens deemed as potential threatened species and not conclusively identified by the ecologists were forwarded to the Queensland Herbarium for verification.

3.2.4. Exotic Flora and Fauna Survey

Presence and abundance of flora and fauna species listed as Prohibited and/or Restricted Matter under the *Biosecurity Act 2014* (Schedules 1 and 2), were recorded at the time of the survey both within survey plots and opportunistically while traversing the site. Exotic flora and fauna species were entered into the Trimble GPS devices.

3.2.5. Survey Limitations

A number of factors are considered likely to influence survey results for particular species or species groups. These factors are:

- Timing (seasons) and duration of the survey period
- Weather conditions in the preceding seasons and immediately prior to the survey; and/or
- Restricted spatial area of the habitats within the site.

Due to the above-listed items, the surveys undertaken may not provide a true indication of seasonal habitat utilisation by fauna species within the site. Some cryptic flora species may only be detected during particular flowering periods. Recent rainfall preceding the field survey resulted in generally favourable conditions, with the emergence of a number of annual herbs and grasses with the presence of reproductive material. The field investigations undertaken were also limited to passive techniques (e.g. no live trapping). Additional survey effort would be required to provide a more comprehensive inventory of species, both threatened and common.

4. Results and Discussions

This section includes the results of the database and literature review. Some information is contained in the appendices and is referenced below.

4.1. Desktop and Literature Review

Results of the desktop and literature review can be found in Appendices B-E, as listed in Table 6.

4.2. Field Survey

Results of field surveys are detailed in the following sections. A comprehensive list of flora and fauna species identified during the field survey is included in Appendix F: List of Flora and Fauna Species Identified on Site.

4.2.1. Commonwealth Environmental Matters

Field survey results for Commonwealth environmental matters (Matters of National Environmental Significance (MNES), TECs, threat-listed species) are outlined in Table 7.

Table 7: Commonwealth Environmental Matters – Field Survey Results

Commonwealth environmental matters	Present (Y/N)	Location	Description	Status	Condition	Comments
TECs	Y		Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Remnant patches contained minimal infestations of introduced species.	Refer to section 4.2.1.1.
EPBC Act threat-listed flora	N	-	-	-	N/A	Refer to section 4.2.1.2.
EPBC Act threat-listed fauna	N	-	-	-	N/A	Refer to section 4.2.1.3.
Migratory species	N	-	-	N/A	N/A	Refer to section 4.2.1.4.
Marine species	Y	Observed opportunistically throughout the site	Three EPBC Act marine species were recorded including: • *Coracina tenuirostris* (cicadabird) • *Merops ornatus* (rainbow bee-eater); and • *Zosterops lateralis* (silvereye)	N/A	N/A	Refer to section 4.2.1.4.

Uncontrolled when printed unless issued and stamped Controlled Copy.

4.2.1.1. Ground-truthed Threatened Ecological Communities

One EPBC Act listed Threatened Ecological Community (TEC), Brigalow (*Acacia harpophylla* dominant and co-dominant), was recorded at two locations within the site. Assessment against the key diagnostic characteristics and condition thresholds identified within the associated listing advice (DotE, 2013a) is provided in Table 8. The two patches, consistent with RE 11.5.16, were located within the southern extent of the site in association with gently undulating, sandy plains. The locations of the ground-truthed TECs are provided in Appendix G: Ground Truthed Threatened Ecological Communities.

Table 8: Key diagnostic characteristics and condition thresholds

TEC criteria	Comment	Criteria met (Y/N)
The presence of *Acacia harpophylla* as one of the most abundant tree species in the patch. *A. harpophylla* is either dominant in the tree layer, or co-dominant with other species (notably *Casuarina cristata*, other species of *Acacia*, or species of *Eucalyptus*).	*Acacia harpophylla* was the dominant canopy species within both communities identified. Associated tree canopy species included *Eucalyptus populnea* (poplar box) and *Casuarina cristata* (belah).	Y
The community is located in one of the identified Bioregions and meets the description of a corresponding RE (refer to DotE (2013a)) **AND/OR** The vegetation in the patch is brigalow regrowth with species composition and structural elements broadly typical of one of the identified Queensland RE.	Although the communities were not mapped by DES (2015), the areas were ground-truthed to be remnant vegetation consistent with RE 11.5.16.	Y
The patch is 0.5 ha or more in size	Both communities exceeded 0.5 ha in size.	Y
Exotic perennial plants comprise less than 50% of the total vegetation cover of the patch, as assessed over a minimum sample area of 0.5 ha (100 m by 50 m), that is representative of the patch.	The communities contained minimal infestations of exotic plants with all stratum dominated by native species. The ground layer was dominated native species including *Paspalidium caespitosum* (brigalow grass), *Enchylaena tomentosa* (ruby saltbush), *Einadia nutans* (nodding saltbush), *Chloris divaricata* (spreading windmill grass) and *Solanum esuriale* (potato weed).	Y

4.2.1.2. Threatened Flora

No EPBC Act listed threatened flora were recorded during the field survey at the site. Based on field inspection results, an assessment of the likelihood of occurrence of EPBC Act listed threatened flora identified within the desktop searches (Table 6) is summarised in Table 9. No EPBC Act listed threatened flora are considered 'likely to occur' within the site.

Table 9: Field survey results for EPBC Act threatened flora

Family	Scientific/Common Name	Status	General Habitat Requirements/ Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
Apocynaceae	*Tylophora linearis*	E	*Tylophora linearis* grows in dry scrub, open forest and woodlands associated with *Melaleuca uncinata*, *E. fibrosa* (broad-leaved ironbark), *E. sideroxylon*, *E. albens* (white box), *Callitris endlicheri* (black cypress pine), *C. glaucophylla* (white cypress pine), *Allocasuarina luehmannii* (buloke), *Acacia hakeoides* and *Casuarina* spp. (DEWHA, 2008a).	11.7.7.	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database). suitable microhabitat for the species was observed within the site.
Poaceae	*Dichanthium setosum* bluegrass	V	*Dichanthium setosum* is associated with heavy, basaltic black soils and stony, red-brown loams with clay subsoils. The species has been recorded in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture. The extent to which this species tolerates disturbance is unknown (DEWHA, 2008b).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was limited within the site.
Poaceae	*Homopholis belsonii* Belson's panic	V	Belson's panic has been recorded in dry woodland habitats on poor soils, such as those derived from basalt. It occurs on rocky hills supporting *Eucalyptus albens* (white box) woodland; flat to gently undulating alluvial areas supporting *C. cristata* (belah) forest; and *E. populnea* (poplar box) woodlands. The species may also be associated with shadier areas of *A. harpophylla* (brigalow), *A. melvillei* (myall), *A. pendula* (weeping myall) and *E. orgadophila* (mountain coolibah) communities (DEWHA, 2008c).	11.5.1, 11.5.16, 11.5.20 and 11.7.7.	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database). suitable microhabitat for the species was observed within the site.

Family	Scientific/Common Name	Status	General Habitat Requirements/ Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
Surianaceae	*Cadellia pentastylis* ooline	V	The species has been recorded within semi-evergreen vine thickets and sclerophyll vegetation on undulating terrain, including sandstone, conglomerate and claystone. Soils generally have low to medium nutrient content and are usually associated with mid to upper slopes of rolling hills (land zones 7 and 9) (DotEE, 2018).	-	**Unlikely to occur** Although the species has been previously recorded in the desktop search extent (Wildlife Online Database), suitable habitat in the form of semi-evergreen vine thickets and rolling hills was lacking within the site.

Uncontrolled when printed unless issued and stamped Controlled Copy.

4.2.1.3. Threatened Fauna

No EPBC Act listed threatened fauna species were recorded during the field surveys. An assessment of the likelihood of occurrence of EPBC Act listed threatened fauna, based on field results, is summarised within Table 10. One EPBC Act listed threatened fauna species, *Furina dunmalli* (ornamental snake), was considered 'likely to occur' within the site.

Table 10: Field survey results for EPBC Act threatened fauna

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
Birds	*Calidris ferruginea* Curlew sandpiper	CE	The species forages and roosts within intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons and around non-tidal swamps, lakes, lagoons, ponds in saltworks and sewage farms. Inland records of the species are sparsely scattered (DotEE, 2018).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was limited within the site.
	Erythrotriorchis radiatus red goshawk	V	The red goshawk prefers landscapes containing a mosaic of habitats including coastal and sub-coastal tall open forest, woodland and rainforest edges. Forests of intermediate density are particularly favoured, as are ecotones between variably dense habitats (i.e. ecotone between rainforest and sclerophyll forest). It generally avoids open habitats and is only rarely encountered over agricultural land. Nesting occurs in tall trees within one kilometre of permanent water, generally in open, biologically rich forest or woodland. The species is sparsely dispersed across approximately 15 per cent of coastal and sub-coastal Australia. The species occurs at low densities occupying home ranges estimated between 50 – 220 km^2 (Marchant and Higgins 1993; DotEE, 2018).	11.3.2, 11.5.1, 11.5.4, 11.5.20 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Geophaps scripta squatter pigeon	V	Potential distribution for the species extends south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to south-east Queensland, south-west to Stanthorpe, near the Queensland-NSW border, south to the NSW border, and north-westwards through Goondiwindi and the Brigalow Belt in Queensland to Charleville (DotEE, 2018). The species occurs in a wide range of habitats wherever there is a grassy understorey, including open-forests to sparse, open-woodlands and scrub dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species (remnant, regrowth or partly modified vegetation communities). It is often found within close proximity (3 km) of water bodies (DotEE, 2018).	11.3.2, 11.5.1, 11.5.4 and 11.5.20	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Grantiella picta painted honeyeater	V	Painted honeyeater is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory (DotEE, 2018). The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland (OEH, 2017). Forages on mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, *Casuarina* spp., *Callitris* spp. and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes (DotEE, 2015).	11.5.1, 11.5.4, 11.5.20 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Rostratula australis Australian painted snipe	E	Australian painted snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DotEE, 2018). The species also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. The Australian Painted Snipe sometimes utilises areas that are lined with trees, or that have some scattered fallen or washed-up timber (Marchant and Higgins, 1993). Breeding occurs in shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby, typically from or near small islands in fresh water wetlands (DotEE, 2018).	11.3.2	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
Fish	*Maccullochella peelii* Murray cod	V	The Murray cod utilises a range of habitats from clear, rocky streams, to slow-flowing, turbid lowland rivers and billabongs within main channels and large tributaries of the Murray-Darling Basin. Preferred microhabitat consists of large rocks, snags, overhanging stream banks and vegetation, tree stumps, logs, branches and other woody structures (DotEE, 2018).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and no permanently inundated watercourses are located within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
Mammals	*Chalinolobus dwyeri* large-eared pied bat	V	The species' current distribution is poorly known. Records exist from Shoalwater Bay, north of Rockhampton, Queensland, through to the vicinity of Ulladulla, NSW in the south (DotEE, 2018). In Queensland, further records are known from sandstone escarpments in the Carnarvon, Expedition Ranges and Blackdown Tablelands (DotEE, 2018). Habitat preferences include fertile woodland valleys or rainforest and moist eucalypt forests within close proximity to sandstone cliffs stretching from Blackdown Tableland in central eastern Qld, to Woollongong in NSW (DotEE, 2018; Menkhorst and Knight, 2011). Roosting sites have been observed within disused mineshafts, caves, overhangs and tree hollows (DotEE, 2018).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and no suitable roost sites were observed within the site.
	Dasyurus hallucatus northern quoll	E	The species occupies a diversity of habitats across its range including eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert (Department of Environment, Land, Water and Planning 2016). Northern Quoll are also known to occupy non-rocky lowland habitats such as beach scrub communities in central Queensland. Rocky areas provide prime habitat for northern quolls (Department of Environment, Land, Water and Planning, 2016).	11.7.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Nyctophilus corbeni south-eastern long-eared bat	V	In Queensland, it is known from <30 localities, mainly in the Brigalow Belt South Bioregion with the known distribution bordered by the Bunya Mountain National Park to the east, Expedition Range and Dawson River areas to the north, the Mulga Lands Bioregion west of Bollon to the west, and the NSW-Qld border to the south (DotEE, 2018). The species is found in a wide range of inland woodland vegetation types (TSSC, 2015) including box, ironbark, cypress pine woodlands, buloke woodlands, brigalow woodland, belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee (DotEE, 2018). The species is more abundant in extensive stands of vegetation in comparison to smaller woodland patches (DotEE, 2018).	11.3.2, 11.5.1, 11.5.20 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Petauroides volans greater glider	V	The species is generally restricted to eucalypt forests and woodlands, particularly favouring forest with a diversity of eucalypt species (TSSC, 2016). During the day the species shelters in tree hollows, with a particular selection for large hollows in large, old trees (TSSC, 2016). Modelling suggests that they require native forest patches of at least 160 km^2 to maintain viable populations (TSSC, 2016).	11.3.2, 11.5.1, 11.5.4 and 11.5.20	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Phascolarctos cinereus koala	V	Koalas occur in a variety of eucalypt forests and woodland communities. They feed almost entirely on eucalypt foliage with preferences varying regionally (Krockenberger *et al.*, 2012). Diet is thought to be a major determinant of habitat selection, with the species being able to use small remnants of original vegetation where suitable habitat is present (Krockenberger *et al.*, 2012). subhumid woodlands in central and southern regions and within Eucalypt woodlands along watercourses within semi-arid areas further west (DotEE, 2018).	11.3.2, 11.5.1, 11.5.4 and 11.5.20	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
Reptiles	*Delma torquata* collared delma	V	The collared delma is endemic to Queensland. This species has been recorded in south-west and central Queensland yet most records are from south-east Queensland such as the western suburbs of Brisbane and inland to the Bunya Mountains (DotEE, 2018). Also recorded from Blackdown Tablelands NP, and the Roma area (DotEE, 2018). The species normally inhabits dry eucalypt dominated woodlands and open-forests on stony soils or rocky ridges with an understorey of grasses and lantana (*Lantana montevidensis*) (DotEE, 2018). Land Zones the species is typically recorded from include Land Zone 3 (alluvial river and creek flats), 9 (undulating country on fine-grained sedimentary rocks) and 10 (sandstone ranges).	11.3.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Denisonia maculata ornamental snake	V	The Ornamental Snake is only known from the Brigalow Belt North, and parts of the Brigalow Belt South Bioregions (DotEE, 2018). The stronghold of this species is within the Fitzroy and Dawson River catchments, particularly in the area surrounding Moranbah (DotEE, 2018). The species is known to prefer woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in Queensland Regional Ecosystem Land Zone 4, but also lake margins and wetlands (DotEE, 2018). Gilgai formations are found where deep-cracking alluvial soils with high clay contents occur (Brigalow Belt Reptiles Workshop, 2010).	11.3.2	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Egernia rugosa yakka skink	V	The species is known to occur in open dry sclerophyll forest, woodland and scrub (Brigalow Belt Reptiles Workshop, 2010), including on Land Zones 3, 4, 5, 7, 9 and 10 (DotEE, 2018). Common woodland and open forest types include *Acacia harpophylla* (brigalow), *A. aneura* (mulga), *A. catenulata* (bendee), *A. shirleyi* (lancewood), *Casuarina cristata* (belah), *Eucalyptus populnea* (poplar box), *Eucalyptus* spp. and *Callitris glaucophylla* (white cypress pine) (Brigalow Belt Reptiles Workshop, 2010).	11.3.2, 11.5.1, 11.5.20, 11.7.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Elseya albagula southern snapping turtle	CE	Found only in Queensland in the Fitzroy, Mary and Burnett Rivers and associated smaller drainages in south eastern Queensland. The Fitzroy catchment population has been separated from the Mary and Burnett catchments for an extended period. It has been suggested that the two lineages can be considered to be Evolutionarily Significant Units (DotE, 2014). Prefers clear, flowing, well-oxygenated waters (DotE, 2014). Southern snapping turtles do occur in non-flowing waters, but typically at much reduced densities (DotE, 2014).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and no permanently inundated watercourses are located within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Furina dunmalli Dunmall's snake	V	Dunmall's Snake is found from near the Queensland border throughout the Brigalow Belt South and Nandewar bioregions, and as far south as Ashford in New South Wales (DotEE, 2018). In Queensland, it occurs primarily in the Brigalow Belt region in the south-eastern interior (DotEE, 2018). The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Tarong Power Station, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park (Brigalow Belt Reptiles Workshop, 2010). The species has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by *Acacia harpophylla*, *A. burrowii*, *A. deanei*, *A. leiocalyx*, *Callitris* spp. or *Allocasuarina luehmannii*; and various *Corymbia citriodora*, *Eucalyptus crebra* and *E. melanophloia*, *Callitris glaucophylla* open forest and woodland associations on sandstone derived soils (DotEE, 2018).	11.5.1 and 11.5.4	**Likely to occur** The species has been previously recorded in the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was observed within the site.
	Rheodytes leukops Fitzroy River turtle	V	The Fitzroy River Turtle is only found in flowing streams and permanent waterbodies within the Fitzroy River catchment, Queensland (DotEE, 2018). Generally associated with instream habitats providing deep pool and riffle sequences, this species also prefers *Vallisneria* spp. (ribbonweed) beds (DotEE, 2018). Common riparian trees associated with the species habitat include *Eucalyptus tereticornis* (Queensland blue gum), *Casuarina cunninghamiana* (river she-oak), *Melaleuca viminalis* (weeping bottlebrushes) and *Melaleuca linariifolia* (DotEE, 2018).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and no permanently inundated watercourses are located within the site.

4.2.1.4. Migratory and Marine Fauna

No EPBC Act listed migratory fauna species were recorded as a result of the field surveys. Three EPBC Act listed marine fauna were recorded during the field survey, including:

- *Coracina tenuirostris* (cicadabird)
- *Merops ornatus* (rainbow bee-eater); and
- *Zosterops lateralis* (silvereye)

An assessment of the likelihood of occurrence of EPBC Act listed marine and migratory fauna, based on field results, is summarised within Table 11.

Habitat utilised by a migratory species, occasionally or periodically, within a region that supports an ecologically significant proportion (as defined in DotE, 2013) of the population of a species; and/or habitat that is:

- of critical importance to the species at particular life-cycle stages; and/or
- utilised by a migratory species which is at the limit of the species' range; and/or
- within an area where the species is declining.

Marine and migratory species recorded or likely to occur within the site are considered common and widespread within the area, with suitable habitat likely to occur over much of the surrounding landscape. As such, habitat within the site is not considered to constitute 'important habitat' as defined in the Significant Impact Guidelines (DotE, 2013b).

Table 11: Field survey results for EPBC Act migratory and marine fauna with potentially suitable RE and likelihood of occurrence.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
Birds	*Actitis hypoleucos* common sandpiper	Marine, Bonn, CAMBA, JAMBA, ROKAMBA	The common sandpiper utilise a wide range of wetland habitats with varying levels of salinity. Forages in shallow water and on bare soft mud at the edges of wetlands (DotEE, 2018). Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves (DotEE, 2018). In Queensland, areas of national importance occur in south-eastern Gulf of Carpentaria, and the Cairns foreshore (Watkins 1993).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable habitat was limited within the site.
	Apus pacificus fork-tailed swift	Marine, CAMBA, JAMBA, ROKAMBA	Almost exclusively aerial, mostly over inland plains and sometimes over foothills and coastal areas. The species has been recorded in dry or open habitats, including riparian woodland and tea-tree swamps, low scrub or saltmarsh. The species is known to forage among cliffs and tree-tops (Higgins, 1999).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20, 11.7.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Ardea alba great egret	Marine	Reported in a wide range of wetland habitats, including swamps, marshes, margins of rivers and lakes, damp or flooded grasslands, pastures, reservoirs, sewage treatment ponds, drainage channels, salt marshes, estuarine mudflats, mangrove swamps, coastal lagoons and offshore reefs. The species usually frequents shallow waters (DotEE, 2018).	11.3.2	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Ardea ibis cattle egret	Marine	The species is widespread throughout the eastern coast of Australia. It occurs in tidal mudflats, saltmarshes, mangroves, freshwater wetlands and sewage ponds (Pizzey and Knight, 2010).	11.3.2	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Calidris acuminata sharp-tailed sandpiper	Marine, Bonn, CAMBA, JAMBA, ROKAMBA	Prefer muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation; including lagoons, swamps, lakes and pools near the coast. Also use flooded plains, paddocks and other ephemeral wetlands. (Higgins and Davies, 1996).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable habitat was limited within the site.
	Calidris ferruginea curlew sandpiper	Marine, Bonn, CAMBA, JAMBA, ROKAMBA	Refer to Table 10.		
	Calidris melanotos pectoral sandpiper	Marine, Bonn, JAMBA, ROKAMBA	In Queensland, most records for the species occur around Cairns. There are scattered records elsewhere, mainly from east of the Great Divide between Townsville and Yeppoon (Higgins and Davies, 1996). The species prefers shallow fresh to saline wetlands, coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Usually found in coastal or near coastal habitat but occasionally found further inland (Pizzey and Knight, 2010).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable habitat was limited within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Cuculus optatus oriental cuckoo	Marine, CAMBA, JAMBA, ROKAMBA	A regular non-breeding migrant to coastal northern and eastern Australia and islands. The species has been recorded in monsoon forest, rainforest edges, leafy trees in paddocks, river flats, roadsides, mangroves and islands (Pizzey and Knight, 2010).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20, 11.7.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Coracina tenuirostris cicadabird	Marine	The species is widespread throughout the northern and eastern coasts of Australia. The cicadabird has been recorded in rainforests, eucalypt forests, woodlands and mangroves (Pizzey and Knight, 2010).	11.3.2, 11.5.1, 11.5.4, 11.5.20 and 11.7.7	**Present** The species was observed during the field survey and suitable habitat was present within the site.
	Gallinago hardwickii Latham's snipe	Marine, Bonn, JAMBA, ROKAMBA	This species migrates to Australia in summer. It resides in soft wet ground or shallow water with tussocks, wet parts of paddocks, seepage below dams, irrigated areas, scrub or open woodland from sea level to alpine bogs over 2000 m, saltmarsh and mangrove fringes (DotEE, 2018)	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable habitat was limited within the site.
	Haliaeetus leucogaster white-bellied sea-eagle	Marine	The species inhabits coastal habitats and terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. Habitats occupied by the species are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, and the sea) (DotEE, 2018).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and suitable habitat was limited within the site.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Hirundapus caudacutus white-throated needletail	Marine, CAMBA, JAMBA, ROKAMBA	The species migrates to Australia from mid-October to mid-April (Pizzey and Knight 2010). Occurring over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps (DotEE, 2018).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20, 11.7.2 and 11.7.7	**Potential to occur** Although the species has not been previously recorded in the desktop search extent (Wildlife Online Database), suitable microhabitat for the species was observed within the site.
	Merops ornatus rainbow bee-eater	Marine	The species is a widespread, summer breeding migrant to Australia (Pizzey and Knight, 2010). It occurs mainly in open forests and woodlands, shrublands and various cleared/semi-cleared habitats, including farmland. It usually occurs in open, cleared or lightly-timbered areas that are often located in proximity to permanent water. It also occurs in grasslands and, especially in arid or semi-arid areas, in riparian, floodplain or wetland vegetation assemblages (DotEE, 2018).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20, 11.7.2 and 11.7.7	**Present** The species was observed during the field survey and suitable habitat was present within the site.
	Motacilla flava yellow wagtail	CAMBA, JAMBA, ROKAMBA	The species is a summer migrant to northeast Queensland with records in the Cairns/Townsville region and around Rockhampton. The species prefers environs with short grass and bare ground, swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns (Pizzey and Knight, 2010).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and the site is located outside of the species known distribution.

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Myiagra cyanoleuca satin flycatcher	Bonn	In Queensland, the species is widespread but scattered with records in Cape York Peninsula, from the Cape south to a line between Aurukun and Coen. The species is more widespread farther south, though still scattered along coastal areas from Musgrave Station south along the Great Divide and occasionally further west (Blakers *et al*. 1984). Satin Flycatchers are widespread in south-eastern Queensland, in the area from Fraser Island, west to Goombi and south to the NSW border (Blakers *et al*. 1984). Satin Flycatchers mainly inhabit eucalypt forests, often near wetlands or watercourses, often dominated by *Eucalyptus fastigiata*, *E. dalrympleana* or occasionally *E. regnans*. The species has also been recorded in dry sclerophyll forests and woodlands, usually dominated by *E. blakelyi*, *E. sideroxylon*, *E. melliodora*, *E. albens* and *E. macrorrhyncha* (Traill *et al*. 1996).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and the site is located outside of the species known distribution.
	Rhipidura rufifrons rufous fantail	Bonn	The species occurs in coastal and near coastal districts of northern and eastern Australia (Lindsey 1992). Breeding populations occur on and east of the Great Dividing Range from the NSW-Queensland border, north to the Cairns-Atherton region (Higgins *et al*. 2006). In east and south-east Australia, the species inhabits wet sclerophyll forests usually with a dense shrubby understorey often including ferns. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests (Higgins *et al*. 2006).	-	**Unlikely to occur** The species has not been previously recorded in the desktop search extent (Wildlife Online Database) and the site is located outside of the species known distribution.
	Rostratula australis Australian painted snipe	Marine	Refer to Table 10.		

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE at Site	Likelihood of Occurrence
	Zosterops lateralis silvereye	Marine	The species occurs throughout coastal areas within eastern and southern Australia. The species prefers most coastal and sub-coastal vegetation types (Pizzey and Knight, 2010).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20, 11.7.2 and 11.7.7	**Present** The species was observed during the field survey and suitable habitat was present within the site.

4.2.2. Queensland Environmental Matters

4.2.2.1. Field Survey Results Summary

Field survey results for State environmental matters are outlined in Table 12.

Table 12: State environmental matters - field survey results

State environmental matters	Present (Y/N)	Location	Description	Status	Comments
Endangered regional ecosystems	Y	Community centroid -26.3859; 149.4936 Community centroid -26.3919; 149.5149	RE 11.5.16 – *Acacia harpophylla* and/or *Casuarina cristata* open forest in depressions on Cainozoic sand plains and remnant surfaces.	Endangered	Refer to section 4.2.2.2.
Of concern regional ecosystems	Y	Fringing watercourses and drainage lines.	RE 11.3.2 – *Eucalyptus camaldulensis* (sometimes *E. populnea* and or *E. tereticornis*) woodland in drainage depressions.	Of concern	Refer to section 4.2.2.2.
NC Act listed flora (EVNT)	N	-	-	-	Refer to section 0.
NC Act listed fauna (EVNT)	N	-	-	-	Refer to section 4.2.2.1.
Special Least Concern plants (SLC)	Y	Observed throughout the site	Special Least Concern plants recorded within the site include: • *Brachychiton populneus* • *Cheilanthes distans* • *Cheilanthes sieberi* • *Cymbidium canaliculatum*; and • *Santalum lanceolatum*.	N/A	Refer to section 4.2.2.2.

Uncontrolled when printed unless issued and stamped Controlled Copy.

4.2.2.2. Ground Truthed Regional Ecosystems

DES Remnant Regional Ecosystem mapping (2015) identified both homogenous and heterogenous polygons comprising four REs within the site. REs identified in the DES mapping included:

- RE 11.3.2 - *Eucalyptus populnea* woodland on alluvial plains
- RE 11.5.1 - *Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces
- RE 11.5.5 - *Eucalyptus melanophloia*, *Callitris glaucophylla* woodland on Cainozoic sand plains and/or remnant surfaces; and
- RE 11.7.2 - *Acacia* spp. woodland on Cainozoic lateritic duricrust.

The DES mapping was ground truthed as partially correct within the site. A summary of REs and mature regrowth communities observed within the site are presented in Table 13. All ground-truthed regional ecosystems are represented schematically in Appendix H: Ground Truthed Regional Ecosystems.

Table 13: Ground Truthed Regional Ecosystems

RE ID	Biodiversity status	REDD short description	Field Description and Condition
11.3.2b	Of concern	*Eucalyptus camaldulensis* (sometimes *E. populnea* and or *E. tereticornis*) woodland in drainage depressions.	*E. camaldulensis* dominated fringing riparian woodlands with associated *Angophora floribunda* and E. populnea on minor alluvial, drainage lines.
11.5.1	No concern at present	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces.	*E. populnea* and *E. crebra* dominant and co-dominant woodlands with a sub-canopy of A. luehmannii and/or C. glaucophylla. Surface sediments within patches comprised deep sands with a minor presence of lateritic nodules. Evidence of historical selective clearing was observed within patches in the southern extent of the site in areas previously mapped by DES as containing mature regrowth vegetation.
11.5.1a	No concern at present	*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer.	*E. populnea* dominant woodlands with a sub-canopy comprising *A. luehmannii*. Surface sediments within patches comprised deep sands with a minor presence of lateritic nodules.
11.5.4	No concern at present	*Eucalyptus chloroclada*, *Callitris glaucophylla*, *C. endlicheri*, *Angophora leiocarpa* woodland on Cainozoic sand plains and/or remnant surfaces	*E. chloroclada* and *C. glaucophylla* dominated open forest with associated *A. leiocarpa* on deep sand plains.
11.5.16	Endangered	*Acacia harpophylla* and/or *Casuarina cristata* open forest in depressions on Cainozoic sand plains and remnant surfaces	*A. harpophylla* dominated open forest with associated *C. cristata* and *E. populnea* on sand plains. Communities observed were small (<1ha) within areas mapped by DES as containing non-remnant vegetation.
11.5.20	No concern at present	*Eucalyptus moluccana* and/or *E. microcarpa* and/or *E. woollsiana* +/- *E. crebra* woodland on Cainozoic sand plains	*E. woollsiana* dominated woodland with associated *E. populnea*, *A. luehmannii* and *C. glaucophylla* on sand plains.

RE ID	Biodiversity status	REDD short description	Field Description and Condition
11.7.2	No concern at present	*Acacia* spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone.	*Acacia shirleyi* dominated woodlands on shallow soils and minor lateritic rises. Lower slopes contained areas of associated *E. fibrosa* and *E. crebra*.
11.7.7	No concern at present	*Eucalyptus fibrosa* subsp. *nubila* +/- *Corymbia* spp. +/- *Eucalyptus* spp. woodland on Cainozoic lateritic duricrust	*E. fibrosa* dominated woodlands with associated *E. crebra*, *C. glaucophylla* and *E. exserta*. Surface sediments within these patches comprised lateritic shallow sands and exposed areas of duricrust within the southern extent of the site.

4.2.2.3. Ground-truthed Mature Regrowth

Heterogenous polygons of mature regrowth vegetation were mapped within the site by DES (2013), including areas containing 'endangered' RE 11.9.5. The DES mapping was ground truthed as incorrect within the site, comprising mature regrowth containing 'no concern at present' RE and vegetation consistent with remnant vegetation (refer to Table 13).

Other areas mapped by DES as containing non-remnant vegetation and remnant vegetation (located within the northern extent of the site) were also ground-truthed as containing mature regrowth containing 'no concern at present' RE. All ground-truthed mature regrowth communities are represented schematically in Appendix H: Ground Truthed Regional Ecosystems.

Table 14: Ground Truthed Mature Regrowth

DES mapped description	Field Description and Condition	Ground-truthed Mature Regrowth Category
Mapped as containing remnant revegetation RE 11.5.1/1.5.5/11.7.2.	*E. populnea* dominated regrowth woodlands on sandy plains. **Regrowth consistent with RE 11.5.1a.**	Mature Regrowth containing a 'No concern at present' regional ecosystem.
Mapped as non-remnant vegetation.	*C. glaucophylla* dominated low woodland on sandy plains. **Regrowth consistent with RE 11.5.4a.**	Mature Regrowth containing a 'No concern at present' regional ecosystem.
Mapped as Mature Regrowth containing an 'endangered' regional ecosystem (11.3.2/11.9.5), 'no concern at present' (11.5.1/11.5.5/11.7.2) and non-remnant vegetation.	*E. populnea* and *E. crebra* dominant and co-dominant woodlands with a sub-canopy of A. luehmannii and/or C. glaucophylla. Surface sediments within patches comprised deep sands with a minor presence of lateritic nodules. **Regrowth consistent with RE 11.5.1**	Mature Regrowth containing a 'No concern at present' regional ecosystem.

4.2.2.4. Threatened Flora

The site is located within a mapped Protected Plant High Risk Area (refer Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants)). A Protected Plants Flora Survey in accordance with the Department of Environment and Heritage Protection *Flora Survey Guidelines: Protected Plants* (2016), was not conducted as part of the field survey.

No NC Act listed flora species were recorded during the field survey at the site. An assessment of the likelihood of occurrence for NC Act listed threatened flora species, based on the results of the desktop and field survey, is summarised in Table 15. One NC Act listed flora species, *Acacia wardellii*, is considered 'likely to occur' within the site. Areas of the site in proximity to the previously recorded individuals (HERBRECS Record BRI AQ0817414), were traversed however no individuals were identified.

Table 15: Field survey results for NC Act EVNT flora

Family	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE	Likelihood of Occurrence
Apocynaceae	*Tylophora linearis*	E	Refer to Table 9		
Asteraceae	*Rutidosis lanata*	NT	*Rutidosis lanata* has been recorded in open eucalypt forests and woodlands including *Eucalyptus populnea* and *Casuarina cristata* forest, *Eucalypt crebra* and *Acacia sparsiflora* forest and *E. populnea* woodland. It has been recorded growing on flat land or stony red ridges in grey clays, red-brown clay or sandy loams (Land Zone 4 and 5) (DES, 2018b).	11.5.1	**Potential to occur** Although the species has been previously recorded in the desktop search extent (Wildlife Online Database), areas of clay or clay influence were limited within the site (predominantly sandy plains), reducing the species likelihood of occurrence.
Mimosaceae	*Acacia wardellii*	NT	*Acacia wardellii* has been recorded on plateaus of red/brown lateritic crusts, sands over duricrusts, hard mottled clays, low laterised scarps, crests and flat-topped ridges (DES, 2018c). The species has also been observed to along roadsides and clearings, suggesting it responds positively to disturbance (DES, 2018c).	11.5.1, 11.7.2 and 11.7.7	**Likely to occur** The species has been recorded in close proximity to the site (<1km) and suitable habitat is present.

Family	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable RE	Likelihood of Occurrence
Poaceae	*Homopholis belsonii*	E	Refer to Table 9		
Surianaceae	*Cadellia pentastylis* ooline	V	Refer to Table 9		

4.2.2.1. Threatened Fauna

No NC Act listed fauna species were recorded during the field survey at the site. An assessment of the likelihood of occurrence of all other NC Act listed threatened fauna species, based on the desktop and field results, is provided in Table 16. Four Threatened species listed under the NC Act are considered 'likely to occur' within the site, including:

- *Aspidites ramsayi* (woma) – Near Threatened
- *Calyptorhynchus lathami lathami* (glossy black-cockatoo) – Near Threatened
- *Furina dunmalli* (Dunmall's snake) – Vulnerable; and
- *Strophurus taenicauda* (golden-tailed gecko) – Near Threatened.

Table 16: Field survey results for NC Act EVNT fauna

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable REs	Likelihood of Occurrence
Birds	*Calidris ferruginea* curlew sandpiper	E	Refer to Table 10.		
	Calyptorhynchus lathami lathami glossy black-cockatoo (eastern)	V	The species has a strong preference for woodland dominated by *Allocasuarina*, or open sclerophyll forests or woodlands, with a middle stratum of *Allocasuarina* below *Eucalyptus*, *Corymbia* or *Angophora* (Glossy Black Conservancy, 2010). The species is rarely found away from *Allocasuarina* or *Casuarina* (she-oak) trees, which provide their primary food source (DotEE, 2018). Glossy black-cockatoos breed mainly within woodland or remnant woodland containing large, old trees, but have also been recorded in dead, ringbarked eucalypts in cleared country. The species is an obligate hollow nester and requires a hollow stump or limb, living or dead, or a hole in the trunk of a large, old tree, usually a eucalypt, for breeding (Glossy Black Conservancy, 2010).	11.3.2, 11.5.1, 11.5.4, 11.5.16, 11.5.20 and 11.7.7	**Likely to occur** The species has been previously recorded within the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was observed within the site.
	Erythrotriorchis radiatus red goshawk	E	Refer to Table 10.		
	Geophaps scripta scripta squatter pigeon (southern)	V	Refer to Table 10.		
	Grantiella picta *painted honeyeater*	V	Refer to Table 10.		
	Rostratula australis Australian painted snipe	V	Refer to Table 10.		
Mammals	*Chalinolobus dwyeri* large-eared pied bat	V	Refer to Table 10.		

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable REs	Likelihood of Occurrence
	Nyctophilus corbeni south-eastern long-eared bat	V	Refer to Table 10.		
	Petauroides volans greater glider	V	Refer to Table 10.		
	Phascolarctos cinereus koala	V	Refer to Table 10.		
Reptiles	*Aspidites ramsayi* woma	NT	Wide variety of dry habitats from spinifex desert to brigalow (Wilson and Swan, 2010). Known from eucalyptus and acacia woodlands, heaths, and shrublands (Wilson and Swan, 2010). Can inhabit cleared and regrowth areas where underground shelters persist (Bruton *et al*. 2014). Reliant on underground burrows for shelter during extremely hot and cold conditions (Bruton *et al*., 2014). Also uses fallen tree hollows, timber piles, root balls, and leaf litter for shelter (Bruton *et al*., 2014). Incubates and protects its eggs by coiling its body around the clutch almost continually until they hatch (Bruton *et al*., 2014). Eggs are laid in underground burrows (Bruton *et al*., 2014). Active forager, preying on reptiles and small mammals, including the introduced hare and rabbit (Bruton *et al*., 2014).	11.3.2, 11.5.1, 11.5.4, 11.5.20, 11.7.2 and 11.7.7	**Likely to occur** The species has been previously recorded within the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was observed within the site.
	Delma torquata collared delma	V	Refer to Table 10.		
	Denisonia maculata ornamental snake	V	Refer to Table 10.		
	Egernia rugosa yakka skink	V	Refer to Table 10.		

Class	Scientific/Common Name	Status	General Habitat Requirements/Notes	Potentially Suitable REs	Likelihood of Occurrence
	Elseya albagula southern snapping turtle	E	Refer to Table 10.		
	Furina dunmalli Dunmall's snake	V	Refer to Table 10.		
	Rheodytes leukops *Fitzroy River turtle*	V	Refer to Table 10.		
	Strophurus taenicauda golden-tailed gecko	NT	Occurs in open woodland and open forest, particularly where cypress pine is present, where it shelters under loose bark and hollow limbs (Wilson and Swan, 2010). The golden-tailed gecko is arboreal (lives in trees) where it shelters under loose bark or in hollows limbs, emerging at night to feed on insects.	11.5.1, 11.5.4, 11.5.20, 11.7.2, 11.7.7	**Likely to occur** The species has been previously recorded within the desktop search extent (Wildlife Online Database) and suitable microhabitat for the species was observed within the site.
	Furina dunmalli Dunmall's snake	V	Refer to Table 10		

4.2.2.2. Special Least Concern Species

No Special Least Concern fauna species were detected during the field survey. A number of diggings and termitaria were also observed within the site and may provide foraging habitat for the short-beaked echidna (*Tachyglossus aculeatus*), a special least concern fauna species.

Five listed Special Least Concern flora species were detected during the field survey, including:

- *Brachychiton populneus* (kurrajong)
- *Cheilanthes distans* (bristly cloak fern)
- *Cheilanthes sieberi*
- *Cymbidium canaliculatum* (black orchid); and
- *Santalum lanceolatum* (sandalwood).

4.2.2.3. Other Environmental Values

A number of features were also observed within the site which may afford habitat for native fauna. These features included:

- a number of watercourses (mapped Stream Order (SO) 3, SO 2 and SO 1) and drainage lines traversing the site. Ephemeral pools were observed within waterways and drainage lines at the time of the field survey. Three dams were also observed within the site and were currently inundated. These features may afford habitat for native amphibians and waterbirds when inundated.
- a number of hollow-bearing trees and stags were observed throughout the site. These trees are likely to afford suitable habitat for arboreal fauna and nesting bird species.
- remnant vegetation communities contained numerous trees with decorticating bark and high levels of leaf litter, providing habitat for small, native herpetofauna.
- areas containing remnant vegetation within the southern extent of the site contained numerous large logs and woody debris, resulting from historical selective logging activities. Woody debris may provide habitat for herpetofauna and small mammals.
- a number of diggings and termitaria were also observed throughout the site, indicating foraging by reptiles, small mammals and/or echidnas.

4.2.3. Disturbance

Areas of remnant vegetation and mature regrowth throughout the site, particularly the southern extent (areas containing RE 11.5.1), contained evidence of historical clearing (selective). These disturbance features are depicted in photographs taken at quaternary and habitat assessment site.

A number of access tracks were also observed throughout the southern extent of the site, however could not be accessed by vehicle due to fallen timber and vegetative regrowth.

5. Conclusions

An ecological assessment was undertaken within the site from 13 to 15 March 2018. The site contained areas of remnant vegetation, with some patches of mature regrowth previously mapped by DES, qualifying as remnant in accordance with Neldner *et al.* (2017).

One MNES TEC, as listed under the EPBC Act, was observed within the site in association with remnant vegetation patches containing RE 11.5.16.

Although no threatened flora and fauna species were recorded within the site during the field survey, one threatened flora and four threatened fauna species are considered 'likely to occur', including:

- *Acacia wardellii* – Near Threatened (NC Act)
- *Aspidites ramsayi* (woma) – Near Threatened (NC Act)
- *Calyptorhynchus lathami lathami* (glossy black-cockatoo) – Near Threatened (NC Act)
- *Furina dunmalli* (Dunmall's snake) – Vulnerable (EPBC Act and NC Act); and
- *Strophurus taenicauda* (golden-tailed gecko) – Near Threatened (NC Act).

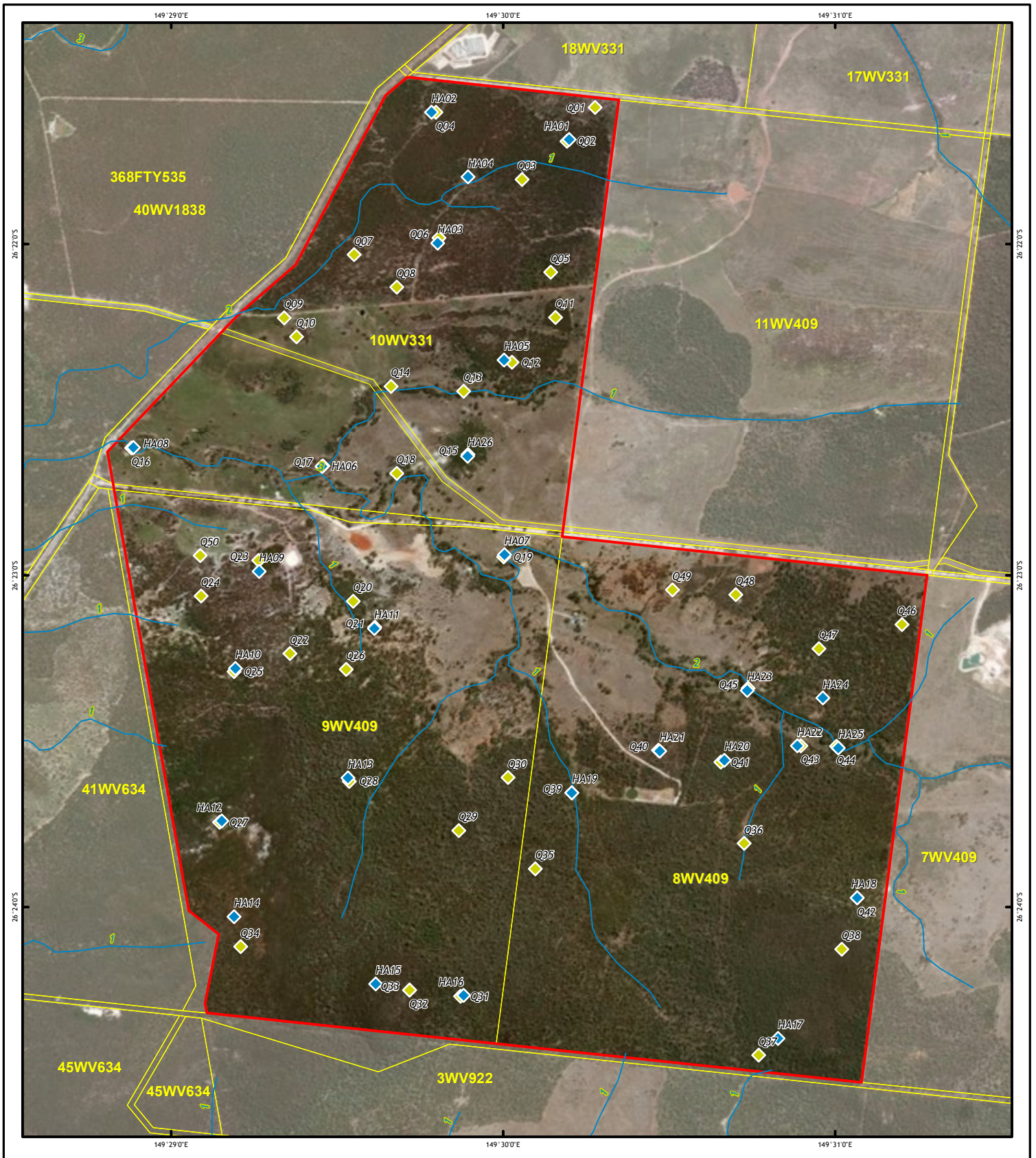
Other habitat features, including watercourses, dams, hollow-bearing trees and woody debris were also observed throughout the site and likely to provide foraging and breeding habitat for native fauna.

Taking into account the findings of this report, it is recommended that:

- a suitably qualified fauna spotter/catcher supervises clearing of vegetation and other proposed disturbance to fauna habitat as described within this report
- a suitably qualified person (SQP) conduct a targeted protected flora survey in accordance with the *Flora Survey Guidelines - Protected Plants*, once a development infrastructure footprint is proposed
- disturbance within ground-truthed areas of containing TEC (GTRE 11.5.16) and remnant vegetation fringing watercourses should be avoided
- weed management protocols (i.e. weed wash-down procedures) are implemented during construction activities
- where practicable, disturbance to remnant vegetation within ground-truthed RE communities should be minimised.

It is recommended that the findings in this report are considered during detailed development planning such that disturbance to the ecological values of the site and locality may be avoided wherever practical. Where disturbance is unavoidable, impact mitigation measures are to be implemented in accordance with the approved site environmental management plan and regulatory approval conditions.

Appendix A: Site Location and Survey Points



Legend

- Fauna Habitat Assessments
- Vegetation Surveys
- Ordered Drainage 100K
- Site
- Cadastre

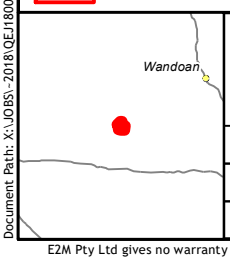
N

Scale 1:29,000 (A4)

0 300 600 900 1,200

Metres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2018
Cadastre: © DNRME 2018
Ordered Drainage: © DNRME 2018
Road: © PSMA 2014

Rev	Description	Drawn	Approved	Date
0	Issued for Use	CD	PW	13/04/2018
B	Issued for Review	CD	PW	09/04/2018

APPENDIX A: SITE LOCATION AND SURVEY POINTS

Ecological Assessment
Origin Energy

Map Number	Job Number	Rev
1 of 1	QEJ18008	0

Document Path: X:\JOBS\-2018\QEJ18008\GIS\QEJ18008_APPENDIX_A.mxd

E2M Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability for any loss, damage or costs (including consequential damage) relating to any use of the data in this map.

Appendix B: Results of EPBC Protected Matters Search Tool

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

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

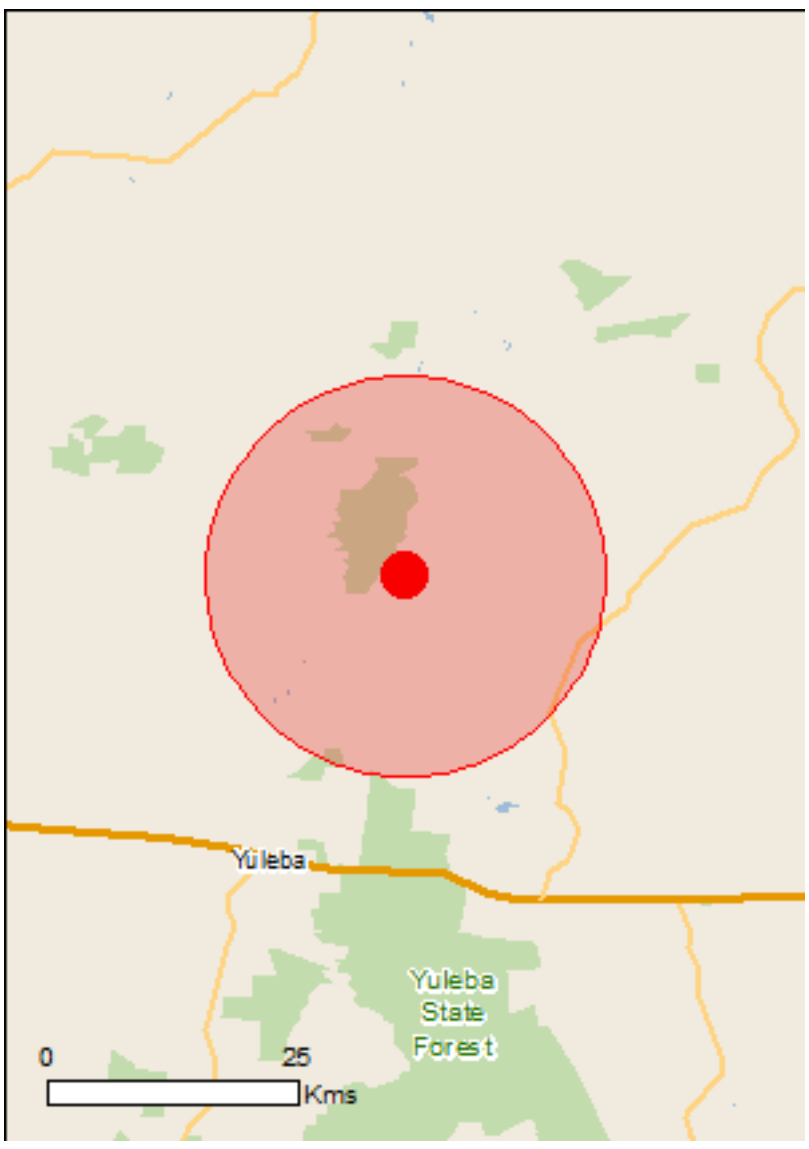
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 23/01/18 17:30:44

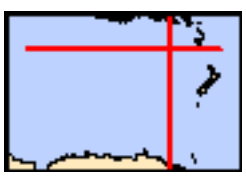
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 20.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	22
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	1200 - 1300km
Narran lake nature reserve	300 - 400km upstream
Riverland	1100 - 1200km
The coorong, and lakes alexandrina and albert wetland	1300 - 1400km

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
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 likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
[Dasyurus hallucatus](#)		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
[Nyctophilus corbeni](#)		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
[Petauroides volans](#)		
Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Other		
[Adclarkia dulacca](#)		
Dulacca Woodland Snail [83885]	Endangered	Species or species habitat likely to occur within area
Plants		
[Cadellia pentastylis](#)		
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
[Dichanthium setosum](#)		
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
[Homopholis belsonii](#)		
Belson's Panic [2406]	Vulnerable	Species or species habitat may occur within area
[Tylophora linearis](#)		
[55231]	Endangered	Species or species habitat may occur within area
Reptiles		
[Delma torquata](#)		
Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
[Denisonia maculata](#)		
Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
[Egernia rugosa](#)		
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
[Elseya albagula](#)		
Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
[Furina dunmalli](#)		
Dunmall's Snake [59254]	Vulnerable	Species or species habitat known to occur within area
[Rheodytes leukops](#)		
Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species	[Resource Information]	
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#)		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		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
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species	[Resource Information]

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

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area

Caveat

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

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

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

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

Where very little information is available for 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 reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

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

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-26.38389 149.49971

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.

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix C: Wildlife Online Database Search Results

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -26.3839
Longitude: 149.4997
Distance: 20
Email: peter.wagner@e2mconsulting.com.au
Date submitted: Tuesday 23 Jan 2018 16:38:09
Date extracted: Tuesday 23 Jan 2018 16:40:03

The number of records retrieved = 458

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Hylidae	*Cyclorana sp.*					5/1
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		2
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		3
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		29
animals	amphibians	Hylidae	*Cyclorana verrucosa*	rough collared frog		C		1
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		4
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		2
animals	amphibians	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog		C		7
animals	amphibians	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog		C		5
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		10
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		14
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		2
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		5
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		1
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		2
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		3
animals	birds	Acanthizidae	*Acanthiza apicalis*	inland thornbill		C		11
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		16
animals	birds	Acanthizidae	*Acanthiza uropygialis*	chestnut-rumped thornbill		C		5
animals	birds	Acanthizidae	*Chthonicola sagittata*	speckled warbler		C		3
animals	birds	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill		C		3
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		2
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		7
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		2
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		5
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		1
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron		C		1
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		3
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		2
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		2
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		22
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		6
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		3
animals	birds	Artamidae	*Cracticus tibicen*	Australian magpie		C		7
animals	birds	Artamidae	*Artamus personatus*	masked woodswallow		C		2
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		8
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		1
animals	birds	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo		C		1
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		2
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		6
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		5
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		2
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		3
animals	birds	Corcoracidae	*Struthidea cinerea*	apostlebird		C		7
animals	birds	Corvidae	*Corvus coronoides*	Australian raven		C		9
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		14

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		1
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		1
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		1
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		3
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		2
animals	birds	Falconidae	*Falco subniger*	black falcon		C		1
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		3
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		1
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		1
animals	birds	Maluridae	*Malurus leucopterus*	white-winged fairy-wren		C		1
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		5
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		2
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		2
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		1
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		2
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		3
animals	birds	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater		C		1
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		20
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		2
animals	birds	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater		C		6
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		1
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		1
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		1
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		9
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		1
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		3
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		4
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		4
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		9
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		2
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		3
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		1
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		2
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		15
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		3
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		2
animals	birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet		C		1
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		6
animals	birds	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot		C		3
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		4
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		9
animals	birds	Turnicidae	*Turnix sp.*					1/1
animals	birds	Tytonidae	*Tyto delicatula*	eastern barn owl		C		2
animals	mammals	Dasyuridae	*Planigale tenuirostris*	narrow-nosed planigale		C		1
animals	mammals	Dasyuridae	*Sminthopsis macroura*	stripe-faced dunnart		C		8
animals	mammals	Dasyuridae	*Sminthopsis murina*	common dunnart		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			1
animals	mammals	Macropodidae	*Macropus rufogriseus*	red-necked wallaby		C		8
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		1
animals	mammals	Macropodidae	*Macropus dorsalis*	black-striped wallaby		C		3
animals	mammals	Molossidae	*Tadarida australis*	white-striped freetail bat		C		1
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			2
animals	mammals	Muridae	*Pseudomys delicatulus*	delicate mouse		C		5/1
animals	mammals	Petauridae	*Petaurus breviceps*	sugar glider		C		3
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		6
animals	mammals	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat		C		1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		3
animals	mammals	Vespertilionidae	*Vespadelus vulturnus*	little forest bat		C		2
animals	mammals	Vespertilionidae	*Chalinolobus picatus*	little pied bat		C		3
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		13
animals	reptiles	Boidae	*Antaresia maculosa*	spotted python		C		3
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		1
animals	reptiles	Boidae	*Aspidites ramsayi*	woma		NT		3
animals	reptiles	Carphodactylidae	*Underwoodisaurus milii*	thick-tailed gecko		C		1
animals	reptiles	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle		C		1
animals	reptiles	Diplodactylidae	*Lucasium steindachneri*	Steindachner's gecko		C		3
animals	reptiles	Diplodactylidae	*Diplodactylus vittatus*	wood gecko		C		4
animals	reptiles	Diplodactylidae	*Oedura monilis*	ocellated velvet gecko		C		11
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		12
animals	reptiles	Elapidae	*Brachyurophis australis*	coral snake		C		2
animals	reptiles	Elapidae	*Hoplocephalus bitorquatus*	pale-headed snake		C		1
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		2
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		3
animals	reptiles	Elapidae	*Cryptophis boschmai*	Carpentaria whip snake		C		1
animals	reptiles	Elapidae	*Denisonia devisi*	De Vis' banded snake		C		10/1
animals	reptiles	Elapidae	*Parasuta dwyeri*	Dwyer's snake		C		4
animals	reptiles	Elapidae	*Furina dunmalli*	Dunmall's snake		V	V	1
animals	reptiles	Elapidae	*Suta suta*	myall snake		C		6
animals	reptiles	Elapidae	*Furina diadema*	red-naped snake		C		4/1
animals	reptiles	Gekkonidae	*Gehyra dubia*	dubious dtella		C		22
animals	reptiles	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko		C		31
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		2
animals	reptiles	Pygopodidae	*Pygopus schraderi*	eastern hooded scaly-foot		C		4/1
animals	reptiles	Pygopodidae	*Paradelma orientalis*	brigalow scaly-foot		C		3/1
animals	reptiles	Scincidae	*Carlia pectoralis sensu lato*			C		7/1
animals	reptiles	Scincidae	*Eremiascincus fasciolatus*	narrow-banded sand swimmer		C		1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		12
animals	reptiles	Scincidae	*Lerista punctatovittata*	eastern robust slider		C		6
animals	reptiles	Scincidae	*Ctenotus sp.*					2
animals	reptiles	Scincidae	*Lerista timida*	timid slider		C		12
animals	reptiles	Scincidae	*Menetia greyii*	common dwarf skink		C		4/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Scincidae	*Ctenotus ingrami*	unspotted yellow-sided ctenotus		C		3
animals	reptiles	Scincidae	*Lerista fragilis*	eastern mulch slider		C		7
animals	reptiles	Scincidae	*Carlia pectoralis*	open-litter rainbow skink		C		2
animals	reptiles	Scincidae	*Egernia striolata*	tree skink		C		1
animals	reptiles	Scincidae	*Liopholis modesta*	eastern ranges rock-skink		C		3
animals	reptiles	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus		C		1/1
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		2
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		16/2
animals	reptiles	Scincidae	*Morethia boulengeri*	south-eastern morethia skink		C		19/1
animals	reptiles	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink		C		1/1
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		2
animals	reptiles	Scincidae	*Pygmaeascincus timlowi*	dwarf litter-skink		C		1
animals	reptiles	Typhlopidae	*Anilios affinis*	small-headed blind snake		C		1
animals	reptiles	Typhlopidae	*Anilios ligatus*	robust blind snake		C		4/1
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		4
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		2
animals	reptiles	Varanidae	*Varanus tristis*	black-tailed monitor		C		3
animals	reptiles	Varanidae	*Varanus panoptes*	yellow-spotted monitor		C		4
fungi	sac fungi	Parmeliaceae	*Parmotrema parahypotropum*			C		1/1
fungi	sac fungi	Parmeliaceae	*Punctelia subflava*			C		1/1
fungi	sac fungi	Pertusariaceae	*Ochrolechia hawaiensis*			C		1/1
fungi	sac fungi	Physciaceae	*Physcia nubila*			C		1/1
fungi	sac fungi	Teloschistaceae	*Caloplaca fraserensis*			C		1/1
plants	conifers	Cupressaceae	*Callitris glaucophylla*	white cypress pine		C		6
plants	ferns	Adiantaceae	*Cheilanthes sieberi subsp. sieberi*			C		2
plants	ferns	Adiantaceae	*Cheilanthes distans*	bristly cloak fern		C		4/2
plants	higher dicots	Acanthaceae	*Dipteracanthus australasicus subsp. corynothecus*			C		1/1
plants	higher dicots	Acanthaceae	*Brunoniella australis*	blue trumpet		C		4
plants	higher dicots	Acanthaceae	*Rostellularia adscendens var. adscendens*			C		3
plants	higher dicots	Acanthaceae	*Rostellularia adscendens*			C		1/1
plants	higher dicots	Amaranthaceae	*Amaranthus retroflexus*		Y			1/1
plants	higher dicots	Amaranthaceae	*Nyssanthes erecta*			C		2
plants	higher dicots	Amaranthaceae	*Alternanthera nana*	hairy joyweed		C		2
plants	higher dicots	Apocynaceae	*Marsdenia viridiflora subsp. viridiflora*			C		3/1
plants	higher dicots	Apocynaceae	*Gomphocarpus fruticosus*	narrow-leaved cotton bush	Y			1/1
plants	higher dicots	Apocynaceae	*Carissa ovata*	currantbush		C		1
plants	higher dicots	Apocynaceae	*Parsonsia eucalyptophylla*	gargaloo		C		2
plants	higher dicots	Asteraceae	*Pterocaulon redolens*			C		1
plants	higher dicots	Asteraceae	*Vittadinia pustulata*			C		3/1
plants	higher dicots	Asteraceae	*Cyanthillium cinereum*			C		2
plants	higher dicots	Asteraceae	*Eriochlamys cupularis*			C		2/2
plants	higher dicots	Asteraceae	*Senecio brigalowensis*			C		2/2
plants	higher dicots	Asteraceae	*Vittadinia pterochaeta*	rough fuzzweed		C		1/1
plants	higher dicots	Asteraceae	*Ozothamnus cassinioides*			C		1/1
plants	higher dicots	Asteraceae	*Ozothamnus diosmifolius*	white dogwood		C		1/1
plants	higher dicots	Asteraceae	*Chrysocephalum apiculatum*	yellow buttons		C		3/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Asteraceae	*Sphaeromorphaea australis*			C		1
plants	higher dicots	Asteraceae	*Pseudognaphalium luteoalbum*	Jersey cudweed		C		1/1
plants	higher dicots	Asteraceae	*Vittadinia dissecta var. hirta*			C		3/1
plants	higher dicots	Asteraceae	*Vittadinia dissecta var. dissecta*			C		1/1
plants	higher dicots	Asteraceae	*Coronidium oxylepis subsp. lanatum*			C		1/1
plants	higher dicots	Asteraceae	*Olearia canescens subsp. canescens*			C		1/1
plants	higher dicots	Asteraceae	*Peripleura hispidula var. hispidula*			C		1/1
plants	higher dicots	Asteraceae	*Rhodanthe diffusa subsp. leucactina*			C		1/1
plants	higher dicots	Asteraceae	*Brachyscome whitei subsp. lophoptera*			C		1/1
plants	higher dicots	Asteraceae	*Senecio pinnatifolius var. pinnatifolius*			C		1
plants	higher dicots	Asteraceae	*Calotis dentex*	white burr daisy		C		1/1
plants	higher dicots	Asteraceae	*Cirsium vulgare*	spear thistle	Y			3
plants	higher dicots	Asteraceae	*Cotula australis*	common cotula		C		1/1
plants	higher dicots	Asteraceae	*Rutidosis lanata*			NT		1/1
plants	higher dicots	Asteraceae	*Erigeron pusillus*		Y			1/1
plants	higher dicots	Asteraceae	*Calotis cuneifolia*	burr daisy		C		1/1
plants	higher dicots	Asteraceae	*Calotis lappulacea*	yellow burr daisy		C		2
plants	higher dicots	Asteraceae	*Euchiton sphaericus*			C		1
plants	higher dicots	Asteraceae	*Gamochaeta purpurea*		Y			1/1
plants	higher dicots	Asteraceae	*Glossocardia bidens*	native cobbler's pegs		C		1
plants	higher dicots	Asteraceae	*Minuria integerrima*	smooth minuria		C		1
plants	higher dicots	Asteraceae	*Senecio tenuiflorus*			C		1/1
plants	higher dicots	Asteraceae	*Brachyscome ciliaris*			C		1
plants	higher dicots	Asteraceae	*Erigeron bonariensis*		Y			1/1
plants	higher dicots	Asteraceae	*Gamochaeta antillana*		Y			1/1
plants	higher dicots	Bignoniaceae	*Pandorea pandorana*	wonga vine		C		1/1
plants	higher dicots	Brassicaceae	*Lepidium bonariense*	Argentine peppercress	Y			2/1
plants	higher dicots	Brassicaceae	*Arabidella eremigena*			C		2/2
plants	higher dicots	Brassicaceae	*Cardamine hirsuta*	common bittercress	Y			1/1
plants	higher dicots	Cactaceae	*Opuntia stricta*		Y			1
plants	higher dicots	Cactaceae	*Opuntia tomentosa*	velvety tree pear	Y			4/1
plants	higher dicots	Caesalpiniaceae	*Senna glutinosa subsp. glutinosa*			C		1
plants	higher dicots	Caesalpiniaceae	*Chamaecrista nomame*			C		1/1
plants	higher dicots	Caesalpiniaceae	*Erythrostemon gilliesii*		Y			1/1
plants	higher dicots	Campanulaceae	*Wahlenbergia graniticola*	granite bluebell		C		2
plants	higher dicots	Campanulaceae	*Lobelia gibbosa*	native lobelia		C		1/1
plants	higher dicots	Campanulaceae	*Wahlenbergia tumidifructa*			C		1/1
plants	higher dicots	Capparaceae	*Capparis mitchellii*			C		3
plants	higher dicots	Caryophyllaceae	*Gypsophila australis*			C		1/1
plants	higher dicots	Casuarinaceae	*Casuarina cristata*	belah		C		1
plants	higher dicots	Casuarinaceae	*Allocasuarina luehmannii*	bull oak		C		1
plants	higher dicots	Celastraceae	*Denhamia cunninghamii*			C		1
plants	higher dicots	Chenopodiaceae	*Einadia hastata*			C		2
plants	higher dicots	Chenopodiaceae	*Sclerolaena holtiana*			C		1/1
plants	higher dicots	Chenopodiaceae	*Einadia nutans subsp. nutans*			C		1
plants	higher dicots	Chenopodiaceae	*Einadia nutans subsp. linifolia*			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Chenopodiaceae	*Sclerolaena birchii*	galvanised burr		C		2
plants	higher dicots	Chenopodiaceae	*Chenopodium desertorum subsp. anidiophyllum*			C		1
plants	higher dicots	Chenopodiaceae	*Enchylaena tomentosa*			C		2
plants	higher dicots	Chenopodiaceae	*Maireana microphylla*			C		3
plants	higher dicots	Chenopodiaceae	*Einadia polygonoides*	knotweed goosefoot		C		1
plants	higher dicots	Chenopodiaceae	*Sclerolaena bicornis var. horrida*			C		1
plants	higher dicots	Convolvulaceae	*Evolvulus alsinoides var. villosicalyx*			C		1
plants	higher dicots	Convolvulaceae	*Evolvulus alsinoides*			C		1/1
plants	higher dicots	Crassulaceae	*Crassula tetramera*			C		1/1
plants	higher dicots	Cucurbitaceae	*Cucumis myriocarpus subsp. myriocarpus*	prickly pademelon	Y			1/1
plants	higher dicots	Droseraceae	*Drosera lunata*			C		1/1
plants	higher dicots	Droseraceae	*Drosera finlaysoniana*			C		1/1
plants	higher dicots	Droseraceae	*Drosera burmanni*			C		2/2
plants	higher dicots	Elatinaceae	*Elatine gratioloides*	waterwort		C		1/1
plants	higher dicots	Euphorbiaceae	*Euphorbia dallachyana*			C		1
plants	higher dicots	Fabaceae	*Zornia*			C		1/1
plants	higher dicots	Fabaceae	*Zornia areolata*			C		1/1
plants	higher dicots	Fabaceae	*Glycine tabacina*	glycine pea		C		1
plants	higher dicots	Fabaceae	*Mirbelia pungens*			C		1/1
plants	higher dicots	Fabaceae	*Desmodium varians*	slender tick trefoil		C		4
plants	higher dicots	Fabaceae	*Zornia muriculata*			C		1/1
plants	higher dicots	Fabaceae	*Crotalaria medicaginea var. medicaginea*			C		1/1
plants	higher dicots	Fabaceae	*Chorizema parviflorum*	eastern flame pea		C		1/1
plants	higher dicots	Fabaceae	*Medicago minima var. minima*		Y			2/2
plants	higher dicots	Fabaceae	*Glycine clandestina var. sericea*			C		3
plants	higher dicots	Fabaceae	*Glycine clandestina var. clandestina*			C		2/2
plants	higher dicots	Fabaceae	*Zornia muelleriana subsp. muelleriana*			C		5/5
plants	higher dicots	Fabaceae	*Crotalaria montana*			C		1
plants	higher dicots	Goodeniaceae	*Goodenia glabra*			C		1
plants	higher dicots	Goodeniaceae	*Goodenia delicata*			C		3/2
plants	higher dicots	Goodeniaceae	*Goodenia rosulata*			C		1/1
plants	higher dicots	Goodeniaceae	*Scaevola spinescens*	prickly fan flower		C		1
plants	higher dicots	Goodeniaceae	*Goodenia fascicularis*			C		2
plants	higher dicots	Goodeniaceae	*Goodenia rotundifolia*			C		1/1
plants	higher dicots	Gyrostemonaceae	*Codonocarpus attenuatus*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum gracile*			C		1/1
plants	higher dicots	Haloragaceae	*Gonocarpus urceolatus*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum striatum*			C		2/2
plants	higher dicots	Haloragaceae	*Myriophyllum gracile var. lineare*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum implicatum*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum variifolium*			C		1/1
plants	higher dicots	Haloragaceae	*Haloragis heterophylla*	rough raspweed		C		1/1
plants	higher dicots	Lamiaceae	*Teucrium puberulum*			C		1/1
plants	higher dicots	Lamiaceae	*Teucrium sp. (Pittsworth A.R.Bean 18338)*			C		1/1
plants	higher dicots	Lamiaceae	*Prostanthera sp. (Baking Board V.Hando 135)*			C		1/1
plants	higher dicots	Lamiaceae	*Mentha satureioides*	native pennyroyal		C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Loganiaceae	*Mitrasacme alsinoides*			C		1/1
plants	higher dicots	Loganiaceae	*Mitrasacme paludosa*			C		1/1
plants	higher dicots	Loranthaceae	*Dendrophthoe glabrescens*			C		1/1
plants	higher dicots	Loranthaceae	*Lysiana exocarpi subsp. tenuis*			C		1/1
plants	higher dicots	Loranthaceae	*Lysiana subfalcata*			C		1/1
plants	higher dicots	Malvaceae	*Sida atherophora*			C		1/1
plants	higher dicots	Malvaceae	*Sida corrugata*			C		1
plants	higher dicots	Malvaceae	*Abutilon oxycarpum var. incanum*			C		1/1
plants	higher dicots	Malvaceae	*Malvastrum americanum var. americanum*		Y			1
plants	higher dicots	Malvaceae	*Sida hackettiana*			C		2
plants	higher dicots	Malvaceae	*Hibiscus sturtii var. sturtii*			C		1
plants	higher dicots	Malvaceae	*Malvastrum coromandelianum*	prickly malvastrum	Y			1
plants	higher dicots	Malvaceae	*Sida aprica var. aprica*			C		1/1
plants	higher dicots	Malvaceae	*Abutilon oxycarpum*			C		3
plants	higher dicots	Meliaceae	*Owenia acidula*	emu apple		C		1
plants	higher dicots	Mimosaceae	*Acacia amblygona*	fan-leaf wattle		C		1/1
plants	higher dicots	Mimosaceae	*Acacia shirleyi*	lancewood		C		1/1
plants	higher dicots	Mimosaceae	*Acacia salicina*	doolan		C		3
plants	higher dicots	Mimosaceae	*Acacia conferta*			C		2/2
plants	higher dicots	Mimosaceae	*Acacia pendula*	myall		C		1
plants	higher dicots	Mimosaceae	*Acacia leiocalyx subsp. leiocalyx*			C		4/2
plants	higher dicots	Mimosaceae	*Acacia wardellii*			NT		1/1
plants	higher dicots	Mimosaceae	*Acacia macradenia*	zig-zag wattle		C		3/1
plants	higher dicots	Mimosaceae	*Acacia harpophylla*	brigalow		C		1/1
plants	higher dicots	Mimosaceae	*Acacia sparsiflora*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia crassa subsp. crassa*			C		1
plants	higher dicots	Mimosaceae	*Acacia bancroftiorum*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia longispicata*			C		1/1
plants	higher dicots	Mimosaceae	*Acacia spectabilis*	pilliga wattle		C		1/1
plants	higher dicots	Mimosaceae	*Acacia excelsa subsp. excelsa*			C		1
plants	higher dicots	Mimosaceae	*Acacia jucunda*			C		6
plants	higher dicots	Mimosaceae	*Acacia decora*	pretty wattle		C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus tereticornis subsp. tereticornis*			C		1/1
plants	higher dicots	Myrtaceae	*Eucalyptus chloroclada*	Baradine red gum		C		2/1
plants	higher dicots	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash		C		1
plants	higher dicots	Myrtaceae	*Eucalyptus populnea*	poplar box		C		8
plants	higher dicots	Myrtaceae	*Angophora leiocarpa*	rusty gum		C		1
plants	higher dicots	Myrtaceae	*Melaleuca uncinata*			C		1/1
plants	higher dicots	Myrtaceae	*Melaleuca quercina*			C		1/1
plants	higher dicots	Nyctaginaceae	*Boerhavia dominii*			C		2
plants	higher dicots	Oleaceae	*Jasminum didymum subsp. racemosum*			C		1
plants	higher dicots	Oleaceae	*Jasminum didymum subsp. lineare*			C		2
plants	higher dicots	Onagraceae	*Oenothera indecora subsp. bonariensis*		Y			1/1
plants	higher dicots	Orobanchaceae	*Buchnera*			C		1/1
plants	higher dicots	Oxalidaceae	*Oxalis perennans*			C		1/1
plants	higher dicots	Phyllanthaceae	*Phyllanthus virgatus*			C		2/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Picrodendraceae	*Petalostigma pubescens*	quinine tree		C		1
plants	higher dicots	Pittosporaceae	*Auranticarpa rhombifolia*			C		1/1
plants	higher dicots	Plantaginaceae	*Plantago debilis*	shade plantain		C		1/1
plants	higher dicots	Plantaginaceae	*Veronica plebeia*	trailing speedwell		C		1/1
plants	higher dicots	Polygalaceae	*Polygala triflora*			C		1/1
plants	higher dicots	Polygonaceae	*Persicaria decipiens*	slender knotweed		C		1/1
plants	higher dicots	Portulacaceae	*Portulaca bicolor*			C		1/1
plants	higher dicots	Portulacaceae	*Portulaca pilosa*		Y			2/1
plants	higher dicots	Proteaceae	*Grevillea striata*	beefwood		C		1
plants	higher dicots	Rubiaceae	*Psydrax johnsonii*			C		1/1
plants	higher dicots	Rubiaceae	*Cyclophyllum coprosmoides var. coprosmoides*			C		1/1
plants	higher dicots	Rubiaceae	*Oldenlandia mitrasacmoides subsp. trachymenoides*			C		1/1
plants	higher dicots	Rubiaceae	*Spermacoce brachystema*			C		1/1
plants	higher dicots	Rutaceae	*Geijera parviflora*	wilga		C		4
plants	higher dicots	Sapindaceae	*Alectryon oleifolius subsp. elongatus*			C		2
plants	higher dicots	Sapindaceae	*Dodonaea lanceolata var. subsessilifolia*			C		1/1
plants	higher dicots	Sapindaceae	*Dodonaea viscosa subsp. spatulata*			C		6/1
plants	higher dicots	Sapindaceae	*Alectryon diversifolius*	scrub boonaree		C		2
plants	higher dicots	Sapindaceae	*Dodonaea heteromorpha*			C		1/1
plants	higher dicots	Sapindaceae	*Alectryon pubescens*			C		1/1
plants	higher dicots	Sapindaceae	*Dodonaea filifolia*			C		1/1
plants	higher dicots	Sapindaceae	*Atalaya hemiglauca*			C		2
plants	higher dicots	Sapindaceae	*Dodonaea biloba*			C		2/2
plants	higher dicots	Scrophulariaceae	*Eremophila mitchellii*			C		11/1
plants	higher dicots	Scrophulariaceae	*Eremophila debilis*	winter apple		C		1
plants	higher dicots	Scrophulariaceae	*Myoporum acuminatum*	coastal boobialla		C		1
plants	higher dicots	Scrophulariaceae	*Eremophila deserti*			C		7/1
plants	higher dicots	Solanaceae	*Solanum coracinum*			C		2/2
plants	higher dicots	Solanaceae	*Solanum nemophilum*			C		1
plants	higher dicots	Solanaceae	*Solanum parvifolium*			C		3
plants	higher dicots	Solanaceae	*Solanum parvifolium subsp. parvifolium*			C		1/1
plants	higher dicots	Solanaceae	*Solanum ferocissimum*			C		2/2
plants	higher dicots	Solanaceae	*Solanum jucundum*			C		1/1
plants	higher dicots	Solanaceae	*Nicotiana megalosiphon subsp. megalosiphon*			C		1/1
plants	higher dicots	Stackhousiaceae	*Stackhousia muricata*			C		1
plants	higher dicots	Stackhousiaceae	*Stackhousia viminea*	slender stackhousia		C		3/1
plants	higher dicots	Sterculiaceae	*Brachychiton populneus*			C		4
plants	higher dicots	Sterculiaceae	*Brachychiton populneus subsp. trilobus*			C		1
plants	higher dicots	Stylidiaceae	*Stylidium debile*	frail trigger plant		C		2/2
plants	higher dicots	Surianaceae	*Cadellia pentastylis*	ooline		V	V	6/6
plants	higher dicots	Verbenaceae	*Glandularia aristigera*		Y			3
plants	higher dicots	Viscaceae	*Korthalsella taenioides forma taenioides*			C		1/1
plants	higher dicots	Viscaceae	*Viscum articulatum*	flat mistletoe		C		1/1
plants	lower dicots	Linderniaceae	*Lindernia sp. (Tingoora A.R.Bean 10311)*			C		2/2
plants	lower dicots	Linderniaceae	*Lindernia*			C		2/2
plants	lower dicots	Phrymaceae	*Mimulus*			C		2/2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	lower dicots	Ranunculaceae	*Ranunculus sessiliflorus var. sessiliflorus*			C		1/1
plants	lower dicots	Ranunculaceae	*Clematis microphylla*			C		3/3
plants	monocots	Commelinaceae	*Aneilema acuminatum*			C		1/1
plants	monocots	Commelinaceae	*Aneilema sclerocarpum*			C		1/1
plants	monocots	Commelinaceae	*Murdannia graminea*	murdannia		C		2
plants	monocots	Cyperaceae	*Schoenus apogon var. apogon*			C		1/1
plants	monocots	Cyperaceae	*Cyperus sanguinolentus*			C		1/1
plants	monocots	Cyperaceae	*Bulbostylis pyriformis*			C		1/1
plants	monocots	Cyperaceae	*Cyperus alterniflorus*			C		1/1
plants	monocots	Cyperaceae	*Schoenus yarrabensis*			C		1/1
plants	monocots	Cyperaceae	*Isolepis hookeriana*			C		1/1
plants	monocots	Cyperaceae	*Cyperus perangustus*			C		1/1
plants	monocots	Cyperaceae	*Scleria sphacelata*			C		2/2
plants	monocots	Cyperaceae	*Schoenus centralis*			C		1/1
plants	monocots	Cyperaceae	*Cyperus gracilis*			C		4/1
plants	monocots	Cyperaceae	*Schoenus apogon*			C		1/1
plants	monocots	Cyperaceae	*Fuirena incrassata*			C		1/1
plants	monocots	Cyperaceae	*Cyperus flaccidus*			C		2/2
plants	monocots	Cyperaceae	*Fuirena arenosa*			C		1/1
plants	monocots	Cyperaceae	*Cyperus*			C		1
plants	monocots	Hemerocallidaceae	*Dianella rara*			C		1/1
plants	monocots	Hemerocallidaceae	*Dianella caerulea*			C		1/1
plants	monocots	Hemerocallidaceae	*Dianella longifolia var. longifolia*			C		1
plants	monocots	Johnsoniaceae	*Tricoryne elatior*	yellow autumn lily		C		1
plants	monocots	Juncaceae	*Juncus subsecundus*			C		1/1
plants	monocots	Juncaceae	*Juncus aridicola*	tussock rush		C		1
plants	monocots	Juncaceae	*Juncus usitatus*			C		1/1
plants	monocots	Juncaceae	*Juncus continuus*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*			C		4/1
plants	monocots	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra confertifolia subsp. pallida*			C		2/2
plants	monocots	Laxmanniaceae	*Thysanotus tuberosus*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra leucocephala subsp. leucocephala*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra filiformis*			C		1/1
plants	monocots	Laxmanniaceae	*Laxmannia gracilis*	slender wire lily		C		1/1
plants	monocots	Laxmanniaceae	*Laxmannia compacta*			C		1/1
plants	monocots	Laxmanniaceae	*Lomandra longifolia*			C		1
plants	monocots	Orchidaceae	*Cymbidium canaliculatum*			C		12
plants	monocots	Poaceae	*Chloris ventricosa*	tall chloris		C		2
plants	monocots	Poaceae	*Chrysopogon fallax*			C		1
plants	monocots	Poaceae	*Eragrostis brownii*	Brown's lovegrass		C		2/2
plants	monocots	Poaceae	*Eragrostis curvula*		Y			3/3
plants	monocots	Poaceae	*Eragrostis sororia*			C		1/1
plants	monocots	Poaceae	*Eriachne mucronata*			C		1/1
plants	monocots	Poaceae	*Paspalidium gracile*	slender panic		C		1
plants	monocots	Poaceae	*Cymbopogon refractus*	barbed-wire grass		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	monocots	Poaceae	*Digitaria longiflora*			C		1/1
plants	monocots	Poaceae	*Eragrostis lacunaria*	purple lovegrass		C		6/2
plants	monocots	Poaceae	*Eragrostis leptocarpa*	drooping lovegrass		C		1/1
plants	monocots	Poaceae	*Eremochloa bimaculata*	poverty grass		C		1/1
plants	monocots	Poaceae	*Heteropogon contortus*	black speargrass		C		1
plants	monocots	Poaceae	*Aristida caput-medusae*			C		5/1
plants	monocots	Poaceae	*Arundinella nepalensis*	reedgrass		C		1/1
plants	monocots	Poaceae	*Cleistochloa subjuncea*			C		2/2
plants	monocots	Poaceae	*Enneapogon lindleyanus*			C		2
plants	monocots	Poaceae	*Enteropogon acicularis*	curly windmill grass		C		1/1
plants	monocots	Poaceae	*Setaria paspalidioides*			C		1/1
plants	monocots	Poaceae	*Ancistrachne uncinulata*	hooky grass		C		1
plants	monocots	Poaceae	*Austrostipa ramosissima*	bamboo grass		C		1/1
plants	monocots	Poaceae	*Eragrostis megalosperma*			C		1/1
plants	monocots	Poaceae	*Austrostipa verticillata*	slender bamboo grass		C		1
plants	monocots	Poaceae	*Paspalidium albovillosum*			C		2/2
plants	monocots	Poaceae	*Digitaria divaricatissima*	spreading umbrella grass		C		1/1
plants	monocots	Poaceae	*Sporobolus coromandelianus*		Y			1/1
plants	monocots	Poaceae	*Dinebra decipiens var. decipiens*			C		1/1
plants	monocots	Poaceae	*Dinebra decipiens var. peacockii*			C		1/1
plants	monocots	Poaceae	*Chloris divaricata var. divaricata*	slender chloris		C		2
plants	monocots	Poaceae	*Dichanthium sericeum subsp. sericeum*			C		1
plants	monocots	Poaceae	*Bothriochloa decipiens var. decipiens*			C		4
plants	monocots	Poaceae	*Aristida jerichoensis var. jerichoensis*			C		2/1
plants	monocots	Poaceae	*Poaceae*			C		1
plants	monocots	Poaceae	*Eriachne rara*			C		2/2
plants	monocots	Poaceae	*Aristida ramosa*	purple wiregrass		C		5/3
plants	monocots	Poaceae	*Panicum effusum*			C		3/1
plants	monocots	Poaceae	*Setaria dielsii*			C		1/1
plants	monocots	Poaceae	*Eriochloa crebra*	spring grass		C		1/1
plants	monocots	Poaceae	*Sarga leiocladum*			C		1/1
plants	monocots	Poaceae	*Themeda triandra*	kangaroo grass		C		1
plants	monocots	Poaceae	*Triraphis mollis*	purple plumegrass		C		2/2
plants	monocots	Poaceae	*Aristida contorta*	bunched kerosene grass		C		1/1
plants	monocots	Poaceae	*Aristida muricata*			C		2
plants	monocots	Poaceae	*Cenchrus ciliaris*		Y			1
plants	monocots	Poaceae	*Cenchrus spinifex*		Y			1/1
plants	monocots	Poaceae	*Digitaria diffusa*			C		1/1
plants	monocots	Poaceae	*Thellungia advena*	coolibah grass		C		1
plants	monocots	Poaceae	*Aristida personata*			C		2
plants	monocots	Xyridaceae	*Xyris complanata*	yellow-eye		C		1/1
plants	mosses	Meteoriaceae	*Papillaria crocea*			C		1/1
plants	mosses	Pottiaceae	*Trichostomum brachydontium*			C		1/1
plants	mosses	Ptychomitriaceae	*Ptychomitrium australe*			C		1/1

CODES

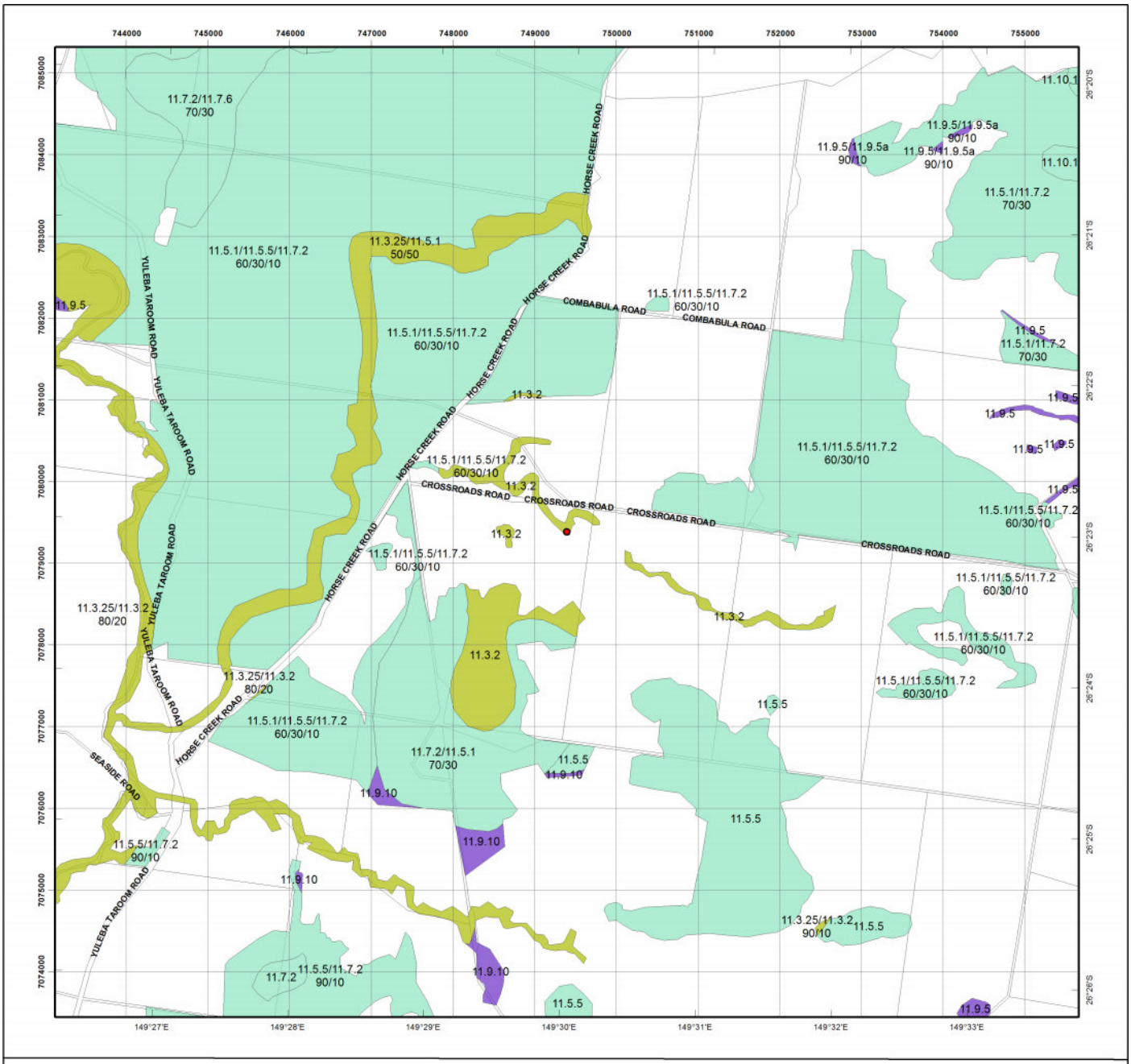
I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

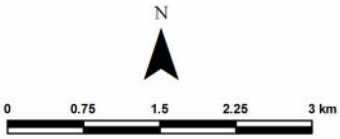
Appendix D: DES Mapped Remnant Regional Ecosystems



Remnant 2015 Regional Ecosystems

Biodiversity Status

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



This product is projected into GDA 1994 MGA Zone 55

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

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

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

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

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

Non-remnant vegetation includes regrowth and disturbed native vegetation.

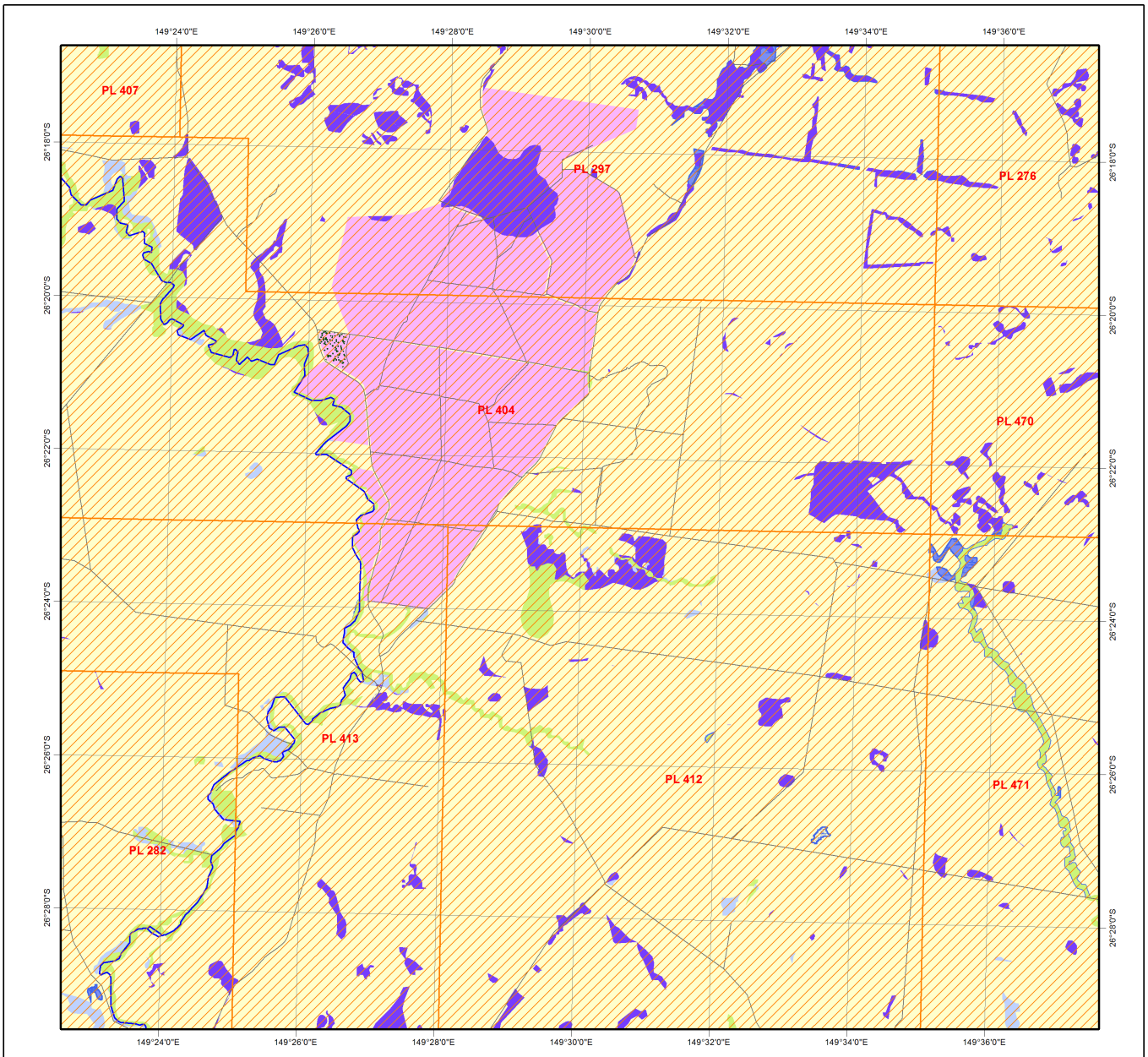
© The State of Queensland, 2018

Appendix E: DES Environmental Values Mapping on Site (ESAs, Referable Wetlands, Protected Plants)

Tenure type: Petroleum Lease

Map requested: 23/01/2018 16:17:38

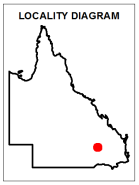
Centred on point position: Longitude: 149.49971 Latitude: -26.38389



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

- Petroleum Lease
- CATEGORY A
- National Parks
- Conservation Parks
- Forest Reserves
- Wet Tropics World Heritage Area
- Great Barrier Reef Marine Park Area
- Marine Parks other than General Use Zones
- CATEGORY B
- World Heritage Areas
- Queensland Heritage Register Places
- Ramsar Sites
- Cultural Heritage Registered Areas and DLA's other than Stanbroke
- Special Forestry Areas
- Fish Habitat Areas
- Koala Plan
- Coordinated Conservation Areas
- Endangered Regional Ecosystems (Biodiversity Status)
- Marine Parks other than General Use Zones
- Marine Plants
- CATEGORY C
- Essential Habitat
- Nature Refuges
- Resources Reserve
- State Forests
- Timber Reserves
- Of Concern Regional Ecosystems (remnant biodiversity status)
- OTHERS
- Towns
- Roads
- Rivers
- Springs
- Referable Wetlands
- Dominant Wetlands (51-100%)
- Subdominant Wetlands (0-50%)
- Queensland

LOCALITY DIAGRAM



N

0 1300 2600 3900 5200 6500 m

This product is projected into GDA 1994 MGA Zone 55

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

The State of Queensland disclaims all responsibility for information contained in this product and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or ncomplete in any way for any reason.

External contributors (non-government parties) of the data for this product are: Great Barrier Reef Marine Park Authority

Regional ecosystem mapping (remnant biodiversity status) may incorporate amendments, resulting from property level assessments, to the release version of the mapping available on QSpatial.

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

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

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

Mature Regrowth vegetation, depicting endangered regional ecosystems, was incorporated as of 24/07/2012.

© The State of Queensland, 2018

Queensland Government

Appendix F: List of Flora and Fauna Species Identified on Site

This Appendix provides a full list of all flora and fauna species recorded during the field surveys.

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
Fauna				
Birds	*Acanthiza pusilla*	brown thornbill	LC	-
	Accipiter cirrocephalus	collared sparrowhawk	LC	-
	Anthus novaeseelandiae	Australasian pipit	LC	-
	Aprosmictus erythropterus	red-winged parrot	LC	-
	Aquila audax	wedge-tailed eagle	LC	-
	Artamus leucorynchus	white-breasted woodswallow	LC	-
	Cacatua galerita	sulphur-crested cockatoo	LC	-
	Caligavis chrysops	yellow-faced honeyeater	LC	-
	Colluricincla harmonica	grey shrike-thrush	LC	-
	Coracina novaehollandiae	black-faced cuckoo-shrike	LC	-
	Coracina papuensis	white-bellied cuckoo-shrike	LC	-
	Coracina tenuirostris	cicadabird	LC	Marine
	Corvus coronoides	Australian raven	LC	-
	Corvus orru	Torresian crow	LC	-
	Cracticus nigrogularis	pied butcherbird	LC	-
	Cracticus tibicen	Australian magpie	LC	-
	Cracticus torquatus	grey butcherbird	LC	-
	Dacelo novaeguineae	laughing kookaburra	LC	-
	Daphoenositta chrysoptera	varied sittella	LC	-
	Egretta novaehollandiae	white-faced heron	LC	-
	Entomyzon cyanotis	blue-faced honeyeater	LC	-
	Eolophus roseicapilla	galah	LC	-
	Geopelia cuneata	diamond dove	LC	-
	Geopelia humeralis	bar-shouldered dove	LC	-
	Geopelia striata	peaceful dove	LC	-
	Gerygone fusca	western gerygone	LC	-
	Gerygone olivacea	white-throated gerygone	LC	-
	Grallina cyanoleuca	magpie-lark	LC	-
	Lichmera indistincta	brown honeyeater	LC	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Malurus cyaneus	superb fairy-wren	LC	-
	Manorina melanocephala	noisy miner	LC	-
	Merops ornatus	rainbow bee-eater	LC	Marine
	Myiagra inquieta	restless flycatcher	LC	-
	Ocyphaps lophotes	crested pigeon	LC	-
	Pachycephala rufiventris	rufous whistler	LC	-
	Pardalotus striatus	striated pardalote	LC	-
	Phaps chalcoptera	common bronzewing	LC	-
	Philemon citreogularis	little friarbird	LC	-
	Philemon corniculatus	noisy friarbird	LC	-
	Platycercus adscitus	pale-headed rosella	LC	-
	Pomatostomus temporalis	grey-crowned babbler	LC	-
	Rhipidura leucophrys	willie wagtail	LC	-
	Smicrornis brevirostris	weebill	LC	-
	Strepera graculina	pied currawong	LC	-
	Struthidea cinerea	apostlebird	LC	-
	Taeniopygia bichenovii	double-barred finch	LC	-
	Trichoglossus chlorolepidotus	scaly-breasted lorikeet	LC	-
	Zosterops lateralis	silvereye	LC	Marine
Mammals	*Macropus giganteus*	eastern grey kangaroo	LC	-
	Macropus rufogriseus	red-necked wallaby	LC	-
	Oryctolagus cuniculus	rabbit	I	-
Reptiles	*Ctenotus ingrami*	-	LC	-
	Oedura marmorata	marbled velvet gecko	LC	-
	Pogona barbata	bearded dragon	LC	-
	Varanus varius	lace monitor	LC	-
Flora				
Acanthaceae	*Brunoniella australis*	blue trumpet	LC	-
	Pseuderanthemum variabile	love flower	LC	-
	Rostellularia adscendens	pink tongues	LC	-
Adiantaceae	*Cheilanthes distans*	bristly cloak fern	SLC	-
	Cheilanthes sieberi	-	SLC	-
Amaranthaceae	*Achyranthes aspera*	chaff flower	LC	-
	Alternanthera nana	hairy joyweed	LC	-
	Gomphrena celosioides	soft khaki weed	I	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Nyssanthes diffusa	barbwire weed	LC	-
Apocynaceae	*Alstonia constricta*	bitter bark	LC	-
	Carissa ovata	currant bush	LC	-
	Parsonsia eucalyptophylla	gargaloo	LC	-
Asteraceae	*Calotis cuneata*	mountain burr daisy	LC	-
	Calotis lappulacea	yellow burr daisy	LC	-
	Cassinia laevis	cough bush	LC	-
	Chrysocephalum apiculatum	yellow buttons	LC	-
	Coronidium oxylepis	-	LC	-
	Cyanthillium cinereum	veronia	LC	-
	Glossocardia bidens	cobbler's tack	LC	-
	Olearia canescens	daisy bush	LC	-
	Peripleura hispidula	-	LC	-
	Pterocaulon redolens	fruit salad plant	LC	-
	Schkuhria pinnata	-	I	-
	Sphaeromorphaea australis	spreading nutheads	LC	-
	Verbesina encelioides	crownbeard	I	-
	Vittadinia dissecta	dissected New Holland daisy	LC	-
	Zinnia peruviana	wild zinnia	I	-
Bignoniaceae	*Pandorea pandorana*	wonga vine	LC	-
Byttneriaceae	*Seringia collina*	-	LC	-
Cactaceae	*Opuntia stricta*	prickly pear	I	-
	Opuntia tomentosa	velvety tree pear	I	-
Caesalpiniaceae	*Senna artemisioides*	silver cassia	LC	-
	Senna barclayana	smooth senna	LC	-
Capparaceae	*Capparis canescens*	corky barked wild orange	LC	-
	Capparis lasiantha	wait-a-while	LC	-
	Capparis loranthifolia	narrow-leaf bumble	LC	-
	Capparis mitchellii	wild orange	LC	-
Casuarinaceae	*Allocasuarina luehmannii*	bull oak	LC	-
Celastraceae	*Denhamia cunninghamii*	yellow berry bush	LC	-
Chenopodiaceae	*Einadia nutans*	nodding saltbush	LC	-
	Enchylaena tomentosa	ruby saltbush	LC	-
	Maireana microphylla	small-leaf bluebush	LC	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Salsola australis	soft roly poly	LC	-
	Sclerolaena birchii	galvanised burr	LC	-
	Sclerolaena muricata	prickly roly-poly	LC	-
Commelinaceae	*Commelina diffusa*	scurvy weed	LC	-
	Murdannia graminea	slug herb	LC	-
Convolvulaceae	*Dichondra repens*	kidney weed	LC	-
	Evolvulus alsinoides	baby blue eyes	LC	-
Cupressaceae	*Callitris endlicheri*	black cypress pine	LC	-
	Callitris glaucophylla	white cypress pine	LC	-
Cyperaceae	*Cyperus gracilis*	slender flat-sedge	LC	-
	Eleocharis plana	ribbed spike-rush	LC	-
	Fimbristylis dichotoma	common fringe-rush	LC	-
	Fuirena incrassata	-	LC	-
	Gahnia aspera	saw sedge	LC	-
	Scleria sp.	-	LC	-
Euphorbiaceae	*Euphorbia tannensis*	desert spurge	LC	-
	Petalostigma pubescens	quinine tree	LC	-
	Phyllanthus virgatus	-	LC	-
Fabaceae	*Chorizema parviflorum*	eastern flame pea	LC	-
	Desmodium varians	slender tick-trefoil	LC	-
	Glycine clandestina	twining glycine	LC	-
	Indigofera hirsuta	hairy indigo	LC	-
	Indigofera linnaei	Birdsville indigo	LC	-
	Lotus australis	Australian trefoil	LC	-
	Zornia dyctiocarpa	zornia	LC	-
Goodeniaceae	*Goodenia delicata*	-	LC	-
	Goodenia glabra	smooth goodenia	LC	-
	Goodenia rotundifolia	-	LC	-
Hemerocallidaceae	*Dianella caerulea*	blue flax lily	LC	-
	Tricoryne elatior	yellow rush lily	LC	-
Juncaceae	*Juncus usitatus*	common rush	LC	-
Lamiaceae	*Teucrium junceum*	native broom	LC	-
	Prostanthera cryptandroides	mint bush	LC	-
Laxmanniaceae	*Laxmannia gracilis*	slender wire lily	LC	-
Loganiaceae	*Mitrasacme sp.*	-	LC	-
Lomandraceae	*Lomandra longifolia*	spiny-headed mat-rush	LC	-

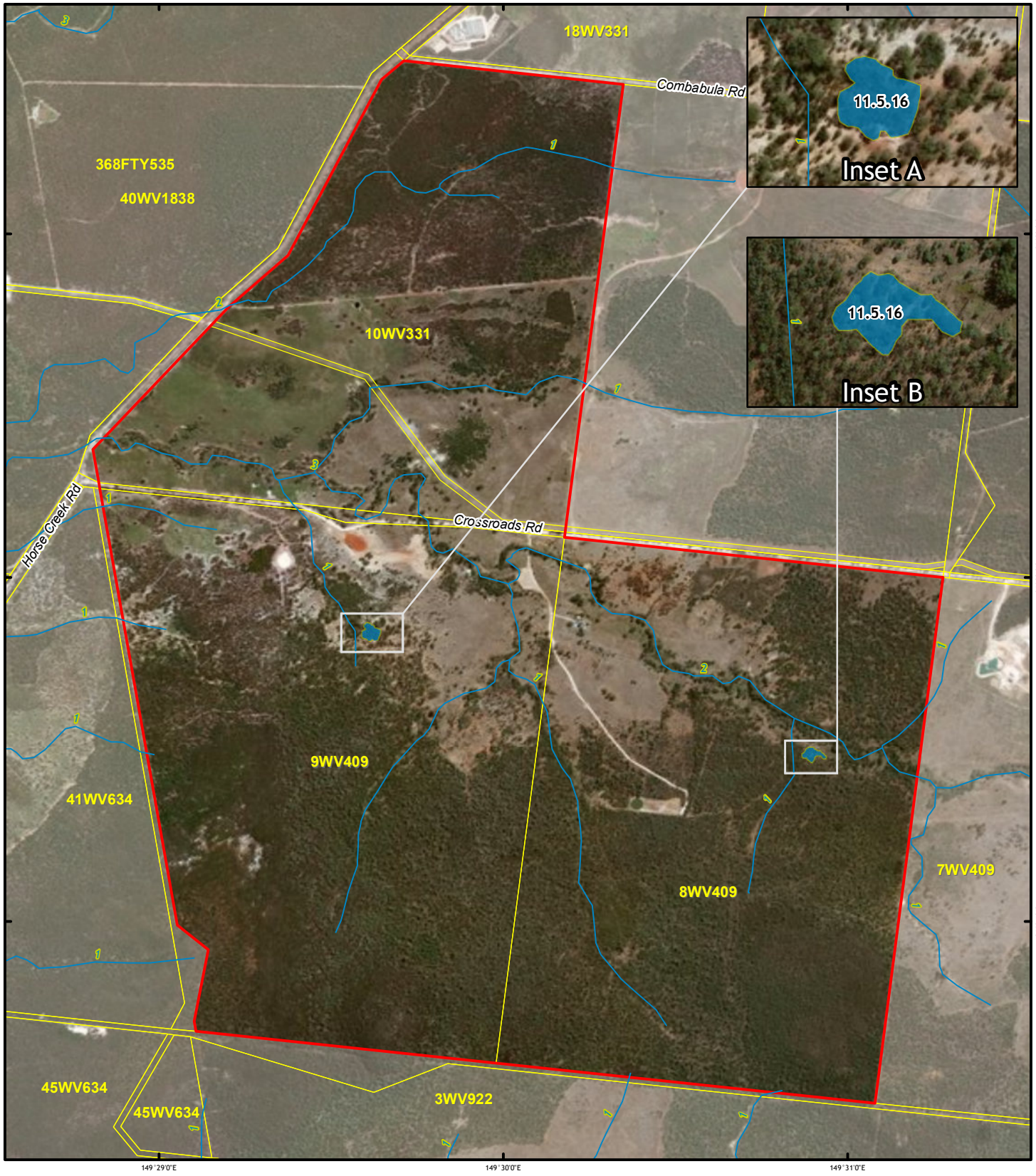
Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Lomandra multiflora	many-flowered mat-rush	LC	-
Loranthaceae	*Amyema cambagei*	-	LC	-
	Amyema miraculosa	-	LC	-
	Lysiana linearifolia	-	LC	-
Malvaceae	*Abutilon otocarpum*	desert lantern	LC	-
	Hibiscus sturtii	hill hibiscus	LC	-
	Sida cunninghamii	ridge sida	LC	-
	Sida hackettiana	spiked sida	LC	-
	Sida rhombifolia	paddy's lucerne	I	-
	Sida rohlenae	shrub sida	LC	-
Meliaceae	*Melia azedarach*	white cedar	LC	-
	Owenia acidula	emu apple	LC	-
Mimosaceae	*Acacia amblygona*	fan wattle	LC	-
	Acacia aprepta	Miles mulga	LC	-
	Acacia conferta	crowded-leaf wattle	LC	-
	Acacia decora	pretty wattle	LC	-
	Acacia excelsa	ironwood	LC	-
	Acacia harpophylla	brigalow	LC	-
	Acacia leiocalyx	early-flowering black wattle	LC	-
	Acacia salicina	sally wattle	LC	-
	Acacia shirleyi	lancewood	LC	-
	Acacia spectabilis	glory wattle	LC	-
Myoporaceae	*Eremophila debilis*	winter apple	LC	-
	Eremophila longifolia	long-leaved emu bush	LC	-
	Eremophila mitchellii	false sandalwood	LC	-
Myrtaceae	*Angophora floribunda*	rough-barked apple	LC	-
	Angophora leiocarpa	smooth-barked apple	LC	-
	Corymbia clarksoniana	Clarkson's bloodwood	LC	-
	Corymbia tessellaris	Moreton Bay ash	LC	-
	Eucalyptus camaldulensis	river red gum	LC	-
	Eucalyptus chloroclada	Baradine red gum	LC	-
	Eucalyptus exserta	Queensland peppermint	LC	-
	Eucalyptus fibrosa	broad-leaved ironbark	LC	-
	Eucalyptus populnea	poplar box	LC	-
	Eucalyptus woollsiana	narrow-leaved gum-topped box	LC	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Melaleuca nodosa	prickly paperbark	LC	-
Nyctaginaceae	*Boerhavia dominii*	tarvine	LC	-
Orchidaceae	*Cymbidium canaliculatum*	black orchid	SLC	-
Pittosporaceae	*Bursaria spinosa*	black thorn	LC	-
Poaceae	*Alloteropsis semialata*	cockatoo grass	LC	-
	Ancistrachne uncinulata	hooky grass	LC	-
	Aristida caput-medusae	many-headed wire grass	LC	-
	Aristida leichhardtiana	-	LC	-
	Aristida ramosa	purple wire grass	LC	-
	Arundinella nepalensis	reed grass	LC	-
	Austrostipa ramosissima	stout bamboo grass	LC	-
	Austrostipa verticillata	bamboo spear-grass	LC	-
	Bothriochloa bladhii	forest blue grass	LC	-
	Bothriochloa decipiens	pitted blue grass	LC	-
	Capillipedium spicigerum	scented-top grass	LC	-
	Cenchrus ciliaris	buffel grass	I	-
	Cenchrus longispinus	spiny burrgrass	I	-
	Chloris divaricata	spreading windmill grass	I	-
	Chloris gayana	Rhodes grass	LC	-
	Chloris ventricosa	plump windmill grass	LC	-
	Chrysopogon fallax	golden beard grass	LC	-
	Cymbopogon refractus	barbed wire grass	LC	-
	Dactyloctenium radulans	button grass	LC	-
	Dichanthium sericeum	Queensland blue grass	LC	-
	Digitaria ammophila	silky umbrella grass	LC	-
	Digitaria brownii	cotton panic grass	LC	-
	Dinebra decipiens	-	LC	-
	Diplachne fusca	brown beetle grass	LC	-
	Echinochloa colona	awnless barnyard grass	I	-
	Enneapogon nigricans	limestone bottlewashers	LC	-
	Enteropogon acicularis	curly windmill grass	LC	-
	Entolasia stricta	wiry panic	LC	-
	Eragrostis elongata	close-headed love grass	LC	-
	Eragrostis lacunaria	purple love grass	LC	-
	Eragrostis parviflora	weeping lovegrass	LC	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
	Eragrostis trichophora	-	I	-
	Eremochloa bimaculata	poverty grass	LC	-
	Eriachne mucronata	mountain wanderrie grass	LC	-
	Eriochloa crebra	cup grass	LC	-
	Eulalia aurea	silky browntop	LC	-
	Heteropogon contortus	black spear grass	LC	-
	Leptochloa digitata	umbrella canegrass	LC	-
	Megathyrsus maximus	guinea grass	I	-
	Melinis repens	red Natal grass	I	-
	Panicum effusum	hairy panic	LC	-
	Panicum queenslandicum	Queensland panic	LC	-
	Paspalidium caespitosum	brigalow grass	LC	-
	Paspalidium distans	spreading panic grass	LC	-
	Perotis rara	comet grass	LC	-
	Setaria paspalidioides	-	LC	-
	Setaria surgens	-	LC	-
	Sporobolus caroli	fairy grass	LC	-
	Sporobolus creber	western rat's tail grass	LC	-
	Themeda avenacea	oat grass	LC	-
	Themeda triandra	kangaroo grass	LC	-
	Thyridolepis mitchelliana	mulga mitchell grass	LC	-
	Tragus australianus	-	LC	-
	Urochloa foliosa	-	LC	-
	Urochloa mosambicensis	sabi grass	I	-
	Urochloa subquadripara	-	I	-
Polygonaceae	*Rumex brownii*	swamp dock	LC	-
Portulacaceae	*Calandrinia pickeringii*	-	LC	-
	Portulaca pilosa	akulikuli	I	-
Proteaceae	*Grevillea striata*	beefwood	LC	-
	Hakea lorea	corkwood	LC	-
	Hakea purpurea	crimson hakea	LC	-
Rhamnaceae	*Alphitonia excelsa*	red ash	LC	-
Rubiaceae	*Psydrax odorata*	shiny-leafed canthium	LC	-
	Psydrax oleifolia	myrtle tree	LC	-
Rutaceae	*Boronia bipinnata*	rock boronia	LC	-
	Geijera parviflora	wilga	LC	-

Class	Scientific name	Common name	Legislative status (*NC Act*, *Biosecurity Act*)	Legislative status (*EPBC Act*)
Santalaceae	*Exocarpos cupressiformis*	cherry ballart	LC	-
	Santalum lanceolatum	sandalwood	SLC	-
Sapindaceae	*Dodonaea biloba*	hopbush	LC	-
	Dodonaea boroniifolia	fern-leaf hopbush	LC	-
	Dodonaea triangularis	triangle-leaf hopbush	LC	-
	Dodonaea vestita	-	LC	-
	Dodonaea viscosa	sticky hopbush	LC	-
Solanaceae	*Solanum esuriale*	potato weed	LC	-
	Solanum nigrum	deadly nightshade	I	-
	Solanum semiarmatum	ginger's whiskers	LC	-
	Solanum stelligerum	devil's needles	LC	-
Stackhousiaceae	*Stackhousia viminea*	slender stackhousia	LC	-
Sterculiaceae	*Brachychiton populneus*	kurrajong	SLC	-
Verbenaceae	*Glandularia aristigera*	Mayne's pest	I	-
	Verbena bonariensis	purple top	I	-
	Verbena litoralis	-	I	-
Violaceae	*Afrohybanthus stellarioides*	orange spade flower	LC	-

Appendix G: Ground Truthed Threatened Ecological Communities



Legend

- Ordered Drainage 100K
- Site
- Ground-truthed Threatened Ecological Communities
- Cadastre

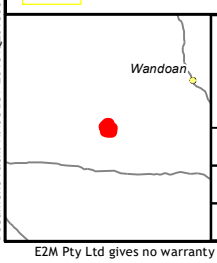
N

Scale 1:29,000 (A4)

0 300 600 900 1,200

Metres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2018
Cadastre: © DNRME 2018
Ordered Drainage: © DNRME 2018
Road: © PSMA 2014

Rev	Description	Drawn	Approved	Date
0	Issued for Use	CD	PW	13/04/2018
B	Issued for Review	CD	PW	09/04/2018

APPENDIX G: THREATENED ECOLOGICAL COMMUNITIES

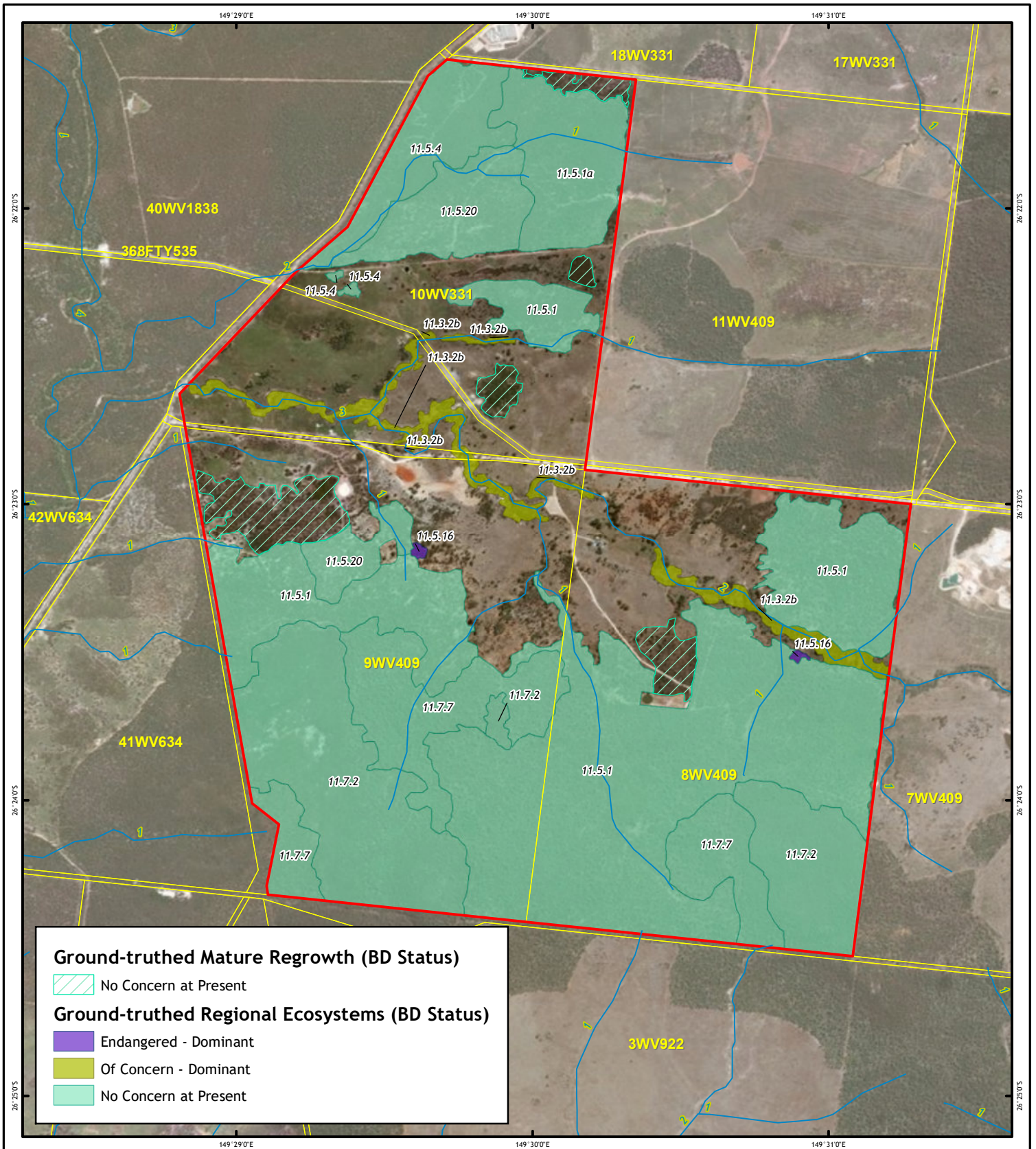
Ecological Assessment
Origin Energy

Map Number	Job Number	Rev
1 of 1	QEJ18008	0

Document Path: X:\JOBS\-2018\QEJ18008\GIS\QEJ18008_APPENDIX_G.mxd

E2M Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability for any loss, damage or costs (including consequential damage) relating to any use of the data in this map.

Appendix H: Ground Truthed Regional Ecosystems



Legend

- Ordered Drainage 100K
- Site
- Cadastre

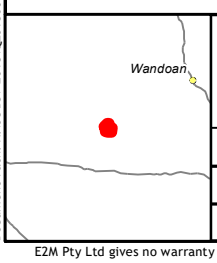
N

Scale 1:32,500 (A4)

0 300 600 900 1,200

Metres

Coordinate System: GCS GDA 1994



Notes:
Aerial Imagery: © ESRI 2018
Cadastre: © DNRME 2018
Ordered Drainage: © DNRME 2018
Road: © PSMA 2014

Rev	Description	Drawn	Approved	Date
0	Issued for Use	CD	PW	13/04/2018
B	Issued for Review	CD	PW	09/04/2018

APPENDIX H: GROUND-TRUTHED REGIONAL ECOSYSTEMS

Ecological Assessment
Origin Energy

Map Number	Job Number	Rev
1 of 1	QEJ18008	0

Document Path: X:\JOBS\-2018\QEJ18008\GIS\QEJ18008_APPENDIX_H.mxd

E2M Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability for any loss, damage or costs (including consequential damage) relating to any use of the data in this map.

Appendix I: Curriculum vitae

Peter Wagner

Ecologist

Professional Summary

A terrestrial ecologist with over eight years of consultant and research experience across a range of projects in central and south east Queensland. He has completed a Bachelor of Science (Ecology and Conservation) and a Master of Science degree (research) in Landscape Ecology, investigating remnant and regrowth Brigalow vegetation in southern Queensland, from the University of Southern Queensland. Peter has developed comprehensive understanding of State and Commonwealth legislation as it pertains to ecology, having undertaken a variety of assessments for a number of clients, particularly in the natural resources sector. Projects and tasks carried out encompass Regional Ecosystem (RE) clarifications (PMAVs and ecological assessments), BioCondition assessments in association with project offset strategies, targeted threatened flora and fauna surveys, local council development applications, environmental approval applications and technical report writing.

Key Skills

- **Terrestrial Ecology Assessment** - baseline flora and fauna surveys, vegetation mapping, pre-clearance surveys, targeted threatened species surveys, and BioCondition/Terrestrial Habitat Quality Assessments for offset strategies;
- **Environmental Impact Assessment** - for roads, rail, energy and resource development;
- **Environmental Approvals** - development of environmental approval documentation including Species Management Plans, EPBC Act referrals, Ecological Assessment Reports, Protected Plant Survey Reports, biosecurity reports; and
- **Biosecurity and Rehabilitation Assessment** - Biosecurity surveys and mapping and rehabilitation monitoring and management plans.

Professional Experience

E2M Pty Ltd

Australia Pacific LNG Project, Surat Basin – Origin Energy

Responsibilities comprised Biosecurity surveys and rehabilitation compliance photo-monitoring assessments of Australia Pacific LNG's pipeline infrastructure and gathering networks in south-east Queensland. The monitoring and surveys were undertaken in accordance with environmental conditions outlined within the Project's Environmental Approvals. Information collected was used to support compliance submissions with the Queensland Government.

Boondooma Dam Spillway Repairs Project – Fulton Hogan

The project involved undertaking a pre-clearance survey to confirm extents of remnant and regulated vegetation and number of *Acacia grandiflora* individuals impacted by required works within the dam spillway. Other associated surveys included fauna habitat pre-clearance survey and a biosecurity assessment.

Fiery Creek Met Mast Ecological Assessment – Tilt Renewables Australia Pty Ltd

The project involved undertaking a field survey and associated reporting to support a development application for a proposed Met Mast and access track. Responsibilities comprised an ecological assessment including remnant and regulated vegetation verification, threatened species searches and habitat assessments and biosecurity survey.

Facility Upgrade Environmental Services, Richlands – Coca Cola Amatil

The project involved undertaking a tree survey and threatened species survey for *Eucalyptus curtisii* requiring removal to support a development application. Associated approval documents were provided to the client in order to obtain and manage the environmental approval requirements for the proposed facility upgrade.

Brisbane City Council 'Wipe out Weeds' Program - Brisbane City Council –

Responsible for conducting weed survey of key reserves managed by Brisbane City Council, in accordance with the local council weed and pest management plans. Assessments included mapping of weed infestations within reserves and associated reporting for each survey event to assist with weed management measures within the reserves.

GHD Pty Ltd

Roma S3 and Fairview Lot 20 Ecological Surveys – Santos GLNG

Responsibilities comprised the assessment of flora and fauna values for well pads and associated flowlines in Santos' Fairview and Roma gasfields. Tasks included Regional Ecosystem verification, vegetation condition assessments (BioCondition), targeted weed and threatened species surveys and watercourse assessments along proposed road and pipeline corridors. Reporting summarised the ecological values for each piece of infrastructure and identified necessary approvals and constraints associated with construction corridors.

Protected Plant Flora Surveys – Brisbane City Council

Responsible for undertaking flora surveys for various proposed developments within the Brisbane City Council Shire, in accordance with the Queensland Department of Environment and Heritage Protection (EHP) Protected Plant Flora Survey Guideline. Key projects included the Darra railway station bikeway link, and associated road upgrades and developments at Cooparroo, Kenmore and Chandler. Reports were completed for submission to EHP for assessment under the guideline and associated species-specific Impact Management Plans provided where necessary.

Progress Road Stage 4 Ecological Assessment – Brisbane City Council

Responsible for conducting ecological surveys along the proposed road corridor and surrounds, particularly in relation to its use as a fauna movement corridor. Duties included Regional Ecosystem verification of vegetation on the site, targeted threatened species surveys and identification of fauna habitat features.

The Ecological Assessment Report identified environmental constraints and recommendations in regards to potential fauna infrastructure that could be incorporated into the design to improve connectivity in the landscape.

Fairview GLNG Project Ecological and Pre-Clearance Assessments - Fluor

Responsibilities included co-ordination of teams and completion of environmental assessments at Santos' remote Fairview gas-fields, road and pipeline construction corridors in accordance with the Projects' approval conditions. Assessments undertaken comprised watercourse, Regional Ecosystem clarifications, targeted threated species surveys and pre-disturbance ecology assessments in accordance with stringent construction schedules. Technical reporting summarising field assessments were then used to advise relevant construction and operational teams of required approvals and compliance under the Projects' Environmental Authority.

Carmichael Coal Mine Off-site Infrastructure Ecological Assessment – Adani Mining

Contracted by Adani Mining to assess the proposed offsite infrastructure area, including a rail loop and camp infrastructure associated with the Carmichael Coal Mine. The Assessment included a desktop search and comprehensive field surveys, including quaternary surveys, BioCondition assessments of remnant and regrowth vegetation communities and fauna trapping and nocturnal surveys. In addition to an environmental report, environmental approvals including a Property Map of Assessable Vegetation and a Property Vegetation Management Plan were also required for the project.

Fairview, Yuleba North and Eurombah Environmental Impact Statements – Powerlink Queensland

Assessment of environmental values along proposed alignments were required for Fairview, Yuleba North and Eurombah gas fields to support ongoing GLNG and APLNG Coal Seam Gas (CSG) activities. Responsibilities comprised ecological assessments of vegetation (Regional Ecosystem verification), targeted threatened species searches, weed locations and fauna habitat values along the proposed transmission line corridors. Information collected from desktop and field assessments were incorporated into the Environmental Impact Statement associated for each transmission network.

Archerfield Revegetation Management Plan – Brisbane City Council

The Project involved a comprehensive desktop assessment and site visit to identify existing ecological values of a wetlands area adjacent to the Archerfield airport and potential impacts and constraints associated with revegetation of the site. To reduce the likelihood of increased bird-strike in the adjacent airport resulting from rehabilitation efforts, a risk-based assessment was undertaken. Changes to the proposed BCC strategy based on the risk assessment and discussion of potential mitigation measures to reduce residual risk associated with the Project.

Employment History

- **E2M Pty Ltd** - Ecologist 2015 to Current
- **GHD Pty Ltd** - Ecologist 2012 to 2015
- **University of Southern Queensland** – Teaching and Research Assistant 2010 to 2015

Education

- Master of Science (Research), University of Southern Queensland.
- Bachelor of Science (Ecology and Conservation Biology), University of Southern Queensland.

Publications

Wagner, Peter, M. (2011) Regrowth vegetation in production landscapes: Comparisons between remnant and regrowth Brigalow (Acacia harpophylla), southern Queensland (MSc thesis), University of Southern Queensland, Toowoomba.

Wagner, Peter M. and Le Brocque, Andrew F. (2010) Chalk and cheese or something in between: comparisons between remnant and regrowth Acacia harpophylla communities, western Darling Downs, Queensland. In: Ecological Society of Australia Annual Conference 2010 (ESA 2010): Sustaining Biodiversity - the next 50 Years, 6-10 Dec 2010, Canberra, ACT. Oral Paper

Le Brocque A.F., G. Cockfield & Wagner P. (2008) Vegetation changes following the exclusion of grazing in the Traprock region. University of Southern Queensland, Traprock Wool Association Inc., Toowoomba, Australia. Final Report to Land & Water Australia as part of the Pasture and habitat monitoring for grazing management project.

Le Brocque, A. F. and Wagner, P. M. (n.d.) Passive brigalow (Acacia harpophylla) woodland regeneration fails to recover floral composition in an agricultural landscape. *Austral Ecology* – accepted, awaiting publication.

Other Qualifications/Certifications

- Member of the Ecological Society of Australia (ESA)
- Department of Sustainability, Environment, Water Population and Community (SEWPAC, now Department of Environment and Energy) Santos GLNG Project – Flora and Fauna
- Member of the Environment Institute of Australia and New Zealand (EIANZ)
- Oberonia Botanical Services - Introduction to the Regional Ecosystem Framework (2016)
- Oberonia Botanical Services – BioCondition V2.2 Application, Assessment and Scoring (2016)
- Clean and Inspect Machinery Hygiene Certification (2016)
- General Safety Induction (Construction Industry), Australian Training and Safety Institute Ltd (2012)