

## **EA APPLICATION SUPPORTING REPORT**

**SAVANNAH GOLDFIELDS LTD**

**Appendix 7 Aquatic Vertebrates Assessment (C&R Consulting, 2022)**



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## AGATE CREEK GOLD MINE



### Aquatic Vertebrate Assessment

Report Prepared for:



Date:  
July 2022

CLIENT: WULGURU TECHNICAL SERVICES  
PROJECT: AGATE CREEK GOLD MINE  
REPORT: AQUATIC VERTEBRATE ASSESSMENT  
DATE: JULY 2022



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## SUMMARY OF RELEVANT INFORMATION

|                          |                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------|
| Project Title            | Agate Creek Major EA Amendment:<br>Supporting Studies – Aquatic Vertebrate<br>Assessment          |
| Property Location        | ML100030                                                                                          |
| Property Description     | Gold mine                                                                                         |
| Project Purpose          | Assessment of aquatic vertebrate<br>communities across the Agate Creek<br>Gold Mine project site. |
| Project Number           | 21108                                                                                             |
| Client's Details         |                                                                                                   |
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# 1. INTRODUCTION

## 1.1 PROJECT OVERVIEW

Wulguru Technical Services Pty Ltd (WTS) has been contracted by Laneway Resources Pty Ltd (Laneway) to manage a major environmental authority (EA) amendment for Agate Creek Gold Mine (ACGM). This amendment aims to increase ACGM's production from ~10,000 tpa to ~250,000 tpa. Several scientific studies are required to support the proposed amendment application and the associated environmental assessment report (EAR).

ACGM is situated in the upper Gilbert River catchment area, approximately 45 km south-southwest of Forsayth and 344 km west-northwest of Townsville in north Queensland (Figure 1). Agate Creek runs through the middle of the project site, with several smaller drainage lines entering the main watercourse within the mining lease. Therefore, an impact assessment of the aquatic ecology values associated within these systems is required to support the EAR. WTS currently conducts a receiving environment monitoring programme (REMP) on behalf of Laneway throughout the mining lease area, collecting background water quality, sediment quality and macroinvertebrate community data. WTS have contracted C&R Consulting Pty Ltd (C&R) to undertake aquatic vertebrate surveys and an assessment of potential impacts to these fauna communities to support the EAR.

This document details the aquatic vertebrate communities likely utilising the watercourses associated with the ACGM expansion project and determines potential impacts associated with the proposed activities – while outlining mitigation measures to reduce the risks posed by the identified potential impacts.

## 1.2 SCOPE

This document presents an assessment of the aquatic vertebrate communities associated with the ACGM expansion project – as required to support the aquatic ecology impact assessment component of the EAR. The assessment includes the following scope of works:

- Description of the background environmental setting of the project site with respect to the local and regional waterways;
- Review and assessment of state and federal legislative requirements, guidelines and standards associated with aquatic ecosystems and potentially triggered by the proposed project;
- Review of relevant (publicly available) aquatic vertebrate surveys undertaken in the region to provide a regional setting;
- Dry season field investigation into aquatic habitats, fish communities, turtle communities and other aquatic vertebrate communities present;
- Assessment of collected data and literature review information to determine the aquatic vertebrate values relevant to the project and the potential for (state and federally) listed species and communities to be impacted by the project;
- Assessment of the contribution of the project to cumulative impacts in the region; and
- Determination of appropriate mitigation measures to reduce the risk associated with any identified potential impacts.

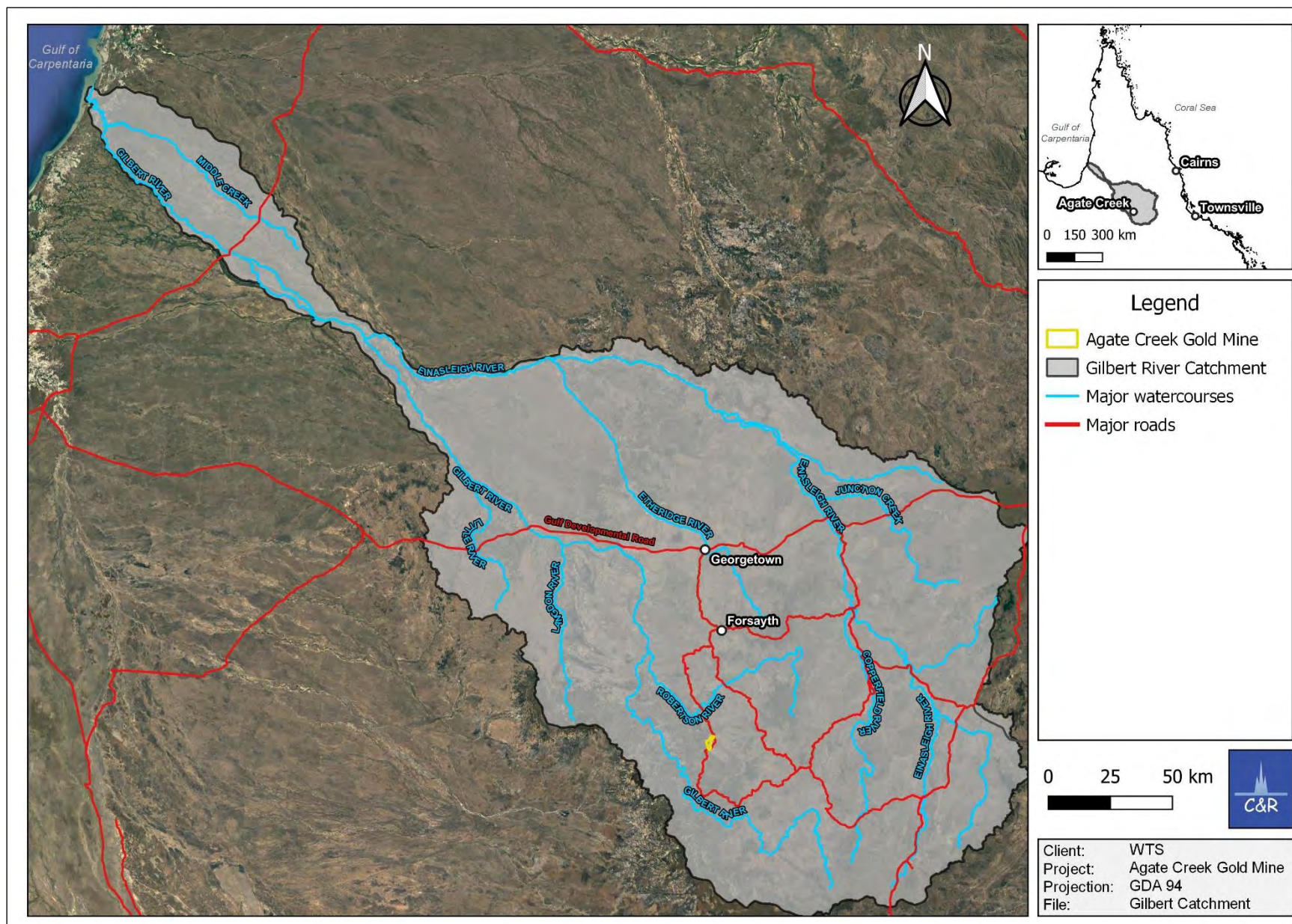


Figure 1: Project site location.

## 2. REGIONAL SETTING

### 2.1 SURFACE WATERS

The mining lease covers an area of approximately 688.86 ha within the mid-catchment area of Agate Creek – a tributary of the Robertson River which flows into the Gilbert River before entering the Gulf of Carpentaria (Figure 1). The mining lease also encompasses several smaller drainage lines branching into Agate Creek – and north into Cave Creek. Cave Creek joins Agate Creek upstream of the confluence with the Robertson River (Figure 2).

The watercourses throughout the project site range from intermittent to highly ephemeral, with smaller drainage lines only flowing for short periods after substantial rainfall events. Although small, semi-permanent pools are known to exist upstream of the project site, there are no naturally occurring large, permanent waterbodies known within the Agate Creek catchment area upstream of the project site. Therefore, aquatic vertebrates inhabiting these upper reaches must recolonise the area from downstream permanent refugia during flow events in the wet season each year.

A large farm dam has been constructed in one tributary of Agate Creek immediately upstream of the project site boundary. Although this system has the potential to act as a refuge for aquatic fauna and flora during dry periods, it had only been recently installed and its ability to support the upper reaches of Agate Creek through recruitment is not well understood.

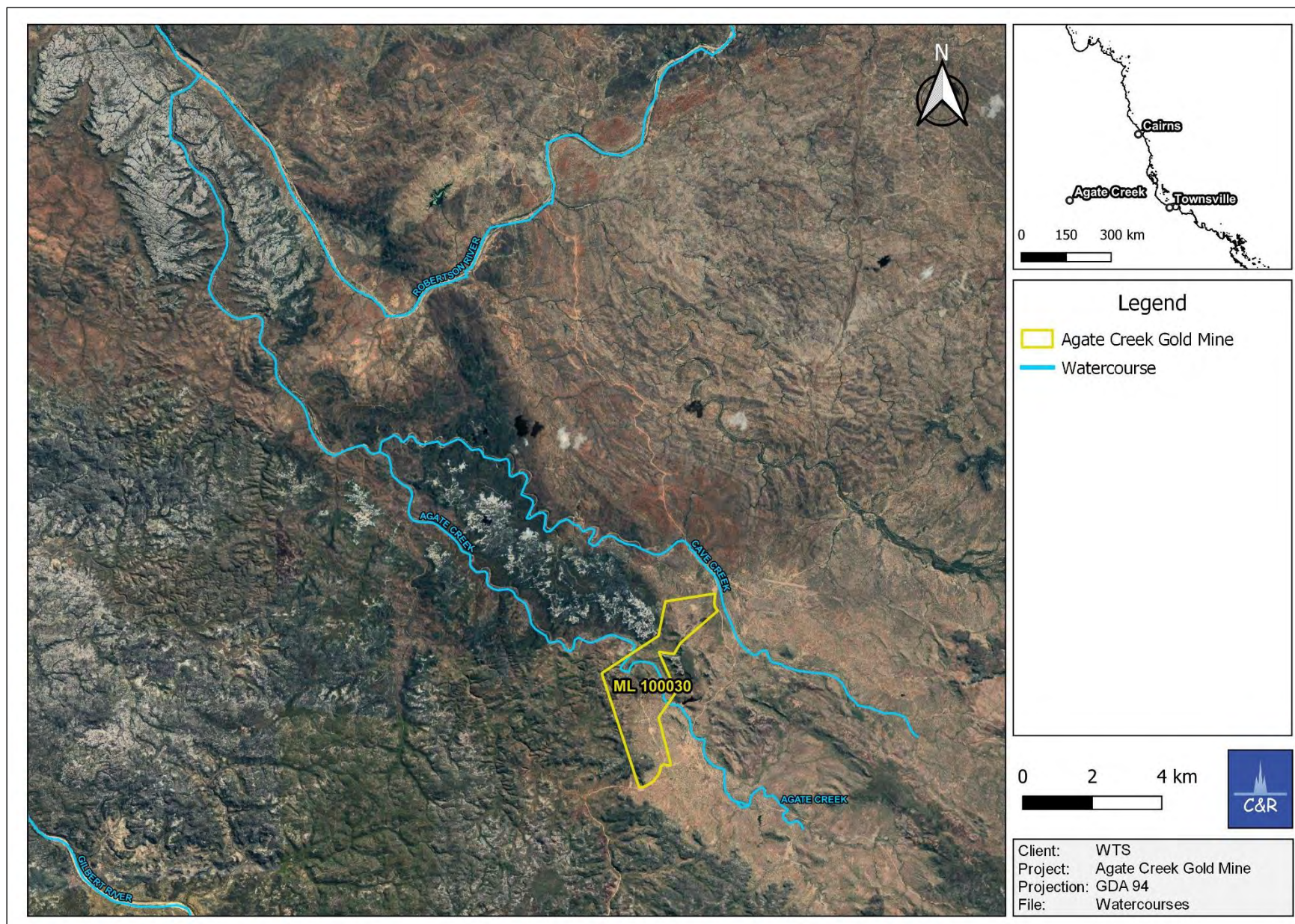


Figure 2: Project site and associated watercourses.

## 2.2 ENVIRONMENTAL VALUES

The *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP) outlines the framework for determining the environmental values of a catchment/watercourse. To date, no environmental values have been determined for the Robertson River sub-basin (which includes Agate Creek) by the administering authority. Therefore, the EPP states that the following environmental values may apply to surface waters within the region:

- Slightly disturbed (SD) aquatic ecological values because the biological integrity of the creek has likely been modified by historical cattle grazing practices experienced throughout the region;
- Agricultural purposes (e.g. irrigation, stock watering, etc.);
- Aquaculture;
- Human consumer;
- Primary recreation;
- Secondary recreation;
- Visual recreation;
- Drinking water;
- Industrial use; and
- Cultural and spiritual values.

Any water quality objectives (WQOs) developed for the project must ensure the protection of the environmental values outlined above. WQOs can include physico-chemical, biological (e.g. macroinvertebrate and fish) as well as riparian parameters to ensure the conservation of environmental values in both surface and groundwater flows. No WQOs have been developed for the area by the administering authority. Although best-practice WQOs can be drawn from the Australian and New Zealand Environment and Conservation Council (ANZECC) and Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ) guidelines (ANZECC and ARMCANZ, 2000) for the vast majority of these environmental values, it is highly recommended that site-specific guideline values be developed in accordance with the Department of Environment and Heritage Protection (DEHP, 2009) methods.

## 2.3 CLIMATE

Agate Creek is located within the seasonally arid tropics, with the area dominated by intense rainfall events throughout the summer months. These rainfall events are often highly variable in their spatial and temporal distribution, with the majority of the rain falling in distinct, spatially separated cells across the landscape. Rainfall throughout the remainder of the year is generally limited to an occasional shower in June or July and evaporation tends to exceed rainfall for almost all days of the year, with the exception of periods with intense rainfall events.

The median annual rainfall experienced in the region is 753.2 mm, with approximately 98% of the rain falling between November and April each year (based on 17 years [2005 – 2021] of data from Bureau of Meteorology (BOM) station 30124 at the Georgetown airport; BOM, 2022).

The 2020/2021 wet season rainfall totals were well above the long-term median for most months (Figure 3). March 2021 was the only exception (44.6 mm), recording 19.2 mm less rainfall than average. Above-average rainfall was also obtained at the beginning of the subsequent (2021/2022) wet season, with November (131.6 mm) recording 100 mm more rainfall than the monthly average (31.0 mm) of the region. No rainfall was registered throughout May to mid-August, which is typical for the region. The total rainfall over the 12

months prior to sampling (1001.2 mm from November 2020 to October 2021) was well above the historical annual median (753.2 mm).

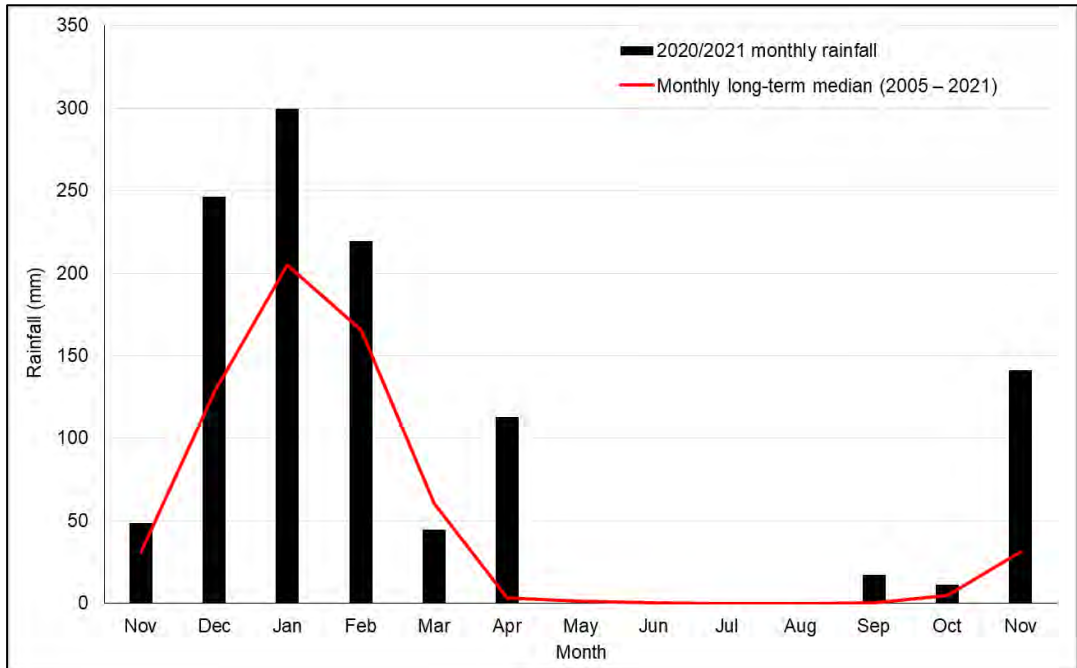


**Figure 3: Monthly rainfall totals from November 2020 to November 2021 compared against the long-term monthly average (2005 – 2021; BOM station 30124).**

Historical temperatures (2005 – 2021; BOM, 2022) at Agate Creek range from 9.6°C to 43.1°C during the wet season and 0.5°C to 41.6°C during the dry season (BOM, 2022). The temperature data show marginal variation throughout the year, generally increasing in September and October each year with the 'build-up' to the monsoonal wet season, easing after the wet season (Figure 4).

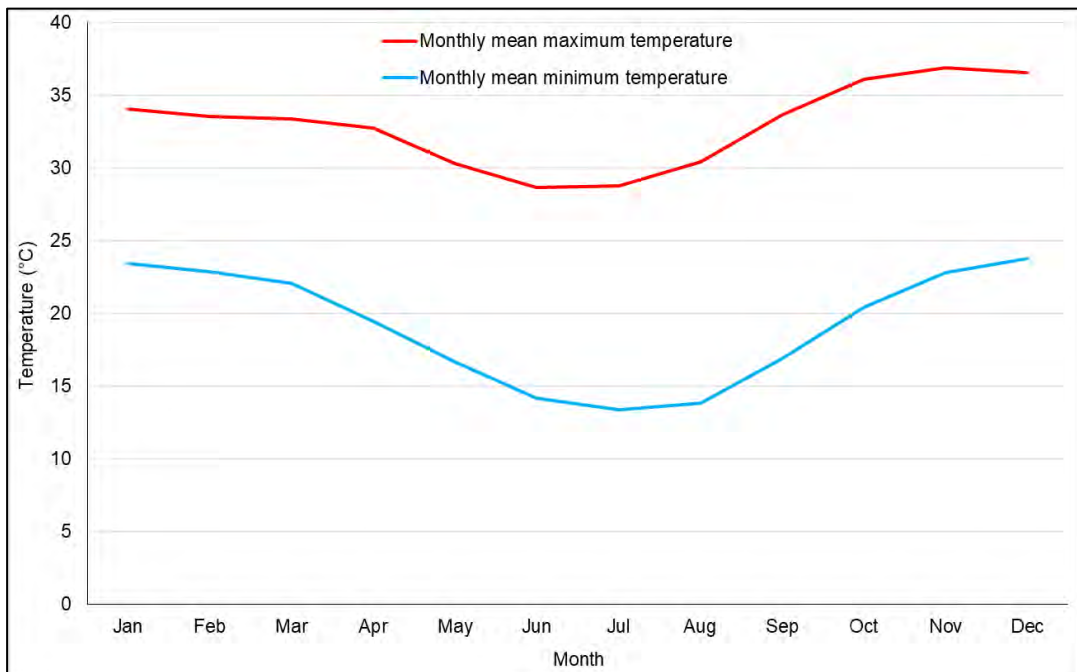


**Figure 4: Mean monthly temperature variation typically experienced throughout the year (2005 – 2021; BOM station 30124).**

## 2.4 SURFACE GEOLOGY

The Agate Creek deposit is located in the central portion of the Proterozoic Etheridge Province. These Proterozoic Etheridge metamorphic rocks were extensively intruded by Silurian to Early Devonian granitoid batholiths, and dominantly felsic Carboniferous to Early Permian magmatic complexes (Morrison et al., 2019). The mineralisation at Agate Creek is related to the emplacement of Permo-Carboniferous porphyritic rhyolite and andesite extrusives and intrusives, commonly referred to as the Agate Creek Volcanic Group.

Gold mineralisation at Agate Creek is hosted by a low sulphidation, epithermal system consisting of quartz-chalcedony veining, stockwork and breccia. Host rock lithology is predominantly porphyritic rhyolite or andesite that occupy shallow, south-east dipping thrust faults in Silurian granodiorite (Morrison et al., 2019). This host rock is principally volcanic in origin.

A series of complex hydrothermal alteration assemblages surround the Agate Creek ore body. These assemblages range from a distal ubiquitous propylitic zone (chlorite +/- carbonate-epidote-pyrite-haematite) grading inwards to a more proximal variably argillic to sericitic zone (clay +/- quartz-sericite-pyrite) and locally phyllic zone (silica +/- pyrite or iron oxide) (Morrison et al., 2019). Most of the hydrothermal alteration in the Agate Creek expansion area is predominantly clay +/- silica, sericite and/or pyrite (now weathered to iron oxide).

## 2.5 SOIL PROPERTIES

The Atlas of Australian Soils (<https://www.asris.csiro.au/themes/Atlas.html>) – compiled by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) – provides a baseline description for regional soils found in and around the Agate Creek mining lease. The primary soil type found around the mine is a tenosol, specifically LL8 (Figure 5), characterised by low-hilly to hilly lands with abundant schistose rock outcrop.

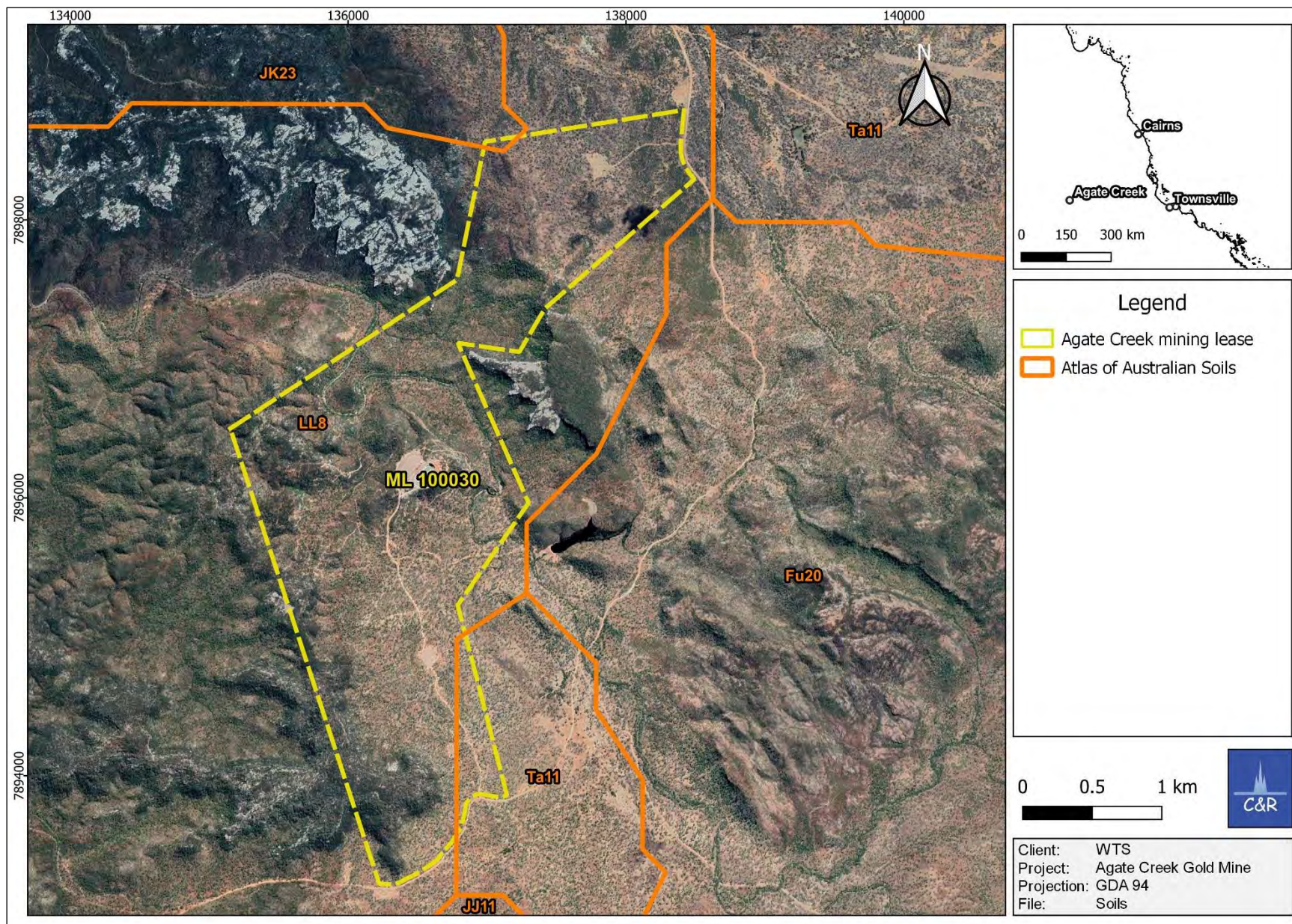


Figure 5: Soil types associated with the project site.

### 3. RELEVANT REGULATORY FRAMEWORK

The legislation, policies and regulations which are considered to be relevant to the management of aquatic vertebrates in the project site are discussed in the following sections and include:

- The Commonwealth *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* (EPBC Act) and associated offsets policy;
- Ramsar and nationally important wetlands;
- The Queensland *Nature Conservation Act 1992* (NC Act);
- The QLD *Fisheries Act 1994* (Fisheries Act) and associated regulations; and
- The QLD *Water Act 2000* (Water Act) and associated regulations.

#### 3.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 (EPBC ACT)

The Commonwealth Department of Agriculture, Water and the Environment (DAWE) administers the EPBC Act. Any action likely to have a significant impact on a matter of national environmental significance (MNES) is subject to assessment under the EPBC Act approval process.

The MNES of relevance to the aquatic ecology impact assessment are:

- Listed threatened species and communities; and
- Migratory species.

Threatened species and communities – as well as migratory species listed under the EPBC Act – that have the potential to inhabit the freshwater habitats occurring across the project site were considered in this assessment. The likelihood of occurrence of these MNES within the aquatic ecology study area was determined via a combination of desktop review of historical studies and the completion of targeted field surveys. The results of this assessment are detailed in Section 5, with the possible impacts to any MNES identified as potentially occurring within the study area detailed in Section 6.

#### EPBC ACT OFFSETS POLICY

##### 3.1.1

The EPBC Act *Environmental Offsets Policy (2012)* requires the provision of offsets to compensate for significant residual impacts to MNES. The policy defines an offset package as a “*suite of actions that a proponent undertakes in order to compensate for the residual significant impact of a project*” (Department of Sustainability, Environment, Water, Population and Communities [DSEWPoC], 2012). An offset can be in the form of a direct offset or other compensatory measure.

#### INTERNATIONALLY (RAMSAR) AND NATIONALLY IMPORTANT WETLANDS

##### 3.1.2

Internationally important wetlands are identified under the Ramsar Convention, an international cooperative designed to conserve wetlands. Signatories (of which Australia is one) to the Ramsar Convention (also known as the *Convention on Wetlands of International Importance*) aim to halt the worldwide loss of wetlands and conserve the unique systems that remain. Ramsar wetlands are those that are representative, rare or unique wetlands, or

are important for conserving biological diversity. Within Australia, Ramsar wetlands (or internationally important wetlands) are protected under the EPBC Act.

Nationally important wetlands are determined via a set of six criteria (generally applied by state and territory regulatory bodies) of which a wetland must meet at least one to be regarded as 'nationally important'. Once declared a nationally important wetland, the biological, ecological and hydrological information associated with the wetland is documented within the Directory of Important Wetlands in Australia (DIWA). Nationally important wetlands are not protected under the EPBC Act, but may be protected under corresponding state or territory legislation.

DIWA, managed by DAWE, is an online database that lists internationally and nationally important wetlands. The directory provides data and information about important wetlands on which to base management decisions. A search of DIWA was undertaken for this study to determine the potential for internationally (Ramsar) or nationally important wetlands to occur on or downstream of the project site. No nationally or internationally important wetlands are recorded in the region (Section 5.1).

## **3.2 QUEENSLAND LEGISLATION AND GUIDELINES**

### **3.2.1 QUEENSLAND NATURE CONSERVATION ACT 1992 (NC ACT)**

The Queensland NC Act provides the framework to regulate any actions with the potential to impact protected areas (e.g. national parks) and/or protected flora and fauna listed under the *Nature Conservation (Wildlife) Regulation 2006*. The NC Act allocates protected fauna into several categories dependent on the level of management required to ensure their conservation, including:

- Extinct in the wild;
- Endangered;
- Vulnerable;
- Near-threatened; and
- Least concern.

The results of the desktop review into the potential of NC Act listed species to inhabit the project site are detailed in Section 5.

### **3.2.2 QUEENSLAND FISHERIES ACT 1994 (FISHERIES ACT)**

The Fisheries Act regulates the management, use, development and protection of fisheries resources and fish habitats. This act is administered by the Department of Agriculture and Fisheries (DAF).

Development permits under the *Planning Act 2016* (Planning Act) are required prior to:

- Constructing any waterway barrier works (i.e. structures such as culverts, road crossings, dams, etc.) that may inhibit fish passage.
- Undertaking any development within a fish habitat area (FHA) as declared under the Fisheries Act.

The DAF has prepared mapping which classifies all waterways in Queensland in relation to the level of risk that waterway barrier works could pose to fish movement and fish communities (DAF, 2014). This mapping is used for projects that require approvals under the Planning Act to assist proponents in determining the level of assessment that is required. However, the activities being assessed for the project will be undertaken within the proposed mining lease boundary – and in accordance with the EA that will be obtained for the project.

The Planning Act does not apply to activities undertaken within a mining lease and in accordance with an EA and there is consequently no need to obtain separate approvals/permits for waterway barrier works. The DAF's waterway mapping is, therefore, not directly relevant to the project, given that approval under the Planning Act is not required. Nevertheless, the DAF's waterway mapping provides useful background information about Agate Creek, Cave Creek and their associated tributaries. The mapping indicates that waterway barrier works would pose a major risk to fish passage within Agate Creek and Cave Creek (Figure 6). Section 5.2 discusses potential fish communities inhabiting the watercourses associated with the project site. Their requirement to access upstream areas of Agate Creek is discussed further throughout Section 5.2.

FHAs aim to provide long-term protection for fish habitats that are considered essential to sustaining local, commercial and recreational fisheries. These areas align with the protected area Category VI (*Protected area with sustainable use of natural resources*) under the International Union for the Conservation of Nature and Natural Resources (IUCN) framework. There are 72 mapped FHAs along the Queensland coast. FHAs are considered a matter of state environmental significance (MSES). No FHAs are mapped within or in close proximity to the project site.

### **3.2.3 QUEENSLAND WATER ACT 2000 (WATER ACT)**

The Water Act provides for the sustainable management of water resources – as well as any other resources with the potential to impact water resources. This is achieved through a range of processes, including the establishment and operation of water authorities. Under the Water Act, any potential works that will destroy vegetation, excavate or place fill within a watercourse, lake or spring will require a riverine protection permit application. Mining operations may be exempt from obtaining a riverine protection permit under the '*Guideline: Activities in a watercourse, lake or spring associated with mining operations*', provided works are consistent with the guideline.

The Water Act also provides for the identification of watercourses and drainage features on the Watercourse Identification Map (WIM) – or declaration of a watercourse by the administering authority.

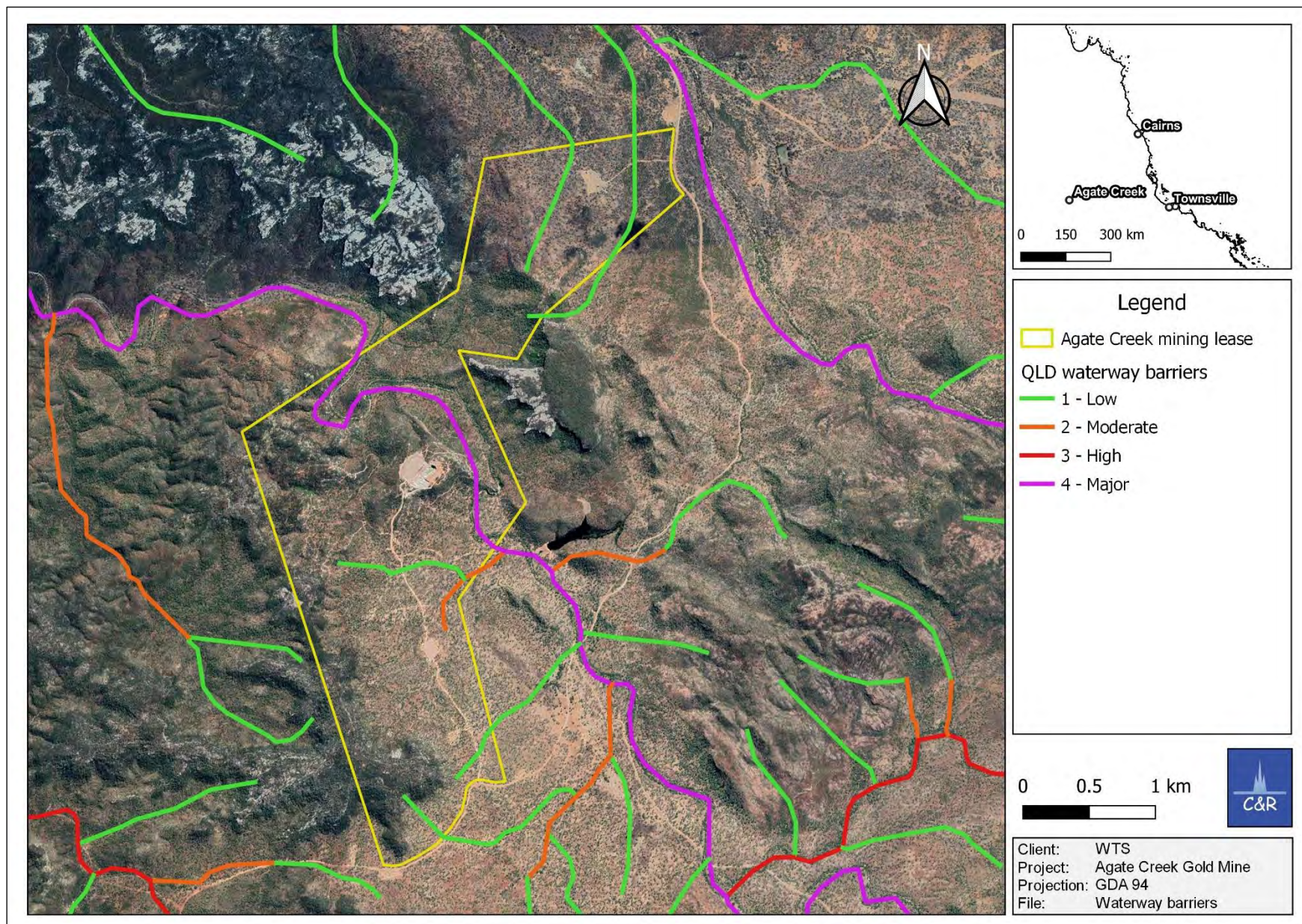


Figure 6: Waterway barrier works risk mapping.

## 4. METHODS

### 4.1 DESKTOP STUDY

#### 4.1.1 DATABASE SEARCHES

Database searches for this study targeted listed aquatic flora, fauna and communities previously documented in the area – as well as known wetlands of importance. Utilised search engines included:

1. The EPBC *Protected Matters Search Tool* (2022), which targets EPBC Act species and communities. Search parameters utilised a centroid point placed within the project site, with a 20 km buffer.
2. The *Atlas of Living Australia* (ALA), which details all species records for the area. However, this source is only based on data contributed to the website and also relies on unvetted citizen scientists. Search parameters utilised a centroid point placed within the project site, with a 10 km buffer (this was the largest buffer allowed on this website).

The database search results are summarised in Section 5, with the complete search reports / produced maps provided in Appendix A.

#### 4.1.2 LITERATURE REVIEW

A literature review was conducted of all available studies that have previously assessed aquatic ecology and surface water ecosystems within the region. Each component targeted in the field surveys (e.g. aquatic habitat, water and sediment quality, aquatic flora and fauna) was reviewed. This background information provided valuable insight when preparing field surveys and assisted in the ability to target specific areas/habitats within each watercourse.

Reviewed reports included:

- Vallance, TD., Hogan, A., Peterken, C.J. (2000) *Scoping report - Gulf Rivers dams and weirs*. Department of Primary Industries. Queensland Government, Walkamin.
- Burrows, D. (2008) *Report 7: Freshwater Fish*. In: Lukacs, G.P., Finlayson, C.M. (Eds.) *A Compendium of Ecological Information on Australia's Northern Tropical Rivers*. Sub-project 1 of Australia's Tropical Rivers – an integrated data assessment and analysis (DET18). A report to Land & Water Australia. National Centre for Tropical Wetland Research, Townsville, Queensland, pp. 20.
- Waltham, N., Burrows, D., Butler, B., Wallace, J., Thomas, C., James, C., Brodie, J. (2013) *Waterhole ecology in the Flinders and Gilbert catchments*. A technical report to the Australian Government from the CSIRO Flinders and Gilbert Agricultural Resource Assessment, part of the North Queensland Irrigated Agriculture Strategy. CSIRO Water for a Healthy Country and Sustainable Agriculture flagships, Australia.
  - \*Ecowise (2007) *Aquatic fauna survey of the Northern Gulf region – June 2006*. Brisbane, Ecowise Environmental Pty Ltd. \*Please note that this report was not available but was included in the desktop review of fish records for the Gilbert catchment in Waltham et al. (2013). The results from this study are included, where appropriate.

Information collected during the literature review on each component of the study is discussed in Section 5. This procedure aided in determining the background (existing) aquatic vertebrates occurring across the project site – as well as in upstream and downstream areas. This literature review is an essential part of the study because the

processes – and the potential connectivity of the project site to other areas – must be determined in order to assess the implications of any proposed activities on the regional aquatic environments.

## **4.2 FIELD SURVEY**

Appropriate permits from the Queensland Government were obtained to conduct research on the targeted fauna, including:

- Scientific purposes permit (Permit Number: WA0006466);
- General fisheries permit (Permit Number: 253191); and
- QLD DAF animal ethics approval (Reference Number: CA2020/02/1354).

### **4.2.1 KEY PERSONNEL**

Two C&R personnel undertook the aquatic ecology surveys across the study area:

1. Matthew Knott (BSc (Hons)); Member of the Environment Institute of Australia and New Zealand [EIANZ]) – Senior Scientist / Project Manager

Matt has over 15 years of experience undertaking aquatic ecology surveys throughout Queensland, the Northern Territory and New South Wales, with a particular focus on Cape York Peninsula and the Gulf of Carpentaria. In a previous role, as a research scientist with the Australian Centre for Tropical Freshwater Research (ACTFR; now referred to as TropWATER), Matt assisted with freshwater fish surveys throughout the Cape York Peninsula and the Gulf of Carpentaria as part of the Northern Australian Freshwater Fish (NAFF) project. Matt is also a member of EIANZ.

2. Moe Maki (MSc) – Environmental Scientist

Moe has Master of Science (Professional) from James Cook University, where he established a keen interest in the application of ecological and spatial science techniques and technologies in solving complex environmental issues. Moe's background in marine science has made him familiar with ecological, environmental and geological survey methods in a variety of ecosystems, including coral reefs, wetlands, mangroves and aquatic environments. Further, Moe has a high level of computer literacy and is skilled in the use of many statistical software packages. Since commencing with C&R, Moe has continued to broaden his extensive skill set through involvement with a wide range of projects – including the monitoring of groundwater and surface water quality, aquatic ecology impact assessments, contaminated land assessments, long-term ecological monitoring and mine environmental compliance issues.

### **4.2.2 TIMING**

Based on project timelines, only dry season surveys were able to be undertaken prior to submission of the EA amendment application. Therefore, field surveys were conducted in late-November 2021, at the end of the dry season.

### **4.2.3 SITE SELECTION**

Sampling sites were located based on different habitat types present within a watercourse (e.g. pool, deep bend, backwater, macrophyte bed, riffle and/or run), proposed project layout and accessibility for sampling. Potential sampling sites were determined through an assessment of aerial photographs, available information on proposed site infrastructure and site boundaries. Detailed review of the aerial photographs resulted in the identification of

key habitat types within each watercourse that were then assessed (ground-truthed) during the field assessment.

A total of fifteen sites were targeted to characterise the aquatic vertebrate communities inhabiting Agate Creek and its major tributaries within the project site (Figure 7), including:

- Four sites located within the main channel of Agate Creek;
- One site located in a large farm dam off site (AC9); and
- Ten sites located in small, highly ephemeral drainage lines that traverse the project site.

#### **4.2.4 FISH AND LARGE MACROINVERTEBRATE COMMUNITIES**

Fish communities were surveyed using a combination of backpack electrofishing, baited traps and dip nets, dependent on habitat type present.

Backpack electrofishing (using a Smith-Root LR-24) was the preferred sampling technique and was primarily used (where appropriate). Baited traps were employed at AC9 to target fish, crustaceans and freshwater turtles. This included replicate samples of collapsible box traps (2 mm mesh), opera house traps (1.5" mesh) and cathedral traps. A full account of the effort employed at each site is detailed in Table 1.

Collected fish were enumerated, identified, measured (to determine life history stage) and photographed.

Freshwater fish surveys were conducted in accordance with the methods developed for the NAFF atlas project (NAFF, 2007; a collaboration between the National Centre for Tropical Wetland Research and Griffith University), the survey guidelines for Australia's threatened fish (DSEWPaC, 2011; where appropriate) and in accordance with the *Australian Code of Electrofishing Practice 1997*, under the animal ethics approval CA2020/02/1354 and general fisheries permit 253191.

##### ***Data Analysis***

The following fish and large macroinvertebrate parameters were analysed for each of the sites sampled:

- Species richness;
- Total abundance;
- Abundance of listed aquatic species;
- Abundance of exotic species;
- Abundance of each life history stage present (i.e. juvenile, intermediate or adult); and
- Mean fork length.

Note: Fork length is a measurement of fish length taken from the tip of the snout of the head to the deepest point in the notch of the tail fin.

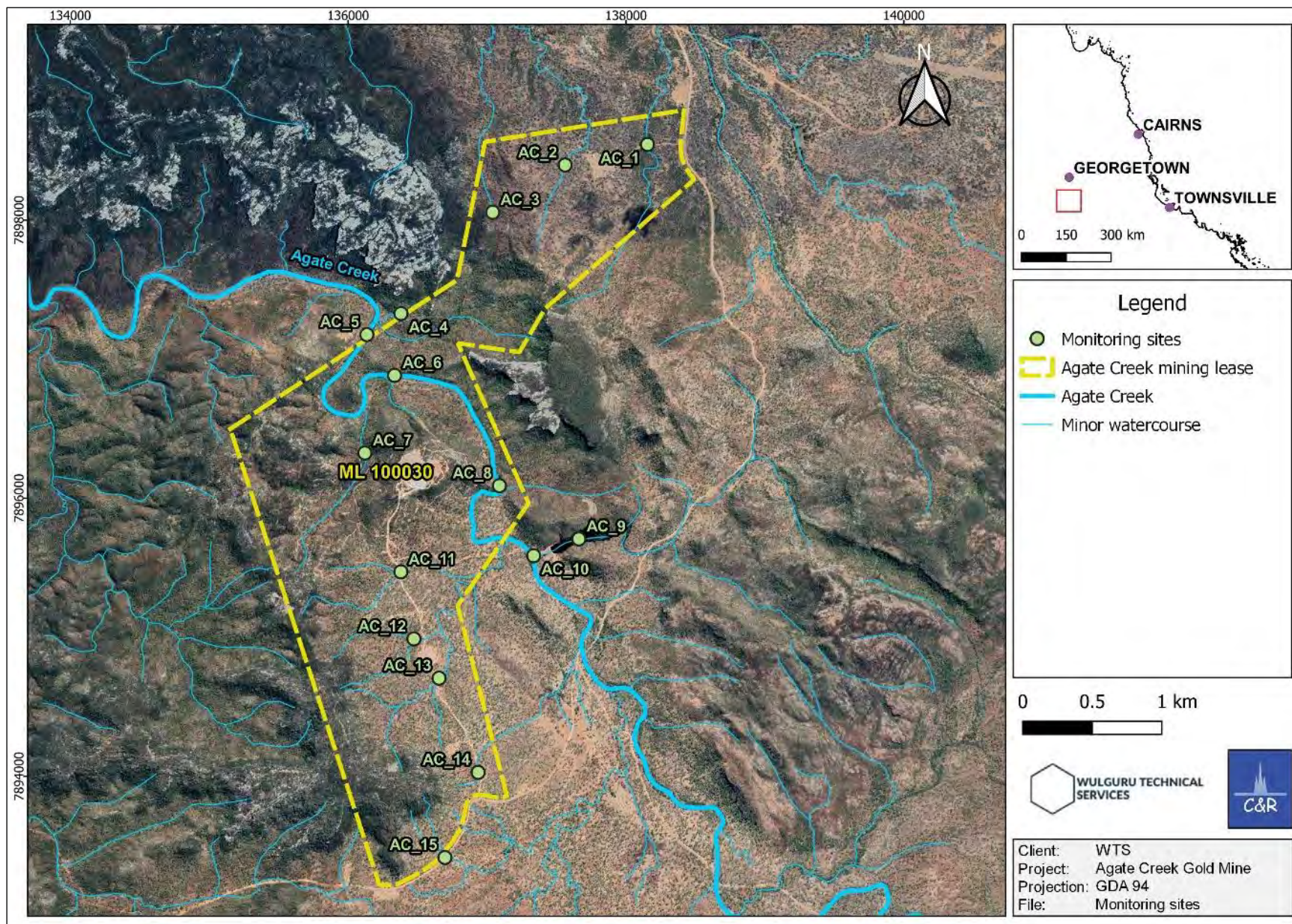


Figure 7: Sample site locations.

**Table 1: Fishing effort employed at each site during the dry season survey.**

| Site  | Habitat sampled                                       | Average depth (m) | Method                 | Fishing settings |           | Total effort |
|-------|-------------------------------------------------------|-------------------|------------------------|------------------|-----------|--------------|
| AC_9  | Deep, permanent pool (dam) with steep, incised banks  | >1.5              | Cathedral trap         | 2 deployed       | ¾" mesh   | 28 hrs       |
|       |                                                       |                   | Baited box traps       | 2 deployed       | 2 mm mesh | 28 hrs       |
|       |                                                       |                   | Baited opera traps     | 3 deployed       | 1" mesh   | 42 hrs       |
| AC_10 | Shallow small pool with bare margins and woody debris | ~0.5              | Baited box traps       | 2 deployed       | 2 mm mesh | 28 hrs       |
|       |                                                       |                   | Baited opera traps     | 3 deployed       | 1" mesh   | 42 hrs       |
|       |                                                       |                   | Backpack electrofisher | 360 V            | 60 Hz     | 25% duty     |
|       |                                                       |                   |                        |                  |           | 244 s        |

#### 4.2.5 TURTLE COMMUNITIES

Freshwater turtle surveys were conducted to identify any turtle species that may be present within the project site. Turtle communities at each targeted site were assessed via visual surveys. Baited cathedral traps were also employed at AC\_9, where suitable habitat was available (refer to Table 1 for further details on cathedral trap effort). Walk-through visual surveys (while electrofishing) – combined with cathedral traps – were determined to be the most effective methods to target all species of freshwater turtles potentially inhabiting the area.

#### 4.2.6 OTHER AQUATIC VERTEBRATES

The potential presence of other aquatic vertebrates in the region was assessed through the completion of a literature review and database searches, specifically the Commonwealth's *Protected Matters Search Tool* (2022). The database searches indicated that freshwater crocodiles (*Crocodylus johnsoni*) – listed as marine listed under the EPBC Act – have the potential to inhabit the greater area (i.e. within a 20 km radius of the project site). No other aquatic vertebrates with statutory protection were revealed from database searches.

A literature review, together with a habitat assessment, was undertaken to determine the potential for freshwater crocodiles to be present.

## 5. RESULTS AND DISCUSSION

### 5.1 DESCRIPTION OF HABITATS PRESENT

Field surveys were conducted in late-November 2021, at the end of the dry season. The vast majority of the 15 representative survey sites were dry at the time of sampling. Water was only present within the dam at AC\_9 and a small permanent pool that is maintained by a seep through the bottom of the AC\_9 dam wall (at AC\_10) adjacent to Agate Creek. Sites located in the main channel of Agate Creek presented the most diverse habitat characteristics (bank height, width, presence of woody debris) in contrast to sites located on minor tributaries. A few of the latter sites were barely more than shallow, contoured depressions through the landscape (e.g. AC\_2 and AC\_14) and thus likely provide little opportunity for substantial aquatic habitat even through the wet season. Table 2 describes each sampling site in additional detail, along with site photographs.

#### 5.1.1 AGATE CREEK

Agate Creek is a moderate-sized, intermittent watercourse that experiences flows for an extended period following the wet season but almost entirely dries out during the dry season (Table 2). The sand-dominated substrate combined with wet season (event-based) flows can result in the downstream reaches of Agate Creek experiencing high rates of sediment transportation and deposition.

The entire catchment area is impacted by historical and current farming and – to a lesser extent – mining activities. Cattle grazing occurs throughout the Agate Creek catchment area. No other mines are known to operate within the Agate Creek catchment area, except for recreational fossicking. Recent cattle activity was noted at AC\_10, with cattle grazing near the site during sampling. The water within that site was extremely turbid, most likely a result of cattle drinking. Agate Creek and some associated tributaries have also been slightly modified at localised points in the past for multiple road/track crossings.

Within the project site, the riparian vegetation along Agate Creek generally achieves widths of less than 10 m, sometimes extending out up to 20 m. The riparian biomass is dominated by large trees comprised mostly of a mix of *Lophostemon grandiflorus*, *Melaleuca fluviatilis*, *Eucalyptus camaldulensis* and *Petalostigma pubescens*. However, the understorey is dominated by introduced buffel grass.

Although no flows were observed during the dry season, there were several naturally occurring riffle zones within Agate Creek, associated with exposed bedrock, large boulders and cobble (Table 2). However, the substrate throughout the greater Agate Creek catchment is dominated by coarse sand. There are no naturally occurring permanent pools on any of the watercourses within the project site.

**Table 2: Site descriptions, pictures and sampling limitations.**

| Site                        | Upstream view                                                                       | Downstream view                                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cave Creek catchment</b> |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>AC_1</b>                 |    |    | <p>Located north of mining activities, near the north-eastern boundary of the mining lease. A minor channel flowing into Cave Creek, AC_1 is characterised by a sandy, rocky substrate with moderate amounts of leaf litter and woody vegetation present. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                |
| <b>AC_2</b>                 |   |   | <p>Located near the northern boundary of the mining lease. This small tributary to Cave Creek is characterised by a relatively low profile, with moderate amounts of leaf litter and woody vegetation present. The bed is largely comprised of soil. There are also numerous termite mounds in the area. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p> |
| <b>AC_3</b>                 |  |  | <p>AC_3 is located near the north-western boundary of the mining lease. The site is situated in a minor drainage line flowing north into Cave Creek. AC_3 is characterised by a sandy, rocky substrate with a high amount of grass cover and moderate amounts of woody vegetation. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                       |

| Site                         | Upstream view                                                                       | Downstream view                                                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Agate Creek catchment</b> |                                                                                     |                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>AC_4</b>                  |    |    | <p>Located on the north-western boundary of the mining lease, on a minor tributary of Agate Creek north of the main mine disturbance area. AC_4 is characterised by a narrow channel with a rocky/cobble substrate – bounded on either side by open woodland at the base of a hill to the north. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                                                     |
| <b>AC_5</b>                  |    |    | <p>Located on Agate Creek at the north-western boundary of the central section of the mining lease. AC_5 is characterised by a shallow channel (~10 m wide). It is composed of long alternating stretches of sand, interspersed with exposed cobble, boulder and bedrock.</p> <p>The riparian community was dominated by <i>Lophostemon grandiflorus</i>, with a sub-dominant presence of <i>Melaleuca fluviatilis</i>.</p> <p>The site was dry at the time of sampling.</p> |
| <b>AC_6</b>                  |  |  | <p>Located on Agate Creek approximately 300 m south of AC_4 and north of the main mine pit. This site is characterised by an incised channel between low hills, approximately 10 m wide. The bed substrate was dominated (~80%) by sand, with cobble, boulders and exposed bedrock observed throughout the remainder of the channel.</p> <p>The riparian community was dominated by a mixture of <i>Lophostemon grandiflorus</i> and <i>Melaleuca fluviatilis</i>.</p>       |

| Site | Upstream view                                                                      | Downstream view                                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                                    |                                                                                     | The site was dry at the time of sampling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| AC_7 | NA                                                                                 | NA                                                                                  | <p>Site pictures not available.</p> <p>Located on a minor tributary of Agate Creek north of the main mine disturbance area. AC_7 is characterised by a narrow channel with a rocky/cobble substrate – bounded on either side by open woodland between the base of two hills to the north and east. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                                                                                                                                         |
| AC_8 |  |  | <p>Located on Agate Creek about 400 m east of the main extraction area. The site is characterised by an incised channel approximately 20 m wide, with a substrate largely composed of a deep, undulating sand bed and large boulders from a forested rock escarpment along the eastern edge.</p> <p>The riparian community was dominated by a mixture of species, including <i>Lophostemon grandiflorus</i>, <i>Melaleuca fluviatilis</i>, <i>Eucalyptus camaldulensis</i> and <i>Petalostigma pubescens</i>.</p> <p>The site was dry at the time of sampling.</p> |

| Site  | Upstream view                                                                      | Downstream view                                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC_9  |  |                                                                                     | <p>AC_9 is located just outside the eastern boundary of the mining lease, adjacent to Agate Creek. The site is a historical impoundment originally installed by the landowner, with assistance later provided by Laneway Resources to 'sure-up' the wall. The in-channel farm dam has steep-sided banks. Its dimensions are about 600 m x 100 m and a depth exceeding 3 m – created by building an approximately 6-metre high, earthen bund wall across a minor watercourse running west into Agate Creek.</p> <p>Riparian vegetation and macrophytes are yet to establish within the waterbody. The observed substrate was dominated by soil and cobble/rocks, with large amounts of woody debris noted from inundated trees that have subsequently died.</p> |
| AC_10 |  |  | <p>AC_10 is located adjacent to Agate Creek, immediately downstream of the dam wall which forms the artificial impoundment at AC_9. The site consists of a small (~20 m x 10 m), shallow (~50 cm) pool at the base of the bund wall, bounded by an access road to the east. At the time this site was visited, water was slowly flowing over the access road before disappearing into the alluvium on the downstream western side.</p> <p>The substrate was comprised of soil and the waterbody had been recently, heavily utilised by cattle for drinking water. An algal bloom was observed at the site, with cattle faeces and decaying vegetation noted within the system.</p>                                                                             |

| Site  | Upstream view                                                                      | Downstream view                                                                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC_11 |   |   | <p>Located on a minor watercourse along the main road leading south from the main mining area, approximately 1 km due west from AC_10. The site consists of a narrow, incised channel (~1 m deep) through open, grassy woodland, with a substrate composed of a mixture of sand and silt. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                                                                                |
| AC_12 |   |   | <p>Located on a minor watercourse along the western side of the main road leading south from the main mining area, approximately 300 m south of AC_11 in the southern section of the mining lease. The site consists of a wide, shallow channel (generally &lt;50 cm deep) through open, grassy woodland, with a substrate largely composed of sand. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                     |
| AC_13 |  |  | <p>Located on a minor watercourse along the eastern side of the main road leading south from the main mining area, approximately 500 m south of AC_12 in the southern section of the mining lease. The site consists of a meandering, eroded channel (up to 1 m bank height) through open, grassy woodland. The substrate is largely composed of sand but with coarse gravel along the outside of bends. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p> |

| Site  | Upstream view                                                                     | Downstream view                                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC_14 |  |  | <p>Located on a minor watercourse in the south-eastern corner of the mining lease. The site consists of a small (&lt;2 m wide), shallow (&lt;0.5 m deep) channel through open, grassy woodland, with a substrate largely composed of soil. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p>                                                                            |
| AC_15 |  |  | <p>Located on a minor watercourse along the southern boundary of the mining lease. The site consists of a narrow (&lt;3 m wide), shallow (&lt;1 m deep) channel, eroded in places, running through open, grassy woodland. Substrate is largely composed of sand, with rocky, eroded sections interspersed throughout. There is no defined riparian zone.</p> <p>The site was dry at the time of sampling.</p> |

## 5.2 FISH COMMUNITY

Four (4) species of freshwater fish were identified from two sites (AC\_9 and AC\_10) during the 2021 field survey (Table 3). All collected species were potamodromous in relation to movement ecology and habitat affiliation (Pusey *et al.*, 2004; Table 4). The most abundant species were chequered rainbowfish (*Melanotaenia splendida inornata*), followed by spangled perch (*Leiopotherapon unicolor*), Hyrtl's catfish (*Neosilurus hyrtlii*) and reticulated glassfish (*Ambassis macleayi*) (Table 3). No fish species listed under the EPBC Act or the NC Act were found during the field surveys. Photos of each fish species are provided in Appendix B.

**Table 3: Fish community composition and abundance at each surveyed site.**

| Species                                | Common Name           | Site     |          |
|----------------------------------------|-----------------------|----------|----------|
|                                        |                       | AC_9     | AC_10    |
| <i>Ambassis macleayi</i>               | Reticulated glassfish | 1        | –        |
| <i>Leiopotherapon unicolor</i>         | Spangled perch        | 3        | 10       |
| <i>Melanotaenia splendida inornata</i> | Chequered rainbowfish | 26       | 50       |
| <i>Neosilurus hyrtlii</i>              | Hyrtl's catfish       | 3        | 1        |
| <b>Total diversity</b>                 |                       | <b>4</b> | <b>1</b> |

No publicly available studies have investigated aquatic vertebrate communities within the Agate Creek catchment area. Further, studies examining the fish communities within the overarching Gilbert River catchment are limited (Vallance *et al.*, 2000; Ecowise, 2007; Burrows, 2008; Waltham *et al.*, 2013) and, as such, the distribution of fish species throughout the Gilbert River catchment is poorly known. Most of the existing surveys focused on the lower to middle reaches of the main river(s), leaving the vast majority of the associated tributaries and upper reaches of the Gilbert River largely unstudied. Indeed, both the ALA and EPBC *Protected Matters Search Tool* returned no records for fish or aquatic fauna (protected or otherwise) within a 20 km radius of the project site. Due to the paucity of records directly applicable to the project site on Agate Creek, the results of all available fish surveys undertaken within the Gilbert River catchment area (including the Einsleigh, Lynd and Copperfield rivers) are summarised in Table 4 to provide an overall regional context to the known fish communities. It is important to note that this list includes sites located in the lower catchment. The lower catchment contains additional species whose occurrence within the project site is unlikely because of the associated habitat types present – and the position of the study area within the overall upstream Gilbert River catchment. This also applies to the upstream area of the study site (i.e. upper Agate Creek catchment area).

To date, the closest publicly available fish survey to the project site was undertaken on the Gilbert River between North-head and Prestwood stations, approximately 35 km north-west of ACGM (Vallance *et al.*, 2000). The results of that study provide an applicable context of which fish species potentially occur in Agate Creek during the wet season because the ACGM study sites are about 30 km upstream of the Robertson/Gilbert river confluence (see Section 2.1). In total, Vallance *et al.* (2000) recorded 15 species of freshwater fish, two of which (*Sciades leptaspis* and *Toxotes chatareus*) are noted as amphidromous species, highlighting the importance of maintaining connectivity to downstream systems for fish passage. Many of the fish species identified by Vallance *et al.* (2000) display a propensity to disperse widely into newly available habitats when increased connectivity is provided by amplified flows during the wet season (Warfe *et al.*, 2011). Table 5 details the ecology of the fish species regarded as likely to inhabit Agate Creek during the wet season (refer to Table 4) based on the outcomes of the literature review, field survey results and the known habitat requirements of each species.

**Table 4:** Fish species in the Gilbert River catchment, this study and estimated likelihood of occurrence. Sourced literature include: 1) Vallance *et al.* (2000), 2) Burrows, (2008), 3) Waltham *et al.* (2013), and 3\*) Ecowise (2007) adapted from Waltham *et al.* (2013).

| Family               | Species                               | Common name           | River                | Reference(s) | This study | Likelihood of occurrence |
|----------------------|---------------------------------------|-----------------------|----------------------|--------------|------------|--------------------------|
| <b>Anadromous</b>    |                                       |                       |                      |              |            |                          |
| <i>Pristidae</i>     | <i>Pristis pristis</i>                | Freshwater sawfish    | Gilbert, Einsleigh   | 1, 2, 3      |            | Unlikely                 |
| <b>Catadromous</b>   |                                       |                       |                      |              |            |                          |
| <i>Latidae</i>       | <i>Lates calcarifer</i>               | Barramundi            | Gilbert              | 3            |            | Unlikely                 |
| <b>Amphidromous</b>  |                                       |                       |                      |              |            |                          |
| <i>Ariidae</i>       | <i>Neoarius berneyi</i>               | Berney's catfish      | Gilbert              | 3*           |            | Unlikely                 |
| <i>Ariidae</i>       | <i>Neoarius graeffei</i>              | Lesser salmon catfish | Einsleigh            | 1, 2, 3      |            | Unlikely                 |
| <i>Ariidae</i>       | <i>Neoarius paucus</i>                | Carpentaria catfish   | Gilbert              | 3*           |            | Unlikely                 |
| <i>Ariidae</i>       | <i>Sciades leptaspis</i>              | Boofhead catfish      | Gilbert, Einsleigh   | 1, 2         |            | Potentially              |
| <i>Dasyatidae</i>    | <i>Urogymnus dalyensis</i>            | Freshwater whipray    | Gilbert              | 2, 3         |            | Unlikely                 |
| <i>Engraulidae</i>   | <i>Thryssa scratchleyi</i>            | Freshwater anchovy    | Gilbert              | 3            |            | Unlikely                 |
| <i>Gobiidae</i>      | <i>Glossogobius aureus</i>            | Golden goby           | Gilbert              | 3            |            | Unlikely                 |
| <i>Gobiidae</i>      | <i>Glossogobius munroi</i><br>(sp. C) | Square splotched goby | Copperfield          | 1, 2         |            | Unlikely                 |
| <i>Hemiramphidae</i> | <i>Arramphus sclerolepis</i>          | Snub-nosed garfish    | Gilbert              | 3*           |            | Unlikely                 |
| <i>Megalopidae</i>   | <i>Megalops cyprinoides</i>           | Tarpon                | Gilbert              | 3            |            | Unlikely                 |
| <i>Scatophagidae</i> | <i>Scatphagus argus</i>               | Spotted scat          | Gilbert              | 3            |            | Unlikely                 |
| <i>Soleidae</i>      | <i>Brachirus salinarum</i>            | Saltpan sole          | Gilbert              | 3*           |            | Unlikely                 |
| <i>Soleidae</i>      | <i>Brachirus selheimi</i>             | Freshwater sole       | Gilbert              | 3            |            | Potentially              |
| <i>Toxotidae</i>     | <i>Toxotes chatareus</i>              | Seven spot archerfish | Gilbert, Copperfield | 1, 2, 3      |            | Potentially              |
| <b>Potamodromous</b> |                                       |                       |                      |              |            |                          |
| <i>Ambassidae</i>    | <i>Ambassis agrammus</i>              | Sailfin perchlet      | Gilbert              | 1, 2         |            | Likely                   |
| <i>Ambassidae</i>    | <i>Ambassis elongatus</i>             | Elongate glassfish    | Gilbert              | 3*           |            | Potentially              |
| <i>Ambassidae</i>    | <i>Ambassis macleayi</i>              | Reticulated glassfish | Gilbert, Einsleigh   | 1, 2, 3      | Y          | Confirmed                |

| Family          | Species                                | Common name                     | River                           | Reference(s) | This study | Likelihood of occurrence |
|-----------------|----------------------------------------|---------------------------------|---------------------------------|--------------|------------|--------------------------|
| Ambassidae      | <i>Parambassis gulliveri</i>           | Giant glassfish                 | Gilbert                         | 3*           |            | Unlikely                 |
| Apogonidae      | <i>Glossamia aprion</i>                | Mouth almighty                  | Einsleigh                       | 1,2,3        |            | Potentially              |
| Atherinidae     | <i>Craterocephalus stercusmuscarum</i> | Fly-specked hardyhead           | Einsleigh                       | 1,2,3        |            | Unlikely                 |
| Belonidae       | <i>Strongylura krefftii</i>            | Freshwater longtom              | Gilbert                         | 3            |            | Unlikely                 |
| Clupeidae       | <i>Nematolosa erebi</i>                | Bony bream                      | Gilbert, Copperfield, Einsleigh | 1, 2, 3      |            | Likely                   |
| Eleotridae      | <i>Hypseleotris sp.</i>                | Gilbert gudgeon                 | Gilbert                         | 3*           |            | Unlikely                 |
| Eleotridae      | <i>Oxyeleotris lineolatus</i>          | Sleepy cod                      | Gilbert, Copperfield, Einsleigh | 1, 2, 3      |            | Potentially              |
| Eleotridae      | <i>Oxyeleotris selheimi</i>            | Giant gudgeon                   | Gilbert, Copperfield, Einsleigh | 1, 2, 3      |            | Potentially              |
| Eleotridae      | <i>Mogurnda mogurnda</i>               | Northern purple-spotted gudgeon | Copperfield                     | 1, 2, 3      |            | Likely                   |
| Melanotaeniidae | <i>Melanotaenia splendida inornata</i> | Chequered rainbowfish           | Gilbert, Copperfield, Einsleigh | 1, 2, 3      | Y          | Confirmed                |
| Plotosidae      | <i>Anodontiglanis dahli</i>            | Toothless catfish               | Gilbert                         | 1, 2, 3      |            | Potentially              |
| Plotosidae      | <i>Neosilurus ater</i>                 | Black catfish                   | Einsleigh                       | 1, 2, 3      |            | Potentially              |
| Plotosidae      | <i>Neosilurus hyrtlii</i>              | Hyrtl's tandan                  | Gilbert, Einsleigh              | 1, 2, 3      | Y          | Confirmed                |
| Plotodidae      | <i>Porochilus rendahli</i>             | Rendahl's catfish               | Gilbert                         | 3*           |            | Likely                   |
| Terapontidae    | <i>Amniataba percoides</i>             | Banded grunter                  | Gilbert, Copperfield, Einsleigh | 1, 2, 3      |            | Likely                   |
| Terapontidae    | <i>Hephaestus fuliginosus</i>          | Sooty grunter                   | Gilbert, Copperfield, Einsleigh | 1, 2, 3      |            | Potentially              |
| Terapontidae    | <i>Leiopotherapon unicolor</i>         | Spangled perch                  | Gilbert, Copperfield, Einsleigh | 1, 2, 3      | Y          | Confirmed                |
| Terapontidae    | <i>Pingalla gilberti</i>               | Gilbert's grunter               | Gilbert                         | 1, 2         |            | Potentially              |
| Terapontidae    | <i>Scortum ogilbyi</i>                 | Gulf grunter                    | Gilbert, Einsleigh              | 1, 2, 3      |            | Potentially              |

**Table 5: Environmental tolerances and life history (Pusey *et al.*, 2004) of the fish species caught in the freshwater reaches during current surveys.**

| Species                         | Common name         | Environmental tolerances |            |            |           |                 | Life history / Ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|---------------------|--------------------------|------------|------------|-----------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 |                     | Temp (°C)                | EC (µS/cm) | pH         | DO (mg/L) | Turbidity (NTU) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Ambassis agrammus</i>        | Sailfin glassfish   | 17.5 – 38                | 4 – 220    | 3.8 – 7.5  | 2.5 – 11  | 0.33 – 360      | <p>This species reaches sexual maturity at &lt;12 months old and generally lives for &lt;2 years. They spawn in lowland, lentic habitats (at night) early in the wet season, with water temperature a likely trigger. They spawn in batches of 5-20 eggs each night over a 4-night period. Fertilised eggs will hatch in 21-22 hrs and the larvae will be able to actively feed after 4 days.</p> <p>Sailfin glassfish are known to undertake downstream migrations at the beginning of the wet season travelling from dry season refugia to the lowland lentic spawning grounds.</p> <p>Glassfish generally feed on macroinvertebrates – mainly aquatic insects and micro-crustaceans.</p>             |
| <i>Ambassis macleayi</i>        | Macleay's glassfish | 22.9 – 38                | 2 – 620    | 4.8 – 9.1  | 1.0 – 9.1 | 1.0 – 150       | <p>This species reaches sexual maturity at &lt;12 months old and lives for up to 3 years. They spawn in thick macrophyte beds during flows within the wet season, with water temperature a likely trigger. They spawn in batches of several hundred eggs each day over a 7-day period. Fertilised eggs will hatch in less than 24 hours and the larvae will be able to actively feed after 3 days.</p> <p>Macleay's glassfish are known to undertake upstream migrations at the end of the wet season, likely looking for dry-season refugia.</p> <p>Glassfish generally feed on macroinvertebrates – mainly aquatic insects and micro-crustaceans.</p>                                                 |
| <i>Amniataba percoides</i>      | Barred grunter      | 21 – 35                  | 2 – 780    | 4.5 – 8.46 | 0.2 – 11  | 0.28 – 360      | <p>This species reaches sexual maturity at &lt;12 months old. Timing of spawning is wide-ranging and dependent on the region but generally occurs sometime between the early dry season and mid-wet season. Spawning behaviour is not well known but it likely takes place over sandy and muddy substrates, with individual females able to produce many thousands of eggs at a time.</p> <p>Barred grunter are known to undertake downstream migrations at the beginning of the wet season (potentially for spawning) before migrating back upstream as lowland waterbodies contract with the onset of the dry season.</p> <p>The omnivorous species generally feeds on aquatic insects and algae.</p> |
| <i>Leiopotherapon unicolour</i> | Spangled perch      | 7.3 – 37.5               | 0 – 56,000 | 4 – 8.6    | 0.4 – ?   | 1.52 – 260      | <p>Spangled perch reach sexual maturity at 3 – 6 months. They spawn during the wet season months with the rising waters. Spawning occurs in shallow</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Species                                   | Common name            | Environmental tolerances |            |           |            |                 | Life history / Ecology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|------------------------|--------------------------|------------|-----------|------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                        | Temp (°C)                | EC (µS/cm) | pH        | DO (mg/L)  | Turbidity (NTU) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                           |                        |                          |            |           |            |                 | <p>pools/backwaters on the bed habitat. Fertilised eggs will hatch after 45 to 55 hours.</p> <p>Spangled perch are capable of large, quick migrations, travelling up to 9.5 km/day. The direction of travel (upstream or downstream) is highly dependent on the watercourse features and habitats available.</p> <p>Their diet mostly consists of aquatic insects, macro-crustaceans and other fish.</p>                                                                                                                                                                                                                                                                                                                             |
| <i>Melanotaenia splendida inornata</i> ** | Chequered rainbowfish  | 15 – 32.5                | 6 – 790    | 6 – 8.47  | 1.1 – 11.6 | 0.1 – 16        | <p>Rainbowfish reach sexual maturity in less than one year and generally spawn within the summer months. They deposit their adhesive eggs onto macrophyte beds or root masses. Fertilised eggs will hatch after approximately 7 to 12 days.</p> <p>Rainbowfish will commence an upstream migration with the onset of the wet season.</p> <p>Their diet is dominated by aquatic insects, algae and terrestrial invertebrates.</p>                                                                                                                                                                                                                                                                                                     |
| <i>Morgunda morgunda</i> ***              | Northern trout gudgeon | 11.9 – 31.7              | 72 – 2,495 | 5.6 – 8.8 | 0.6 – 12.8 | 0.2 – 200       | <p>Purple-spotted gudgeon reach sexual maturity at approximately 6 months old. Their spawning period in northern Queensland occurs at the beginning of the wet season (September – November), whereby an individual can spawn up to 7 times during this period, laying up to approximately 1,500 eggs on each occasion. The eggs are deposited on hard substrates such as rocks, woody debris and macrophytes. The male then guards them until they hatch, which can take up to two weeks.</p> <p>The species has a very broad diet – mainly targeting aquatic and terrestrial insects, but also preying on crustaceans, molluscs and other fish. They are not known to migrate. However, further studies need to be undertaken.</p> |
| <i>Neosilurus hyrtlii</i>                 | Hyrtl's tandan         | 12.8 – 36                | 4 – 1855   | 5.2 – 9.1 | 1 – 11.4   | 0.25 – 170      | <p>Hyrtl's tandan reach sexual maturity at approximately one year old. They spawn throughout the wet season, generally in bed habitat. Fertilised eggs will hatch after approximately 60 hours.</p> <p>This species is rarely observed migrating on mass. However, they are known to travel upstream with the onset of the wet season.</p> <p>Their diet consists mostly of aquatic insects, micro-crustaceans, detritus and molluscs.</p>                                                                                                                                                                                                                                                                                           |
| <i>Nematolosa erebi</i>                   | Bony bream             | 15 – 38                  | 2 – 780    | 5.1 – 9.1 | 1.1 – 12   | 0.3 – 360       | <p>Bony bream reach sexual maturity between 1 to 2 years old. Spawning occurs during the wet season months – on bed habitat within slow-flowing pools. The length of the hatching time is unknown but is suggested to be rapid.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Species                    | Common name       | Environmental tolerances |            |           |           |                 | Life history / Ecology                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------|-------------------|--------------------------|------------|-----------|-----------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |                   | Temp (°C)                | EC (µS/cm) | pH        | DO (mg/L) | Turbidity (NTU) |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                            |                   |                          |            |           |           |                 | Small fish move upstream during the year, especially at the beginning of the wet season.<br>Their diet is dominated by detritus but they will also consume algae, micro-crustaceans and aquatic insects to a large degree.                                                                                                                                                                                                                                        |
| <i>Porochilua rendahli</i> | Rendahl's catfish | 15 – 34                  | 2 – 620    | 5.2 – 8.3 | 2 – 11    | 1.3 – 5.4       | Very little is known about the life history of this species. However, spawning generally occurs in the early wet season, brought on by the increase in temperatures. One fish can produce up to 900 eggs, with adults reaching sexual maturity at >100 mm. Migration into muddy lowland lagoons for spawning has been documented within the Alligator River in the Northern Territory.<br>The species diet is dominated by aquatic insects and micro-crustaceans. |

\*\* Insufficient information/data is/are available for the chequered rainbowfish in relation to environmental tolerances and life history traits. Therefore, the provided data (and life history description) for the chequered rainbowfish is actually that of the eastern rainbowfish (*Melanotaenia splendida splendida*). However, these species are very similar and the provided information likely offers relevant insight into the life history traits and environmental tolerances of the chequered rainbowfish.

\*\*\* Insufficient information/data is/are available for the northern trout gudgeon in relation to environmental tolerances and life history traits. Therefore, the provided data (and life history description) for the northern trout gudgeon are actually that of the southern purple-spot gudgeon (*Morgunda adspersa*). However, these species are very similar and the provided information likely offers relevant insight into the life history traits and environmental tolerances of the northern trout gudgeon.

The presence of fish at the only two surveyed sites with water (AC\_9 and AC\_10) is not surprising given the intermittent nature of Agate Creek and the paucity of dry-season refugia within the upper catchment area. This has allowed the dam at AC\_9 and its associated seep (AC\_10) to become beneficial perennial waterholes to aquatic fauna and flora within the Agate Creek catchment. Perennial waterholes within the Gilbert River catchment are known to act as important refugia for aquatic fauna during the dry season periods when there is little to no flow (Waltham *et al.*, 2013).

### 5.3 FRESHWATER TURTLE COMMUNITY

No freshwater turtles were observed during the current survey of waterways within the project site. The distribution and extent of freshwater turtles within the Gilbert River catchment area remains poorly known. The records in the Australian National University examination museum and tissue collection – and relevant literature (ALA; UCWTCD) – showing only 73 records from three species in the greater Gilbert River catchment (*Chelodina oblonga*, *Chelodina canni* and *Myuchelys [Wollumbinia] latisternum*; ALA; UCWTCD; Georges and Thomson, 2010; Waltham *et al.*, 2013; Cann and Sadlier, 2017).

To date, most collections and sightings of freshwater turtles in the Gilbert River catchment area were within dams and off-channel lagoons associated with the lower to middle reaches of the Gilbert River, with additional, limited sampling in the associated Robertson River (Cobbold Gorge area, ~30 km north-northwest of ACGM). Additional records from the greater Gilbert River catchment area were in the upper Einsleigh River and Elizabeth Creek to the north-east. The three identified species (*Chelodina oblonga*, *Chelodina canni* and *Myuchelys latisternum*) are classed as “least concern” under the NC Act and are not listed federally.

That no freshwater turtles were observed during the current surveys of the project site is reflective of:

- The ephemeral nature of the waterways present;
- The near absence of both lotic and lentic refugial waterholes, combined with the short period of time since the establishment of the one lentic environment sampled;
- The position of the project site in the upper reaches of the Gilbert River catchment area; and
- The seasonal timing of the current survey.

The sawshelled turtle (*Myuchelys latisternum*) is the most abundant species recorded in the greater Gilbert River catchment – but only in upstream areas of the Einsleigh River, Elizabeth Creek at Mt. Surprise and in tributaries of the Robertson River at Cobbold Gorge. This species is known to be uncommon in lentic environments, instead preferring perennial headwaters of rocky streams and rivers (Waltham *et al.*, 2013; Cann and Sadlier, 2017). In contrast, species such as *Chelodina oblonga* and *Chelodina canni* are ephemeral floodplain wetland specialists adapted to overland movement, prolonged desiccation and/or sustained aestivation during the dry season (Fordham *et al.*, 2007; Cann and Sadlier, 2017). Recorded from off-channel, lentic waterholes in the middle reaches of the Gilbert River, Cann’s long-necked turtle (*Chelodina canni*) is widespread in many river catchments throughout northern Australia. However, these turtles remain poorly known because they spend significant amounts of time on land, frequently travelling long distances to reach new wetlands as opposed to aestivating (Cann, 1998; Doupe *et al.*, 2009). The northern long-necked turtle (*Chelodina oblonga*) tends to either aestivate by digging in soft mud or by tucking itself into root masses along the banks as the wetlands dry (Cann and Sadlier, 2017; Fordham *et al.*, 2007; Georges *et al.*, 2006) or, if necessary, migrates overland – but only short distances to proximal water bodies (Doupe *et al.*, 2009). This species has only been recorded in the lower coastal reaches of the Gilbert River where suitable floodplain habitat occurs.

For these three species, the relative proximity to large perennial/semi-perennial waterbodies play an important role in their persistence and determination of their distribution in semi-arid, tropical northern Queensland. Based on this assessment, it is suggested that only the sawshelled turtle and Cann's long-necked turtle have the potential to inhabit the project site or the upper reaches of Agate Creek.

## **5.4 OTHER AQUATIC VERTEBRATES**

The only other aquatic vertebrate identified as occurring within the Agate Creek catchment area was the freshwater crocodile (*Crocodylus johnsoni*; Appendix A). However, this species prefers large, perennial, lentic environments within the mid to upper reaches of larger watercourses (Read *et al.*, 2004). These types of habitats do not naturally occur within the Agate Creek catchment area. Therefore, the freshwater crocodile is not predicted to utilise Agate Creek and does not inhabit the project site.

## 6. POTENTIAL IMPACTS

### 6.1 PROPOSED ACTIVITIES

Historical mining activities undertaken across the mining lease – involving the removal of 45,000 t of ore – have been limited to:

- One targeted pit;
- An associated waste rock dump;
- A small camp; and
- Some minor tracks and roads.

Proposed expansion activities (Figure 8) will involve production ramping up to about 220,000 tpa and include the establishment of:

- Six pits (with one to extend the current pit footprint);
- Four waste rock dumps; and
- Nine sediment basins.

All ore will be transported off-site to be processed at the Georgetown processing plant, thereby limiting the potential for producing concentrated contaminants on site. Further, the waste rock has been found to be relatively benign (refer to *Waste rock characterisation* report; C&R, 2022). With the majority of the operations occurring on the western side of Agate Creek, there will be minimal development around (or through) the creek itself, with no crossings proposed. Therefore, the main impacts to aquatic ecosystems associated from the proposed expansion will be connected to increased runoff of sediment-laden water from disturbed areas. However, the establishment of the proposed sediment ponds (as well as other standard best-practice soil erosion and sediment control measures typically adopted within the mining industry) will limit the potential for sediment-laden waters to enter the receiving environment. Hence, the potential impacts to the receiving environment and the associated environmental values from the proposed expansion activities are expected to be of minor risk.

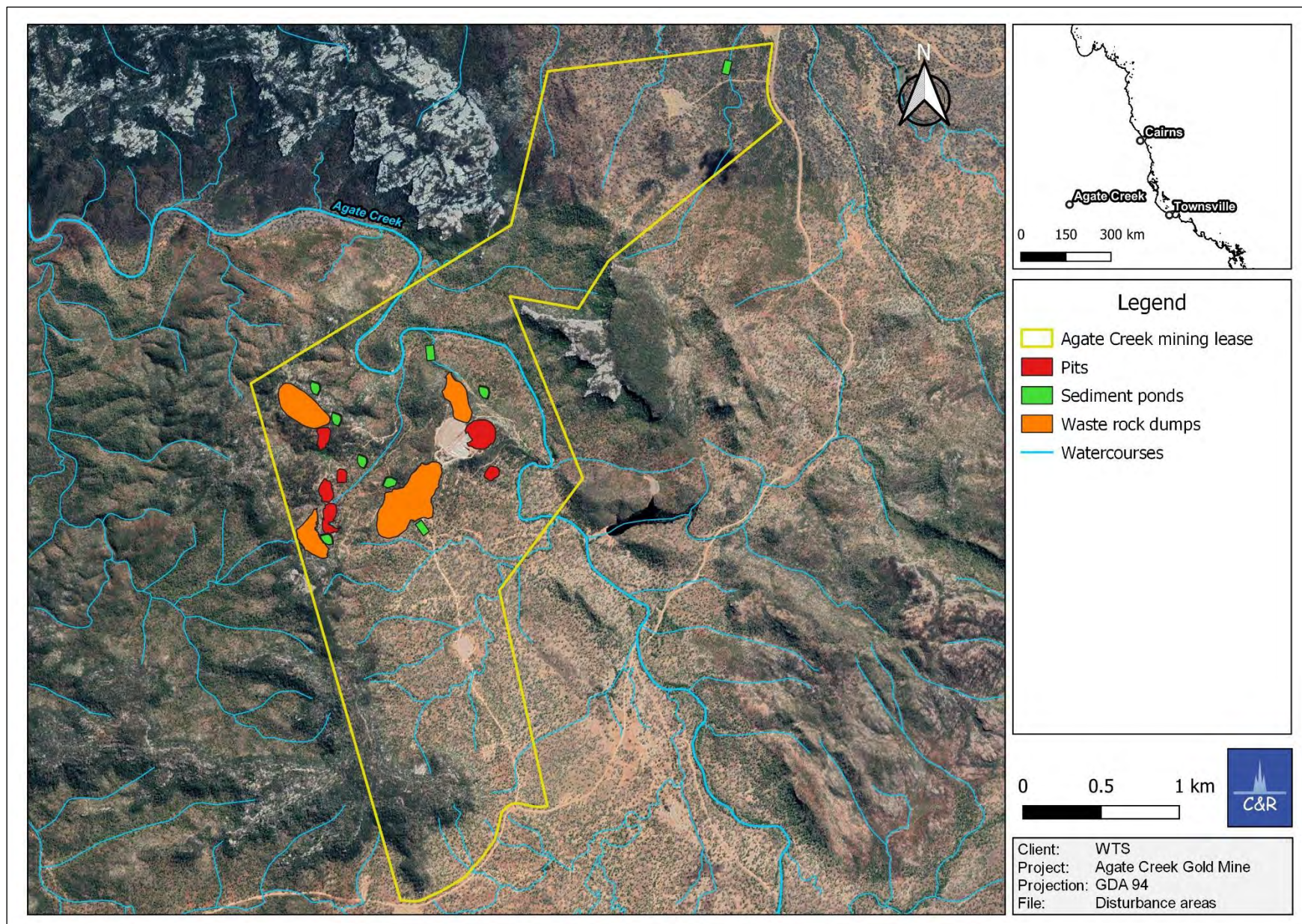


Figure 8: Proposed expansion disturbance footprint.

## 7. CONCLUSIONS

This report assessed the aquatic vertebrate fauna communities that have the potential to inhabit the ACGM mining lease – as well as the upstream Agate Creek catchment area, providing a baseline description of the communities present. The field survey was undertaken during the dry season, when most drainage lines across the project site were dry. This sub-optimal timing for sampling aquatic fauna was a result of restrictions with project timing requirements. Therefore, the field results were supplemented with a detailed literature review to characterise the likely aquatic vertebrate communities that utilise the project site.

The study identified four species of fish inhabiting the project site, with a further five expected to inhabit the upper catchment of Agate Creek. Two species of freshwater turtle also have the potential to utilise the Agate Creek catchment area, although none were found inhabiting the project site and suitable habitats were not present within the ACGM mining lease boundaries. No listed species were identified as inhabiting or within the potential to inhabit the Agate Creek catchment area.

The proposed expansion operations do not include any proposed activities within Agate Creek or its associated riparian zone, with a sediment dam only proposed along one of the minor drainage lines that leaves site, entering Agate Creek further downstream. Further, the main potential impacts from the proposed expansion activities are associated with increased sediment-laden water runoff from disturbed areas. However, any risks associated with this runoff can be easily reduced through the adoption of best-practice soil erosion and sediment control measures required for all mines within Queensland. Therefore, the proposed project is not expected to have any significant impacts on the aquatic ecology values identified within this assessment.

Note: All of the freshwater fish that could potentially inhabit the Agate Creek catchment area have migration patterns within their life history. Further, waterway barrier mapping identifies any development within Agate Creek as a major risk to fish passage. Therefore, any potential development within Agate Creek should take into consideration the requirements for the identified species of freshwater fish to maintain fish passage within the design of any future structures.

## 8. REFERENCES

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CLIENT: WULGURU TECHNICAL SERVICES  
PROJECT: AGATE CREEK GOLD MINE  
REPORT: AQUATIC VERTEBRATE ASSESSMENT  
DATE: JULY 2022



## **Appendix A – Search Results**



# 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.

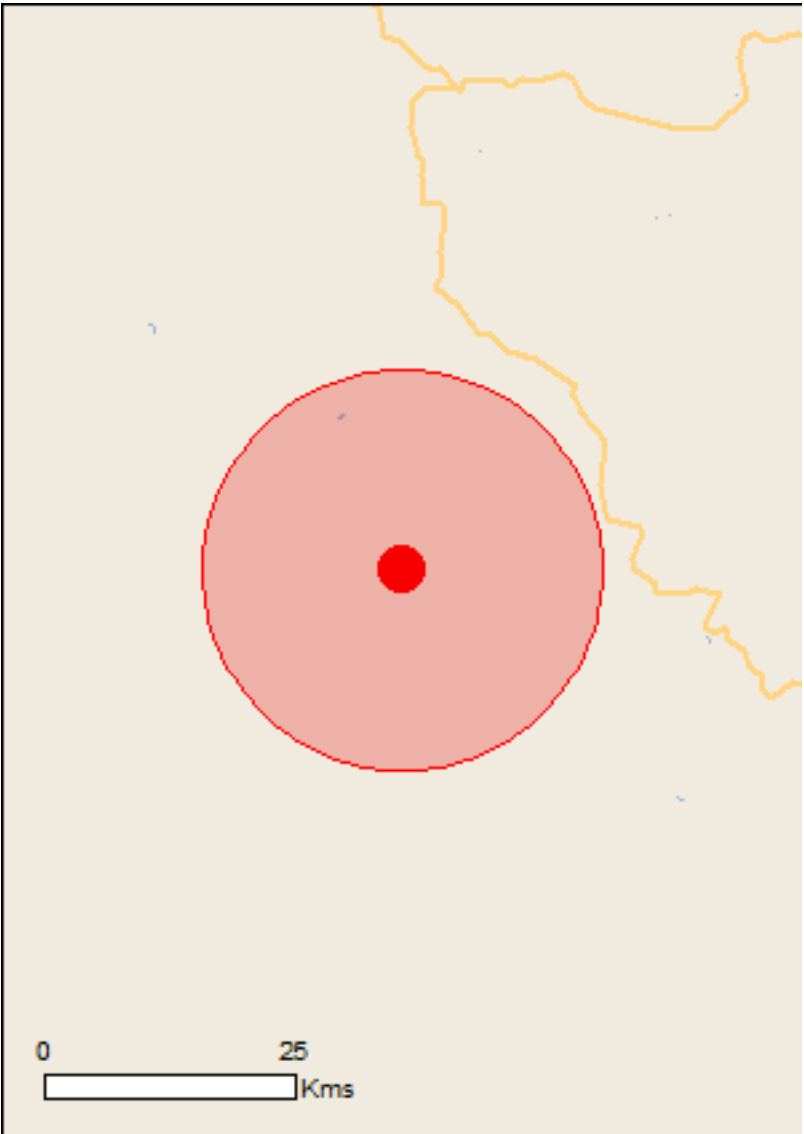
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 22/07/22 11:08:54

- [Summary](#)
- [Details](#)

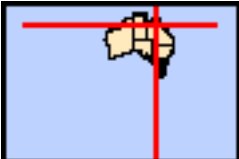
[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are  
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[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](#).

|                                                           |      |
|-----------------------------------------------------------|------|
| <a href="#">World Heritage Properties:</a>                | None |
| <a href="#">National Heritage Places:</a>                 | None |
| <a href="#">Wetlands of International Importance:</a>     | None |
| <a href="#">Great Barrier Reef Marine Park:</a>           | None |
| <a href="#">Commonwealth Marine Area:</a>                 | None |
| <a href="#">Listed Threatened Ecological Communities:</a> | None |
| <a href="#">Listed Threatened Species:</a>                | 14   |
| <a href="#">Listed Migratory Species:</a>                 | 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.

|                                                    |      |
|----------------------------------------------------|------|
| <a href="#">Commonwealth Land:</a>                 | None |
| <a href="#">Commonwealth Heritage Places:</a>      | None |
| <a href="#">Listed Marine Species:</a>             | 17   |
| <a href="#">Whales and Other Cetaceans:</a>        | None |
| <a href="#">Critical Habitats:</a>                 | None |
| <a href="#">Commonwealth Reserves Terrestrial:</a> | None |
| <a href="#">Australian Marine Parks:</a>           | None |

## Extra Information

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

|                                                  |      |
|--------------------------------------------------|------|
| <a href="#">State and Territory Reserves:</a>    | 5    |
| <a href="#">Regional Forest Agreements:</a>      | None |
| <a href="#">Invasive Species:</a>                | 14   |
| <a href="#">Nationally Important Wetlands:</a>   | None |
| <a href="#">Key Ecological Features (Marine)</a> | None |

# Details

## Matters of National Environmental Significance

| Listed Threatened Species                                                                                                                                                                         |                       | [ Resource Information ]                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------|
| Name                                                                                                                                                                                              | Status                | Type of Presence                                       |
| Birds                                                                                                                                                                                             |                       |                                                        |
| <a href="#">Calidris ferruginea</a><br>Curlew Sandpiper [856]                                                                                                                                     | Critically Endangered | Species or species habitat may occur within area       |
| <a href="#">Erythrotriorchis radiatus</a><br>Red Goshawk [942]                                                                                                                                    | Vulnerable            | Species or species habitat may occur within area       |
| <a href="#">Erythrura gouldiae</a><br>Gouldian Finch [413]                                                                                                                                        | Endangered            | Species or species habitat known to occur within area  |
| <a href="#">Falco hypoleucos</a><br>Grey Falcon [929]                                                                                                                                             | Vulnerable            | Species or species habitat likely to occur within area |
| <a href="#">Rostratula australis</a><br>Australian Painted Snipe [77037]                                                                                                                          | Endangered            | Species or species habitat may occur within area       |
| <a href="#">Tyto novaehollandiae kimberli</a><br>Masked Owl (northern) [26048]                                                                                                                    | Vulnerable            | Species or species habitat may occur within area       |
| Mammals                                                                                                                                                                                           |                       |                                                        |
| <a href="#">Dasyurus hallucatus</a><br>Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]                                                                     | Endangered            | Species or species habitat may occur within area       |
| <a href="#">Macroderma gigas</a><br>Ghost Bat [174]                                                                                                                                               | Vulnerable            | Species or species habitat likely to occur within area |
| <a href="#">Petauroides minor</a><br>Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]                                                                                 | Vulnerable            | Species or species habitat likely to occur within area |
| <a href="#">Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</a><br>Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Endangered            | Species or species habitat may occur within area       |
| <a href="#">Rhinolophus robertsi</a><br>Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]                                                                                      | Vulnerable            | Species or species habitat may occur within area       |
| <a href="#">Saccolaimus saccolaimus nudicluniatus</a><br>Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]                                                                        | Vulnerable            | Species or species habitat may occur within area       |
| Plants                                                                                                                                                                                            |                       |                                                        |

| Name                                                     | Status     | Type of Presence                                       |
|----------------------------------------------------------|------------|--------------------------------------------------------|
| <a href="#">Cycas platyphylla</a><br>a cycad [55796]     | Vulnerable | Species or species habitat may occur within area       |
| <a href="#">Dichanthium setosum</a><br>bluegrass [14159] | Vulnerable | Species or species habitat likely to 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                                    |            |                                                        |
| <a href="#">Apus pacificus</a><br>Fork-tailed Swift [678] |            | Species or species habitat likely to occur within area |

|                                                                                |  |                                                  |
|--------------------------------------------------------------------------------|--|--------------------------------------------------|
| Migratory Terrestrial Species                                                  |  |                                                  |
| <a href="#">Cuculus optatus</a><br>Oriental Cuckoo, Horsfield's Cuckoo [86651] |  | Species or species habitat may occur within area |
| <a href="#">Hirundo rustica</a><br>Barn Swallow [662]                          |  | Species or species habitat may occur within area |
| <a href="#">Motacilla cinerea</a><br>Grey Wagtail [642]                        |  | Species or species habitat may occur within area |
| <a href="#">Motacilla flava</a><br>Yellow Wagtail [644]                        |  | Species or species habitat may occur within area |

|                                                                              |                       |                                                        |
|------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------|
| Migratory Wetlands Species                                                   |                       |                                                        |
| <a href="#">Actitis hypoleucos</a><br>Common Sandpiper [59309]               |                       | Species or species habitat may occur within area       |
| <a href="#">Calidris acuminata</a><br>Sharp-tailed Sandpiper [874]           |                       | Species or species habitat may occur within area       |
| <a href="#">Calidris ferruginea</a><br>Curlew Sandpiper [856]                | Critically Endangered | Species or species habitat may occur within area       |
| <a href="#">Calidris melanotos</a><br>Pectoral Sandpiper [858]               |                       | Species or species habitat may occur within area       |
| <a href="#">Gallinago hardwickii</a><br>Latham's Snipe, Japanese Snipe [863] |                       | Species or species habitat may occur within area       |
| <a href="#">Pandion haliaetus</a><br>Osprey [952]                            |                       | Species or species habitat likely to 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                                                                                            |                       |                                                        |
| <a href="#">Actitis hypoleucos</a><br>Common Sandpiper [59309]                                   |                       | Species or species habitat may occur within area       |
| <a href="#">Anseranas semipalmata</a><br>Magpie Goose [978]                                      |                       | Species or species habitat may occur within area       |
| <a href="#">Apus pacificus</a><br>Fork-tailed Swift [678]                                        |                       | Species or species habitat likely to occur within area |
| <a href="#">Ardea ibis</a><br>Cattle Egret [59542]                                               |                       | Species or species habitat may occur within area       |
| <a href="#">Calidris acuminata</a><br>Sharp-tailed Sandpiper [874]                               |                       | Species or species habitat may occur within area       |
| <a href="#">Calidris ferruginea</a><br>Curlew Sandpiper [856]                                    | Critically Endangered | Species or species habitat may occur within area       |
| <a href="#">Calidris melanotos</a><br>Pectoral Sandpiper [858]                                   |                       | Species or species habitat may occur within area       |
| <a href="#">Chrysococcyx osculans</a><br>Black-eared Cuckoo [705]                                |                       | Species or species habitat may occur within area       |
| <a href="#">Gallinago hardwickii</a><br>Latham's Snipe, Japanese Snipe [863]                     |                       | Species or species habitat may occur within area       |
| <a href="#">Haliaeetus leucogaster</a><br>White-bellied Sea-Eagle [943]                          |                       | Species or species habitat may occur within area       |
| <a href="#">Hirundo rustica</a><br>Barn Swallow [662]                                            |                       | Species or species habitat may occur within area       |
| <a href="#">Merops ornatus</a><br>Rainbow Bee-eater [670]                                        |                       | Species or species habitat may occur within area       |
| <a href="#">Motacilla cinerea</a><br>Grey Wagtail [642]                                          |                       | Species or species habitat may occur within area       |
| <a href="#">Motacilla flava</a><br>Yellow Wagtail [644]                                          |                       | Species or species habitat may occur within area       |
| <a href="#">Pandion haliaetus</a><br>Osprey [952]                                                |                       | Species or species habitat likely to occur within area |
| <a href="#">Rostratula benghalensis (sensu lato)</a><br>Painted Snipe [889]                      | Endangered*           | Species or species habitat may occur within            |

| Name                                                                     | Threatened | Type of Presence area                            |
|--------------------------------------------------------------------------|------------|--------------------------------------------------|
| Reptiles                                                                 |            |                                                  |
| <a href="#">Crocodylus johnstoni</a>                                     |            | Species or species habitat may occur within area |
| Freshwater Crocodile, Johnston's Crocodile, Johnstone's Crocodile [1773] |            |                                                  |

Extra Information

|                              |                          |
|------------------------------|--------------------------|
| State and Territory Reserves | [ Resource Information ] |
| Name                         | State                    |
| Cobbold Gorge                | QLD                      |
| Granite Creek                | QLD                      |
| Rungulla                     | QLD                      |
| Rungulla                     | QLD                      |
| Stuarts Spring               | QLD                      |

|                                                                                                                                                                                                                                                                                                                                                                                                                   |                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 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 within area |
| Passer domesticus                             |        |                                                        |
| House Sparrow [405]                           |        | Species or species habitat likely to occur within area |
| Streptopelia chinensis                        |        |                                                        |
| Spotted Turtle-Dove, Spotted Dove [780]       |        | Species or species habitat likely to occur within area |

|                   |  |                                                       |
|-------------------|--|-------------------------------------------------------|
| Frogs             |  |                                                       |
| Rhinella marina   |  | Species or species habitat known to occur within area |
| Cane Toad [83218] |  |                                                       |

|                                   |  |                                                        |
|-----------------------------------|--|--------------------------------------------------------|
| 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 |
| Equus caballus                    |  |                                                        |
| Horse [5]                         |  | 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 |

| Name                                                                                                                                 | Status | Type of Presence                                       |
|--------------------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------|
| Oryctolagus cuniculus<br>Rabbit, European Rabbit [128]                                                                               |        | Species or species habitat likely to occur within area |
| Sus scrofa<br>Pig [6]                                                                                                                |        | Species or species habitat likely to occur within area |
| Plants                                                                                                                               |        |                                                        |
| Acacia nilotica subsp. indica<br>Prickly Acacia [6196]                                                                               |        | Species or species habitat may occur within area       |
| Cryptostegia grandiflora<br>Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913] |        | Species or species habitat likely to occur within area |
| Parkinsonia aculeata<br>Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]                                            |        | Species or species habitat likely to occur within area |
| Vachellia nilotica<br>Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]                                       |        | 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

-18.99579 143.54935

# 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

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

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# Queensland Government

## WildNet species list

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Queensland status: All

Records: All

Date: All

Latitude: -18.9961

Longitude: 143.5492

Distance: 20

Email: matt@candrconsulting.com.au

Date submitted: Friday 22 Jul 2022 11:10:40

Date extracted: Friday 22 Jul 2022 11:20:02

The number of records retrieved = 556

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The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (<https://www.qld.gov.au/environment/plants-animals/species-information/wildnet>) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to [wildlife.online@des.qld.gov.au](mailto:wildlife.online@des.qld.gov.au).

| Kingdom | Class      | Family        | Scientific Name                   | Common Name                 | I | Q | A | Records |
|---------|------------|---------------|-----------------------------------|-----------------------------|---|---|---|---------|
| animals | amphibians | Bufonidae     | <i>Rhinella marina</i>            | cane toad                   | Y |   |   | 1       |
| animals | amphibians | Hylidae       | <i>Litoria caerulea</i>           | common green treefrog       |   | C |   | 1       |
| animals | amphibians | Hylidae       | <i>Litoria inermis</i>            | bumpy rocketfrog            |   | C |   | 5       |
| animals | amphibians | Hylidae       | <i>Litoria rubella</i>            | ruddy treefrog              |   | C |   | 2       |
| animals | birds      | Acanthizidae  | <i>Gerygone olivacea</i>          | white-throated gerygone     |   | C |   | 2       |
| animals | birds      | Acanthizidae  | <i>Smicrornis brevirostris</i>    | weebill                     |   | C |   | 6       |
| animals | birds      | Accipitridae  | <i>Accipiter cirrocephalus</i>    | collared sparrowhawk        |   | C |   | 1       |
| animals | birds      | Accipitridae  | <i>Aquila audax</i>               | wedge-tailed eagle          |   | C |   | 4       |
| animals | birds      | Accipitridae  | <i>Circus assimilis</i>           | spotted harrier             |   | C |   | 2       |
| animals | birds      | Accipitridae  | <i>Haliastur sphenurus</i>        | whistling kite              |   | C |   | 3       |
| animals | birds      | Accipitridae  | <i>Hamirostra melanosternon</i>   | black-breasted buzzard      |   | C |   | 1       |
| animals | birds      | Accipitridae  | <i>Milvus migrans</i>             | black kite                  |   | C |   | 2       |
| animals | birds      | Alcedinidae   | <i>Ceyx azureus</i>               | azure kingfisher            |   | C |   | 1       |
| animals | birds      | Anatidae      | <i>Anas gracilis</i>              | grey teal                   |   | C |   | 1       |
| animals | birds      | Anatidae      | <i>Chenonetta jubata</i>          | Australian wood duck        |   | C |   | 1       |
| animals | birds      | Anhingidae    | <i>Anhinga novaehollandiae</i>    | Australasian darter         |   | C |   | 1       |
| animals | birds      | Ardeidae      | <i>Ardea alba modesta</i>         | eastern great egret         |   | C |   | 1       |
| animals | birds      | Ardeidae      | <i>Ardea pacifica</i>             | white-necked heron          |   | C |   | 1       |
| animals | birds      | Ardeidae      | <i>Egretta novaehollandiae</i>    | white-faced heron           |   | C |   | 3       |
| animals | birds      | Ardeidae      | <i>Nycticorax caledonicus</i>     | nankeen night-heron         |   | C |   | 1       |
| animals | birds      | Artamidae     | <i>Artamus cinereus</i>           | black-faced woodswallow     |   | C |   | 2       |
| animals | birds      | Artamidae     | <i>Artamus cyanopterus</i>        | dusky woodswallow           |   | C |   | 1       |
| animals | birds      | Artamidae     | <i>Artamus minor</i>              | little woodswallow          |   | C |   | 1       |
| animals | birds      | Artamidae     | <i>Artamus personatus</i>         | masked woodswallow          |   | C |   | 1       |
| animals | birds      | Artamidae     | <i>Artamus superciliosus</i>      | white-browed woodswallow    |   | C |   | 1       |
| animals | birds      | Artamidae     | <i>Cracticus nigrogularis</i>     | pied butcherbird            |   | C |   | 8       |
| animals | birds      | Artamidae     | <i>Cracticus torquatus</i>        | grey butcherbird            |   | C |   | 5       |
| animals | birds      | Artamidae     | <i>Gymnorhina tibicen</i>         | Australian magpie           |   | C |   | 7       |
| animals | birds      | Artamidae     | <i>Strepera graculina</i>         | pied currawong              |   | C |   | 6       |
| animals | birds      | Cacatuidae    | <i>Cacatua galerita</i>           | sulphur-crested cockatoo    |   | C |   | 1       |
| animals | birds      | Cacatuidae    | <i>Calyptorhynchus banksii</i>    | red-tailed black-cockatoo   |   | C |   | 4       |
| animals | birds      | Cacatuidae    | <i>Eolophus roseicapilla</i>      | galah                       |   | C |   | 1       |
| animals | birds      | Campephagidae | <i>Coracina novaehollandiae</i>   | black-faced cuckoo-shrike   |   | C |   | 4       |
| animals | birds      | Campephagidae | <i>Coracina papuensis</i>         | white-bellied cuckoo-shrike |   | C |   | 2       |
| animals | birds      | Campephagidae | <i>Edolisoma tenuirostre</i>      | common cicadabird           |   | C |   | 1       |
| animals | birds      | Campephagidae | <i>Lalage tricolor</i>            | white-winged triller        |   | C |   | 2       |
| animals | birds      | Charadriidae  | <i>Elseyornis melanops</i>        | black-fronted dotterel      |   | C |   | 2       |
| animals | birds      | Ciconiidae    | <i>Ephippiorhynchus asiaticus</i> | black-necked stork          |   | C |   | 2       |
| animals | birds      | Climacteridae | <i>Climacteris picumnus</i>       | brown treecreeper           |   | C |   | 3       |
| animals | birds      | Columbidae    | <i>Geopelia cuneata</i>           | diamond dove                |   | C |   | 2       |
| animals | birds      | Columbidae    | <i>Geopelia placida</i>           | peaceful dove               |   | C |   | 6       |
| animals | birds      | Columbidae    | <i>Geophaps plumifera</i>         | spinifex pigeon             |   | C |   | 1       |
| animals | birds      | Columbidae    | <i>Geophaps scripta</i>           | squatter pigeon             |   | C |   | 4       |
| animals | birds      | Columbidae    | <i>Ocyphaps lophotes</i>          | crested pigeon              |   | C |   | 3       |
| animals | birds      | Columbidae    | <i>Phaps chalcoptera</i>          | common bronzewing           |   | C |   | 2       |
| animals | birds      | Corcoracidae  | <i>Struthidea cinerea</i>         | apostlebird                 |   | C |   | 9       |

| Kingdom | Class | Family            | Scientific Name                      | Common Name                         | I | Q | A | Records |
|---------|-------|-------------------|--------------------------------------|-------------------------------------|---|---|---|---------|
| animals | birds | Corvidae          | <i>Corvus orru</i>                   | Torresian crow                      |   | C |   | 5       |
| animals | birds | Cuculidae         | <i>Cacomantis pallidus</i>           | pallid cuckoo                       |   | C |   | 1       |
| animals | birds | Cuculidae         | <i>Centropus phasianinus</i>         | pheasant coucal                     |   | C |   | 1       |
| animals | birds | Cuculidae         | <i>Cuculus sp.</i>                   |                                     |   | C |   | 1       |
| animals | birds | Estrildidae       | <i>Poephila cincta</i>               | black-throated finch                |   | C |   | 2       |
| animals | birds | Estrildidae       | <i>Taeniopygia bichenovii</i>        | double-barred finch                 |   | C |   | 3       |
| animals | birds | Falconidae        | <i>Falco cenchroides</i>             | nankeen kestrel                     |   | C |   | 3       |
| animals | birds | Falconidae        | <i>Falco longipennis</i>             | Australian hobby                    |   | C |   | 1       |
| animals | birds | Halcyonidae       | <i>Dacelo leachii</i>                | blue-winged kookaburra              |   | C |   | 4       |
| animals | birds | Halcyonidae       | <i>Dacelo novaeguineae</i>           | laughing kookaburra                 |   | C |   | 4       |
| animals | birds | Halcyonidae       | <i>Todiramphus pyrrhopygius</i>      | red-backed kingfisher               |   | C |   | 2       |
| animals | birds | Maluridae         | <i>Malurus melanocephalus</i>        | red-backed fairy-wren               |   | C |   | 3       |
| animals | birds | Megapodiidae      | <i>Alectura lathamii</i>             | Australian brush-turkey             |   | C |   | 1       |
| animals | birds | Meliphagidae      | <i>Cissomela pectoralis</i>          | banded honeyeater                   |   | C |   | 1       |
| animals | birds | Meliphagidae      | <i>Conopophila rufogularis</i>       | rufous-throated honeyeater          |   | C |   | 1       |
| animals | birds | Meliphagidae      | <i>Entomyzon cyanotis</i>            | blue-faced honeyeater               |   | C |   | 6       |
| animals | birds | Meliphagidae      | <i>Lichmera indistincta</i>          | brown honeyeater                    |   | C |   | 4       |
| animals | birds | Meliphagidae      | <i>Manorina flavigula</i>            | yellow-throated miner               |   | C |   | 2       |
| animals | birds | Meliphagidae      | <i>Manorina melanocephala</i>        | noisy miner                         |   | C |   | 3       |
| animals | birds | Meliphagidae      | <i>Melithreptus albogularis</i>      | white-throated honeyeater           |   | C |   | 3       |
| animals | birds | Meliphagidae      | <i>Philemon citreogularis</i>        | little friarbird                    |   | C |   | 3       |
| animals | birds | Meliphagidae      | <i>Philemon corniculatus</i>         | noisy friarbird                     |   | C |   | 2       |
| animals | birds | Meliphagidae      | <i>Ptilotula flavescens</i>          | yellow-tinted honeyeater            |   | C |   | 1       |
| animals | birds | Meliphagidae      | <i>Ptilotula plumula</i>             | grey-fronted honeyeater             |   | C |   | 1       |
| animals | birds | Meliphagidae      | <i>Stomiopera flava</i>              | yellow honeyeater                   |   | C |   | 1       |
| animals | birds | Meropidae         | <i>Merops ornatus</i>                | rainbow bee-eater                   |   | C |   | 6       |
| animals | birds | Monarchidae       | <i>Grallina cyanoleuca</i>           | magpie-lark                         |   | C |   | 5       |
| animals | birds | Monarchidae       | <i>Myiagra inquieta</i>              | restless flycatcher                 |   | C |   | 2       |
| animals | birds | Monarchidae       | <i>Myiagra rubecula</i>              | leaden flycatcher                   |   | C |   | 1       |
| animals | birds | Motacillidae      | <i>Anthus novaeseelandiae</i>        | Australasian pipit                  |   | C |   | 2       |
| animals | birds | Nectariniidae     | <i>Dicaeum hirundinaceum</i>         | mistletoebird                       |   | C |   | 5       |
| animals | birds | Otididae          | <i>Ardeotis australis</i>            | Australian bustard                  |   | C |   | 1       |
| animals | birds | Pachycephalidae   | <i>Colluricincla harmonica</i>       | grey shrike-thrush                  |   | C |   | 2       |
| animals | birds | Pachycephalidae   | <i>Pachycephala rufiventris</i>      | rufous whistler                     |   | C |   | 5       |
| animals | birds | Pardalotidae      | <i>Pardalotus striatus</i>           | striated pardalote                  |   | C |   | 8       |
| animals | birds | Petroicidae       | <i>Melanodryas cucullata</i>         | hooded robin                        |   | C |   | 1       |
| animals | birds | Petroicidae       | <i>Microeca fascinans</i>            | jacky winter                        |   | C |   | 2       |
| animals | birds | Phalacrocoracidae | <i>Phalacrocorax sulcirostris</i>    | little black cormorant              |   | C |   | 1       |
| animals | birds | Podargidae        | <i>Podargus strigoides</i>           | tawny frogmouth                     |   | C |   | 2       |
| animals | birds | Pomatostomidae    | <i>Pomatostomus temporalis</i>       | grey-crowned babbler                |   | C |   | 5       |
| animals | birds | Psittacidae       | <i>Aprosmictus erythropterus</i>     | red-winged parrot                   |   | C |   | 4       |
| animals | birds | Psittacidae       | <i>Platycercus adscitus</i>          | pale-headed rosella                 |   | C |   | 5       |
| animals | birds | Psittacidae       | <i>Platycercus adscitus adscitus</i> | pale-headed rosella (northern form) |   | C |   | 6       |
| animals | birds | Psittacidae       | <i>Trichoglossus moluccanus</i>      | rainbow lorikeet                    |   | C |   | 6       |
| animals | birds | Ptilonorhynchidae | <i>Chlamydera nuchalis</i>           | great bowerbird                     |   | C |   | 4       |
| animals | birds | Rhipiduridae      | <i>Rhipidura albiscapa</i>           | grey fantail                        |   | C |   | 2       |

| Kingdom | Class             | Family          | Scientific Name                                          | Common Name                     | I | Q | A | Records |
|---------|-------------------|-----------------|----------------------------------------------------------|---------------------------------|---|---|---|---------|
| animals | birds             | Rhipiduridae    | <i>Rhipidura leucophrys</i>                              | willie wagtail                  |   | C |   | 5       |
| animals | birds             | Strigidae       | <i>Ninox boobook</i>                                     | southern boobook                |   | C |   | 3       |
| animals | birds             | Tytonidae       | <i>Tyto novaehollandiae</i>                              | masked owl                      |   | C |   | 1       |
| animals | insects           | Nymphalidae     | <i>Euploea corinna</i>                                   | common crow                     |   |   |   | 2       |
| animals | mammals           | Bovidae         | <i>Bos taurus</i>                                        | European cattle                 | Y |   |   | 1       |
| animals | mammals           | Emballonuridae  | <i>Taphozous troughtoni</i>                              | Troughton's sheath-tail bat     |   | C |   | 1       |
| animals | mammals           | Equidae         | <i>Equus caballus</i>                                    | horse                           | Y |   |   | 1       |
| animals | mammals           | Leporidae       | <i>Oryctolagus cuniculus</i>                             | rabbit                          | Y |   |   | 2       |
| animals | mammals           | Macropodidae    | <i>Macropus giganteus</i>                                | eastern grey kangaroo           |   | C |   | 4       |
| animals | mammals           | Macropodidae    | <i>Onychogalea unguifera</i>                             | northern nail-tail wallaby      |   | C |   | 1       |
| animals | mammals           | Macropodidae    | <i>Osphranter antilopinus</i>                            | antilopine wallaroo             |   | C |   | 4       |
| animals | mammals           | Macropodidae    | <i>Osphranter robustus</i>                               | common wallaroo                 |   | C |   | 2       |
| animals | mammals           | Macropodidae    | <i>Wallabia bicolor</i>                                  | swamp wallaby                   |   | C |   | 2       |
| animals | mammals           | Petauridae      | <i>Petaurus norfolcensis</i>                             | squirrel glider                 |   | C |   | 1       |
| animals | mammals           | Phalangeridae   | <i>Trichosurus vulpecula</i>                             | common brushtail possum         |   | C |   | 4       |
| animals | mammals           | Phascolarctidae | <i>Phascolarctos cinereus</i>                            | koala                           |   | E | E | 3       |
| animals | ray-finned fishes | Eleotridae      | <i>Mogurnda mogurnda</i>                                 | northern purplespotted gudgeon  |   |   |   | 1       |
| animals | reptiles          | Agamidae        | <i>Diporiphora australis</i>                             | tommy roundhead                 |   | C |   | 1       |
| animals | reptiles          | Agamidae        | <i>Tympanocryptis sp.</i>                                |                                 |   | C |   | 1       |
| animals | reptiles          | Crocodylidae    | <i>Crocodylus johnstoni</i>                              | Australian freshwater crocodile |   | C |   | 2       |
| animals | reptiles          | Diplodactylidae | <i>Amalosia rhombifer</i>                                | zig-zag gecko                   |   | C |   | 1       |
| animals | reptiles          | Diplodactylidae | <i>Diplodactylus platyurus</i>                           | eastern fat-tailed gecko        |   | C |   | 1       |
| animals | reptiles          | Diplodactylidae | <i>Lucasium steindachneri</i>                            | Steindachner's gecko            |   | C |   | 1       |
| animals | reptiles          | Diplodactylidae | <i>Oedura argentea</i>                                   | silver-eyed velvet gecko        |   | C |   | 5       |
| animals | reptiles          | Diplodactylidae | <i>Oedura castelnaui</i>                                 | northern velvet gecko           |   | C |   | 2       |
| animals | reptiles          | Gekkonidae      | <i>Gehyra dubia</i>                                      | dubious dtella                  |   | C |   | 2       |
| animals | reptiles          | Gekkonidae      | <i>Gehyra einasleighensis</i>                            | Einasleigh rock dtella          |   | C |   | 1       |
| animals | reptiles          | Gekkonidae      | <i>Heteronotia binoei</i>                                | Bynoe's gecko                   |   | C |   | 14      |
| animals | reptiles          | Pygopodidae     | <i>Lialis burtonis</i>                                   | Burton's legless lizard         |   | C |   | 1       |
| animals | reptiles          | Scincidae       | <i>Carlia jarnoldae</i>                                  | lined rainbow-skink             |   | C |   | 2       |
| animals | reptiles          | Scincidae       | <i>Carlia munda</i>                                      | shaded-litter rainbow-skink     |   | C |   | 1       |
| animals | reptiles          | Scincidae       | <i>Cryptoblepharus pannosus</i>                          | ragged snake-eyed skink         |   | C |   | 1       |
| animals | reptiles          | Scincidae       | <i>Cryptoblepharus virgatus</i>                          | striped snake-eyed skink        |   | C |   | 1       |
| animals | reptiles          | Scincidae       | <i>Ctenotus spaldingi</i>                                | straight-browed ctenotus        |   | C |   | 1       |
| animals | reptiles          | Scincidae       | <i>Morethia taeniopleura</i>                             | fire-tailed skink               |   | C |   | 1       |
| animals | reptiles          | Varanidae       | <i>Varanus scalaris</i>                                  | spotted tree monitor            |   | C |   | 1       |
| animals | reptiles          | Varanidae       | <i>Varanus storri</i>                                    | Storr's monitor                 |   | C |   | 1       |
| animals | reptiles          | Varanidae       | <i>Varanus tristis</i>                                   | black-tailed monitor            |   | C |   | 2       |
| animals | uncertain         | Indeterminate   | <i>Indeterminate</i>                                     | Unknown or Code Pending         |   |   |   | 1       |
| plants  | land plants       | Acanthaceae     | <i>Dicliptera armata</i>                                 |                                 |   | C |   | 1/1     |
| plants  | land plants       | Acanthaceae     | <i>Nelsonia campestris</i>                               |                                 |   | C |   | 2/2     |
| plants  | land plants       | Acanthaceae     | <i>Rostellularia adscendens</i>                          |                                 |   | C |   | 2/2     |
| plants  | land plants       | Acanthaceae     | <i>Rostellularia adscendens</i> var. <i>hispida</i>      |                                 |   | C |   | 1/1     |
| plants  | land plants       | Amaranthaceae   | <i>Achyranthes aspera</i>                                |                                 |   | C |   | 1/1     |
| plants  | land plants       | Amaranthaceae   | <i>Alternanthera denticulata</i> var. <i>denticulata</i> |                                 |   | C |   | 1/1     |
| plants  | land plants       | Amaranthaceae   | <i>Alternanthera nana</i>                                | hairy joyweed                   |   | C |   | 1/1     |

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| plants  | land plants | Amaranthaceae    | <i>Amaranthus interruptus</i>                            |                |   | C  |   | 3/3     |
| plants  | land plants | Amaranthaceae    | <i>Gomphrena celosioides</i>                             | gomphrena weed | Y |    |   | 1/1     |
| plants  | land plants | Amaranthaceae    | <i>Gomphrena flaccida</i>                                |                |   | C  |   | 2/2     |
| plants  | land plants | Amaranthaceae    | <i>Gomphrena lanata</i>                                  |                |   | C  |   | 1/1     |
| plants  | land plants | Amaranthaceae    | <i>Ptilotus fusiformis</i>                               |                |   | C  |   | 1/1     |
| plants  | land plants | Amaranthaceae    | <i>Ptilotus psilorhachis</i>                             |                |   | C  |   | 1/1     |
| plants  | land plants | Apocynaceae      | <i>Calotropis procera</i>                                |                | Y |    |   | 1/1     |
| plants  | land plants | Apocynaceae      | <i>Cryptostegia grandiflora</i>                          | rubber vine    | Y |    |   | 3       |
| plants  | land plants | Apocynaceae      | <i>Leichhardtia microlepis</i>                           |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Acanthospermum hispidum</i>                           | star burr      | Y |    |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Blumea saxatilis</i>                                  |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Blumea tenella</i>                                    |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Coronidium lanuginosum</i>                            |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Emilia sonchifolia</i> var. <i>sonchifolia</i>        |                | Y |    |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Peripleura</i>                                        |                |   |    |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Peripleura bicolor</i>                                |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Pluchea dentex</i>                                    | bowl daisy     |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Pluchea punctata</i>                                  |                |   | E  |   | 2/2     |
| plants  | land plants | Asteraceae       | <i>Pluchea rubelliflora</i>                              |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Pterocaulon ciliosum</i>                              |                |   | C  |   | 2/2     |
| plants  | land plants | Asteraceae       | <i>Pterocaulon serrulatum</i> var. <i>velutinum</i>      |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Pterocaulon verbascifolium</i>                        |                |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Sigesbeckia orientalis</i>                            | Indian weed    |   | C  |   | 1/1     |
| plants  | land plants | Asteraceae       | <i>Streptoglossa odora</i>                               |                |   | C  |   | 1/1     |
| plants  | land plants | Blechnaceae      | <i>Blechnum cartilagineum</i>                            | gristle fern   |   | C  |   | 1/1     |
| plants  | land plants | Blechnaceae      | <i>Blechnum orientale</i>                                |                |   | SL |   | 5/4     |
| plants  | land plants | Boraginaceae     | <i>Heliotropium brachygyne</i>                           |                |   | C  |   | 2/2     |
| plants  | land plants | Boraginaceae     | <i>Heliotropium collinum</i>                             |                |   | C  |   | 1/1     |
| plants  | land plants | Boraginaceae     | <i>Heliotropium cunninghamii</i>                         |                |   | C  |   | 1/1     |
| plants  | land plants | Boraginaceae     | <i>Heliotropium tabuliplagae</i>                         |                |   | C  |   | 1/1     |
| plants  | land plants | Boraginaceae     | <i>Heliotropium tenuifolium</i>                          |                |   | C  |   | 1/1     |
| plants  | land plants | Boraginaceae     | <i>Trichodesma zeylanicum</i>                            |                |   | C  |   | 1/1     |
| plants  | land plants | Byblidaceae      | <i>Byblis liniflora</i>                                  |                |   | SL |   | 1/1     |
| plants  | land plants | Byttneriaceae    | <i>Dicarpidium monoicum</i>                              |                |   | C  |   | 1/1     |
| plants  | land plants | Byttneriaceae    | <i>Seringia adenolasia</i>                               |                |   | C  |   | 4/4     |
| plants  | land plants | Byttneriaceae    | <i>Waltheria indica</i>                                  |                |   | C  |   | 1/1     |
| plants  | land plants | Caryophyllaceae  | <i>Polycarpaea corymbosa</i>                             |                |   | C  |   | 1/1     |
| plants  | land plants | Caryophyllaceae  | <i>Polycarpaea corymbosa</i> var. <i>corymbosa</i>       |                |   | C  |   | 1/1     |
| plants  | land plants | Caryophyllaceae  | <i>Polycarpaea spirostylis</i>                           |                |   | C  |   | 2/2     |
| plants  | land plants | Caryophyllaceae  | <i>Polycarpaea spirostylis</i> subsp. <i>spirostylis</i> |                |   | C  |   | 1/1     |
| plants  | land plants | Caryophyllaceae  | <i>Polycarpaea tenax</i>                                 |                |   | C  |   | 2/2     |
| plants  | land plants | Celastraceae     | <i>Siphonodon pendulus</i>                               |                |   | C  |   | 1/1     |
| plants  | land plants | Chrysobalanaceae | <i>Parinari nonda</i>                                    |                |   | C  |   | 2/1     |
| plants  | land plants | Commelinaceae    | <i>Commelina agrostophylla</i>                           |                |   | C  |   | 1/1     |
| plants  | land plants | Convolvulaceae   | <i>Bonamia</i>                                           |                |   |    |   | 2/2     |
| plants  | land plants | Convolvulaceae   | <i>Bonamia media</i>                                     |                |   | C  |   | 1/1     |

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| plants  | land plants | Convolvulaceae | <i>Bonamia multiflora</i>                                |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Evolvulus alsinoides</i> var. <i>decumbens</i>        |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea coptica</i>                                   |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea eriocarpa</i>                                 |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea funicularis</i>                               |                     |   | C |   | 2/2     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea nil</i>                                       |                     | Y |   |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea plebeia</i>                                   | bellvine            |   | C |   | 2/2     |
| plants  | land plants | Convolvulaceae | <i>Ipomoea polymorpha</i>                                |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Jacquemontia</i>                                      |                     |   |   |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Jacquemontia</i> sp. (Fairview R.W.Johnson 4026)      |                     |   | C |   | 2/2     |
| plants  | land plants | Convolvulaceae | <i>Polymeria</i>                                         |                     |   |   |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Polymeria ambigua</i>                                 |                     |   | C |   | 1/1     |
| plants  | land plants | Convolvulaceae | <i>Xenostegia tridentata</i>                             |                     |   | C |   | 1/1     |
| plants  | land plants | Cucurbitaceae  | <i>Citrullus colocynthis</i>                             | colocynth           | Y |   |   | 1/1     |
| plants  | land plants | Cucurbitaceae  | <i>Cucumis althaeoides</i>                               |                     |   | C |   | 1/1     |
| plants  | land plants | Cucurbitaceae  | <i>Cucumis anguria</i> var. <i>anguria</i>               | West Indian gherkin | Y |   |   | 2/2     |
| plants  | land plants | Cucurbitaceae  | <i>Cucumis melo</i>                                      |                     |   | C |   | 1/1     |
| plants  | land plants | Cupressaceae   | <i>Callitris intratropica</i>                            | coast cypress pine  |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Anthelepis undulata</i>                               |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Bulbostylis barbata</i>                               |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus castaneus</i>                                 |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus conicus</i>                                   |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus decompositus</i>                              |                     |   | C |   | 3/2     |
| plants  | land plants | Cyperaceae     | <i>Cyperus difformis</i>                                 | rice sedge          |   | C |   | 2/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus flaccidus</i>                                 |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus haspan</i>                                    |                     |   | C |   | 1       |
| plants  | land plants | Cyperaceae     | <i>Cyperus haspan</i> subsp. <i>juncooides</i>           |                     |   | C |   | 2/2     |
| plants  | land plants | Cyperaceae     | <i>Cyperus javanicus</i>                                 |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Cyperus microcephalus</i> subsp. <i>microcephalus</i> |                     |   | C |   | 2/2     |
| plants  | land plants | Cyperaceae     | <i>Cyperus polystachyos</i>                              |                     |   | C |   | 1       |
| plants  | land plants | Cyperaceae     | <i>Eleocharis atropurpurea</i>                           |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Eleocharis geniculata</i>                             |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis acicularis</i>                           |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis depauperata</i>                          |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis dichotoma</i>                            | common fringe-rush  |   | C |   | 2/1     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis microcarya</i>                           |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis nutans</i>                               |                     |   | C |   | 3/2     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis pauciflora</i>                           |                     |   | C |   | 3/3     |
| plants  | land plants | Cyperaceae     | <i>Fimbristylis sphaerocephala</i>                       |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fuirena ciliaris</i>                                  |                     |   | C |   | 2/1     |
| plants  | land plants | Cyperaceae     | <i>Fuirena incrassata</i>                                |                     |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Fuirena umbellata</i>                                 |                     |   | C |   | 2/1     |
| plants  | land plants | Cyperaceae     | <i>Machaerina rubiginosa</i>                             |                     |   | C |   | 2/1     |
| plants  | land plants | Cyperaceae     | <i>Rhynchospora brownii</i>                              | beak rush           |   | C |   | 1/1     |
| plants  | land plants | Cyperaceae     | <i>Scleria brownii</i>                                   |                     |   | C |   | 2/2     |
| plants  | land plants | Cyperaceae     | <i>Scleria rugosa</i>                                    |                     |   | C |   | 2/1     |

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| plants  | land plants | Dennstaedtiaceae  | <i>Microlepia speluncae</i>                               | cave fern          |   | C  |   | 1/1     |
| plants  | land plants | Dilleniaceae      | <i>Hibbertia lepidota</i>                                 |                    |   | C  |   | 2/2     |
| plants  | land plants | Droseraceae       | <i>Drosera burmanni</i>                                   |                    |   | SL |   | 1/1     |
| plants  | land plants | Ebenaceae         | <i>Diospyros humilis</i>                                  | small-leaved ebony |   | C  |   | 1/1     |
| plants  | land plants | Eriocaulaceae     | <i>Eriocaulon pygmaeum</i>                                |                    |   | C  |   | 1/1     |
| plants  | land plants | Erythroxylaceae   | <i>Erythroxylum ellipticum</i>                            |                    |   | C  |   | 1       |
| plants  | land plants | Euphorbiaceae     | <i>Croton arnhemicus</i>                                  |                    |   | C  |   | 1/1     |
| plants  | land plants | Euphorbiaceae     | <i>Euphorbia hassallii</i>                                |                    |   | C  |   | 1/1     |
| plants  | land plants | Euphorbiaceae     | <i>Euphorbia hirta</i>                                    |                    | Y |    |   | 2/2     |
| plants  | land plants | Euphorbiaceae     | <i>Euphorbia mitchelliana</i> var. <i>mitcheiliana</i>    |                    |   | C  |   | 3/3     |
| plants  | land plants | Euphorbiaceae     | <i>Euphorbia schultzei</i> var. <i>comans</i>             |                    |   | C  |   | 1/1     |
| plants  | land plants | Euphorbiaceae     | <i>Euphorbia schultzei</i> var. <i>schultzei</i>          |                    |   | C  |   | 1/1     |
| plants  | land plants | Gentianaceae      | <i>Canscora diffusa</i>                                   |                    |   | C  |   | 2/2     |
| plants  | land plants | Gleicheniaceae    | <i>Dicranopteris linearis</i>                             |                    |   | C  |   | 1       |
| plants  | land plants | Gleicheniaceae    | <i>Dicranopteris linearis</i> var. <i>linearis</i>        |                    |   | C  |   | 3/3     |
| plants  | land plants | Goodeniaceae      | <i>Goodenia effusa</i>                                    |                    |   | C  |   | 3/3     |
| plants  | land plants | Goodeniaceae      | <i>Goodenia grandiflora</i>                               |                    |   | C  |   | 1/1     |
| plants  | land plants | Goodeniaceae      | <i>Goodenia pumilio</i>                                   |                    |   | C  |   | 1/1     |
| plants  | land plants | Goodeniaceae      | <i>Goodenia redacta</i>                                   |                    |   | C  |   | 3/3     |
| plants  | land plants | Haloragaceae      | <i>Gonocarpus acanthocarpus</i>                           |                    |   | C  |   | 1/1     |
| plants  | land plants | Hemerocallidaceae | <i>Dianella longifolia</i>                                |                    |   | C  |   | 1/1     |
| plants  | land plants | Hernandiaceae     | <i>Gyrocarpus americanus</i>                              |                    |   | C  |   | 1       |
| plants  | land plants | Lamiaceae         | <i>Anisomeles ornans</i>                                  |                    |   | C  |   | 4/4     |
| plants  | land plants | Lamiaceae         | <i>Callicarpa candicans</i>                               |                    |   | C  |   | 3/3     |
| plants  | land plants | Lamiaceae         | <i>Coleus</i>                                             |                    |   |    |   | 2/2     |
| plants  | land plants | Lamiaceae         | <i>Mesosphaerum suaveolens</i>                            |                    | Y |    |   | 2/2     |
| plants  | land plants | Lamiaceae         | <i>Ocimum caryophyllum</i>                                |                    |   | C  |   | 2/2     |
| plants  | land plants | Lamiaceae         | <i>Pityrodia salviifolia</i>                              | pityrodia          |   | C  |   | 1/1     |
| plants  | land plants | Lamiaceae         | <i>Prostanthera</i> sp. (Gilbert River M.D.Godwin+ C4040) |                    |   | C  |   | 4/4     |
| plants  | land plants | Lamiaceae         | <i>Teucrium argutum</i>                                   |                    |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae       | <i>Abrus precatorius</i> subsp. <i>precatorius</i>        |                    |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia</i>                                             |                    |   |    |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia brassii</i>                                     |                    |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia chisholmii</i>                                  |                    |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae       | <i>Acacia drepanocarpa</i> subsp. <i>drepanocarpa</i>     |                    |   | C  |   | 4/4     |
| plants  | land plants | Leguminosae       | <i>Acacia gonoclada</i>                                   |                    |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae       | <i>Acacia hemsleyi</i>                                    |                    |   | C  |   | 4/4     |
| plants  | land plants | Leguminosae       | <i>Acacia holosericea</i>                                 |                    |   | C  |   | 8/8     |
| plants  | land plants | Leguminosae       | <i>Acacia julifera</i> subsp. <i>curvinervia</i>          |                    |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia julifera</i> subsp. <i>gilbertensis</i>         |                    |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia julifera</i> subsp. <i>julifera</i>             |                    |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae       | <i>Acacia leptostachya</i>                                | Townsville wattle  |   | C  |   | 4/4     |
| plants  | land plants | Leguminosae       | <i>Acacia multisiliqua</i>                                |                    |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae       | <i>Acacia neurocarpa</i>                                  |                    |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae       | <i>Acacia orthocarpa</i>                                  |                    |   | C  |   | 6/6     |
| plants  | land plants | Leguminosae       | <i>Acacia platycarpa</i>                                  |                    |   | C  |   | 1/1     |

| Kingdom | Class       | Family      | Scientific Name                                                   | Common Name       | I | Q  | A | Records |
|---------|-------------|-------------|-------------------------------------------------------------------|-------------------|---|----|---|---------|
| plants  | land plants | Leguminosae | <i>Acacia shirleyi</i>                                            | lancewood         |   | C  |   | 2/1     |
| plants  | land plants | Leguminosae | <i>Acacia simsii</i>                                              |                   |   | C  |   | 2/1     |
| plants  | land plants | Leguminosae | <i>Acacia torulosa</i>                                            |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Adenanthera abrosperma</i>                                     |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Aeschynomene americana</i> var. <i>glandulosa</i>              |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Aeschynomene villosa</i>                                       |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Aphyllodium biarticulatum</i>                                  |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Bossiaea armitii</i>                                           |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Cajanus acutifolius</i>                                        |                   |   | C  |   | 7/7     |
| plants  | land plants | Leguminosae | <i>Cajanus scarabaeoides</i> var. <i>scarabaeoides</i>            |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Chamaecrista absus</i>                                         |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Chamaecrista longipes</i>                                      |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Crotalaria aridicola</i> subsp. <i>aridicola</i>               |                   |   | C  |   | 3/3     |
| plants  | land plants | Leguminosae | <i>Crotalaria juncea</i>                                          | sunhemp           | Y |    |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Crotalaria medicaginea</i>                                     | trefoil rattlepod |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Crotalaria medicaginea</i> var. <i>medicaginea</i>             |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i> |                   |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Desmodium brachypodium</i>                                     | large ticktrefoil |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Desmodium filiforme</i>                                        |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Desmodium hannii</i>                                           |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Desmodium pycnotrichum</i>                                     |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Galactia</i> sp. (Myall Creek J.R.Clarkson 4885)               |                   |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Galactia tenuiflora</i> var. <i>lucida</i>                     |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Glycine</i>                                                    |                   |   |    |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Hovea parvicalyx</i>                                           |                   |   | C  |   | 3/3     |
| plants  | land plants | Leguminosae | <i>Indigofera brevidens</i>                                       |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Indigofera colutea</i>                                         | sticky indigo     |   | C  |   | 3/3     |
| plants  | land plants | Leguminosae | <i>Indigofera hirsuta</i>                                         | hairy indigo      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Indigofera linifolia</i>                                       |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Indigofera linnaei</i>                                         | Birdsville indigo |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Indigofera queenslandica</i>                                   |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Indigofera sericovexilla</i>                                   |                   |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Jacksonia ramosissima</i>                                      |                   |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Labichea brassii</i>                                           |                   |   | NT |   | 7/7     |
| plants  | land plants | Leguminosae | <i>Leptosema oxyllobioides</i>                                    |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Macrotyloma axillare</i> var. <i>axillare</i>                  |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Macrotyloma uniflorum</i> var. <i>stenocarpum</i>              |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Neptunia dimorphantha</i>                                      |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Rhynchosia minima</i> var. <i>australis</i>                    |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Senna leptoclada</i>                                           |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Senna occidentalis</i>                                         | coffee senna      | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Sesbania campylocarpa</i>                                      |                   |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Stylosanthes hamata</i>                                        |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Stylosanthes scabra</i>                                        |                   | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae | <i>Tephrosia astragaloides</i>                                    |                   |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae | <i>Tephrosia barbatala</i>                                        |                   |   | C  |   | 1/1     |

| Kingdom | Class       | Family           | Scientific Name                                             | Common Name          | I | Q  | A | Records |
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| plants  | land plants | Leguminosae      | <i>Tephrosia conspicua</i>                                  |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia delestangii</i>                                |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia filipes forma vestita</i>                      |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Tephrosia filipes subsp. filipes</i>                     |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia filipes var. (Mt Blackjack A.R.Bean+ 7332)</i> |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia juncea</i>                                     |                      |   | C  |   | 3/3     |
| plants  | land plants | Leguminosae      | <i>Tephrosia leptoclada</i>                                 |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia macrostachya</i>                               |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Tephrosia sp. (Cobbald Gorge B.S.Wannan 1167)</i>        |                      |   | C  |   | 6/6     |
| plants  | land plants | Leguminosae      | <i>Tephrosia sp. (Pannikan Springs A.R.Bean+ 5612)</i>      |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Tephrosia sp. (Settlement Creek L.J.Brass 272)</i>       |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Uraria lagopodioides</i>                                 |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vachellia clarksoniana</i>                               |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vachellia ditricha</i>                                   |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vachellia farnesiana</i>                                 |                      | Y |    |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vigna lanceolata var. filiformis</i>                     |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vigna radiata var. sublobata</i>                         |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Vigna sp. (Station Creek R.J.Lawn CQ3284)</i>            |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Zornia areolata</i>                                      |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Zornia muriculata subsp. angustata</i>                   |                      |   | C  |   | 2/2     |
| plants  | land plants | Leguminosae      | <i>Zornia prostrata var. prostrata</i>                      |                      |   | C  |   | 1/1     |
| plants  | land plants | Leguminosae      | <i>Zornia stirlingii</i>                                    |                      |   | C  |   | 3/3     |
| plants  | land plants | Lentibulariaceae | <i>Utricularia gibba</i>                                    | floating bladderwort |   | SL |   | 1/1     |
| plants  | land plants | Linderniaceae    | <i>Lindernia aplectra</i>                                   |                      |   | C  |   | 1/1     |
| plants  | land plants | Linderniaceae    | <i>Torenia crustacea</i>                                    |                      |   | C  |   | 1/1     |
| plants  | land plants | Lindsaeaceae     | <i>Lindsaea brachypoda</i>                                  |                      |   | C  |   | 1/1     |
| plants  | land plants | Lindsaeaceae     | <i>Lindsaea ensifolia</i>                                   |                      |   | C  |   | 1       |
| plants  | land plants | Lindsaeaceae     | <i>Lindsaea ensifolia subsp. agatii</i>                     |                      |   | C  |   | 2/2     |
| plants  | land plants | Lindsaeaceae     | <i>Lindsaea ensifolia subsp. ensifolia</i>                  |                      |   | C  |   | 2/2     |
| plants  | land plants | Loganiaceae      | <i>Mitrasacme nidulifera</i>                                |                      |   | C  |   | 1/1     |
| plants  | land plants | Loranthaceae     | <i>Dendrophthoe glabrescens</i>                             |                      |   | C  |   | 1/1     |
| plants  | land plants | Loranthaceae     | <i>Lysiana spathulata subsp. spathulata</i>                 |                      |   | C  |   | 1/1     |
| plants  | land plants | Lycopodiaceae    | <i>Palhinhaea cernua</i>                                    |                      |   | C  |   | 2/2     |
| plants  | land plants | Lygodiaceae      | <i>Lygodium microphyllum</i>                                | snake fern           |   | C  |   | 1/1     |
| plants  | land plants | Lythraceae       | <i>Ammannia baccifera</i>                                   |                      |   | C  |   | 1/1     |
| plants  | land plants | Lythraceae       | <i>Rotala occulitflora</i>                                  |                      |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Abelmoschus ficulneus</i>                                | native rosella       |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Abutilon hannii</i>                                      |                      |   | C  |   | 5/5     |
| plants  | land plants | Malvaceae        | <i>Gossypium nelsonii</i>                                   |                      |   | C  |   | 5/5     |
| plants  | land plants | Malvaceae        | <i>Gossypium sturtianum</i>                                 |                      |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Hibiscus</i>                                             |                      |   |    |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Hibiscus meraukensis</i>                                 | Merauke hibiscus     |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Hibiscus setulosus</i>                                   |                      |   | C  |   | 3/3     |
| plants  | land plants | Malvaceae        | <i>Sida</i>                                                 |                      |   |    |   | 1/1     |
| plants  | land plants | Malvaceae        | <i>Sida cordifolia</i>                                      |                      | Y |    |   | 1/1     |

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| plants  | land plants | Malvaceae       | <i>Sida corrugata</i>                                      |                           |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae       | <i>Sida hackettiana</i>                                    |                           |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae       | <i>Sida macropoda</i>                                      |                           |   | C  |   | 4/4     |
| plants  | land plants | Malvaceae       | <i>Sida pleiantha</i>                                      |                           |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae       | <i>Sida rohlenae</i> subsp. <i>rohlenae</i>                |                           |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae       | <i>Sida</i> sp. (Musselbrook M.B.Thomas+ MRS437)           |                           |   | C  |   | 1/1     |
| plants  | land plants | Malvaceae       | <i>Sida spinosa</i>                                        | spiny sida                | Y | C  |   | 1/1     |
| plants  | land plants | Melastomataceae | <i>Melastoma malabathricum</i> subsp. <i>malabathricum</i> |                           |   | C  |   | 6/5     |
| plants  | land plants | Menyanthaceae   | <i>Nymphoides indica</i>                                   | water snowflake           |   | SL |   | 1/1     |
| plants  | land plants | Moraceae        | <i>Ficus opposita</i>                                      |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Calytrix leptophylla</i>                                |                           |   | C  |   | 4/4     |
| plants  | land plants | Myrtaceae       | <i>Corymbia erythrophloia</i>                              | variable-barked bloodwood |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Corymbia gilbertensis</i>                               | Gilbert River ghost gum   |   | C  |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Corymbia pocillum</i>                                   |                           |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Corymbia serendipita</i>                                |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Corymbia terminalis</i>                                 |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Corymbia tessellaris</i>                                | Moreton Bay ash           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus ammophila</i>                                | sandplain red gum         |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus brassiana</i>                                | Cape York red gum         |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus camaldulensis</i>                            |                           |   | C  |   | 2       |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus camaldulensis</i> subsp. <i>obtusata</i>     |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus chartaboma</i>                               |                           |   | C  |   | 2/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus exserta</i>                                  | Queensland peppermint     |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus leptophleba</i>                              | Molloy red box            |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus microneura</i>                               | Gilbert River box         |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus provecta</i>                                 |                           |   | C  |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus shirleyi</i>                                 |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Eucalyptus whitei</i>                                   | White's ironbark          |   | C  |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Leptospermum pallidum</i>                               |                           |   | NT |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Lithomyrtus hypoleuca</i>                               |                           |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Lithomyrtus retusa</i>                                  |                           |   | C  |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Lophostemon grandiflorus</i> subsp. <i>riparius</i>     |                           |   | C  |   | 3/3     |
| plants  | land plants | Myrtaceae       | <i>Lophostemon suaveolens</i>                              | swamp box                 |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Melaleuca bracteata</i>                                 |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Melaleuca citrolens</i>                                 |                           |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Melaleuca fluviatilis</i>                               |                           |   | C  |   | 2/2     |
| plants  | land plants | Myrtaceae       | <i>Melaleuca leucadendra</i>                               | broad-leaved tea-tree     |   | C  |   | 1       |
| plants  | land plants | Myrtaceae       | <i>Melaleuca viridiflora</i> var. <i>viridiflora</i>       |                           |   | C  |   | 1/1     |
| plants  | land plants | Myrtaceae       | <i>Xanthostemon umbrosus</i>                               |                           |   | C  |   | 3/3     |
| plants  | land plants | Nyctaginaceae   | <i>Boerhavia dominii</i>                                   |                           |   | C  |   | 1/1     |
| plants  | land plants | Nyctaginaceae   | <i>Boerhavia pubescens</i>                                 |                           |   | C  |   | 1/1     |
| plants  | land plants | Onagraceae      | <i>Ludwigia octovalvis</i>                                 | willow primrose           |   | C  |   | 2/1     |
| plants  | land plants | Orchidaceae     | <i>Arthrochilus</i>                                        |                           |   |    |   | 1/1     |
| plants  | land plants | Orchidaceae     | <i>Cymbidium canaliculatum</i>                             |                           |   | SL |   | 3/3     |
| plants  | land plants | Orchidaceae     | <i>Geodorum densiflorum</i>                                | pink nodding orchid       |   | SL |   | 1/1     |
| plants  | land plants | Orobanchaceae   | <i>Striga curviflora</i>                                   |                           |   | C  |   | 1/1     |

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| plants  | land plants | Papaveraceae   | <i>Argemone ochroleuca subsp. ochroleuca</i>         | Mexican poppy       | Y |   |   | 1/1     |
| plants  | land plants | Pentapetaceae  | <i>Melhania brachycarpa</i>                          |                     |   | C |   | 4/4     |
| plants  | land plants | Pentapetaceae  | <i>Melhania oblongifolia</i>                         |                     |   | C |   | 1/1     |
| plants  | land plants | Philydraceae   | <i>Philydrum lanuginosum</i>                         | frogsmouth          |   | C |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Flueggea virosa subsp. melanthesoides</i>         |                     |   | C |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus amarus</i>                            |                     | Y |   |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus hebecarpus</i>                        |                     |   | C |   | 5/5     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus maderaspatensis</i>                   |                     |   | C |   | 5/5     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus minutiflorus</i>                      |                     |   | C |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus trachygynae</i>                       |                     |   | C |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Phyllanthus virgatus</i>                          |                     |   | C |   | 1/1     |
| plants  | land plants | Phyllanthaceae | <i>Synostemon elachophyllus subsp. elachophyllus</i> |                     |   | C |   | 4/4     |
| plants  | land plants | Plantaginaceae | <i>Bacopa floribunda</i>                             |                     |   | C |   | 1/1     |
| plants  | land plants | Plantaginaceae | <i>Scoparia dulcis</i>                               | scoparia            | Y |   |   | 1/1     |
| plants  | land plants | Plantaginaceae | <i>Stemodia lythrifolia</i>                          |                     |   | C |   | 3/3     |
| plants  | land plants | Plumbaginaceae | <i>Plumbago zeylanica</i>                            | native plumbago     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Alloteropsis cimicina</i>                         |                     |   | C |   | 2/2     |
| plants  | land plants | Poaceae        | <i>Alloteropsis semialata</i>                        | cockatoo grass      |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida acuta</i>                                |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida calycina var. calycina</i>               |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida exserta</i>                              |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida hygrometrica</i>                         |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida ingrata</i>                              |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida jerichoensis var. subspinulifera</i>     |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida pruinosa</i>                             |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Aristida warburgii</i>                            |                     |   | C |   | 3/3     |
| plants  | land plants | Poaceae        | <i>Arthragrostis aristispicula</i>                   |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Arundinella nepalensis</i>                        | reedgrass           |   | C |   | 2/1     |
| plants  | land plants | Poaceae        | <i>Arundinella setosa</i>                            |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Bothriochloa bladhii subsp. bladhii</i>           |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Bothriochloa decipiens var. cloncurrrensensis</i> |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Bothriochloa pertusa</i>                          |                     | Y |   |   | 3/3     |
| plants  | land plants | Poaceae        | <i>Brachyachne convergens</i>                        | common native couch |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Chloris lobata</i>                                |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Chloris pumilio</i>                               |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Chrysopogon fallax</i>                            |                     |   | C |   | 2/2     |
| plants  | land plants | Poaceae        | <i>Chrysopogon pallidus</i>                          |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Cleistochloa subjuncea</i>                        |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Cymbopogon ambiguus</i>                           | lemon grass         |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Cymbopogon procerus</i>                           |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria bicornis</i>                            |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria breviglumis</i>                         |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria brownii</i>                             |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria ciliaris</i>                            | summer grass        | Y |   |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria diminuta</i>                            |                     |   | C |   | 1/1     |
| plants  | land plants | Poaceae        | <i>Digitaria minima</i>                              |                     |   | C |   | 2/2     |

| Kingdom | Class       | Family       | Scientific Name                                       | Common Name            | I | Q | A | Records |
|---------|-------------|--------------|-------------------------------------------------------|------------------------|---|---|---|---------|
| plants  | land plants | Poaceae      | <i>Digitaria papposa</i>                              |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Echinochloa colona</i>                             | awnless barnyard grass | Y |   |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Enneapogon lindleyanus</i>                         |                        |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Enneapogon polyphyllus</i>                         | leafy nineawn          |   | C |   | 6/6     |
| plants  | land plants | Poaceae      | <i>Enteropogon unispiceus</i>                         |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eragrostis cilianensis</i>                         |                        | Y |   |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Eragrostis cumingii</i>                            |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eragrostis schultzei</i>                           |                        |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Eragrostis spartanoides</i>                        |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eragrostis speciosa</i>                            |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eragrostis tenellula</i>                           | delicate lovegrass     |   | C |   | 4/4     |
| plants  | land plants | Poaceae      | <i>Eriachne obtusa</i>                                |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eriachne pallescens</i> var. <i>pallescens</i>     |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eriachne</i> sp. (Dugald River B.K.Simon+ 3007)    |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eriachne squarrosa</i>                             |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Eriachne trisetia</i>                              |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Heteropogon contortus</i>                          | black speargrass       |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Heteropogon triticeus</i>                          | giant speargrass       |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Melinis repens</i>                                 | red natal grass        | Y |   |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Mnesithea rottboellioides</i>                      |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Oxychloris scariosa</i>                            | winged chloris         |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Panicum effusum</i>                                |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Panicum robustum</i>                               |                        |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Panicum trichoides</i>                             |                        |   | C |   | 3/3     |
| plants  | land plants | Poaceae      | <i>Paspalidium gracile</i>                            | slender panic          |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Paspalidium rarum</i>                              |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Perotis rara</i>                                   | comet grass            |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Sarga plumosum</i>                                 |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Schizachyrium fragile</i>                          | firegrass              |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Setaria surgens</i>                                |                        |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Sporobolus australasicus</i>                       |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Sporobolus caroli</i>                              | fairy grass            |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Thaumatococcus pubescens</i>                       |                        |   | C |   | 3/3     |
| plants  | land plants | Poaceae      | <i>Themeda quadrivalvis</i>                           | grader grass           | Y |   |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Themeda triandra</i>                               | kangaroo grass         |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Triodia</i>                                        |                        |   |   |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Triodia molesta</i>                                |                        |   | C |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Urochloa holosericea</i> subsp. <i>holosericea</i> |                        |   | C |   | 3/3     |
| plants  | land plants | Poaceae      | <i>Urochloa holosericea</i> subsp. <i>velutina</i>    |                        |   | C |   | 3/3     |
| plants  | land plants | Poaceae      | <i>Urochloa mosambicensis</i>                         | sabi grass             | Y |   |   | 2/2     |
| plants  | land plants | Poaceae      | <i>Urochloa pubigera</i>                              |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Urochloa subquadrifida</i>                         |                        | Y |   |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Urochloa whiteana</i>                              |                        |   | C |   | 1/1     |
| plants  | land plants | Poaceae      | <i>Yakirra pauciflora</i>                             |                        |   | C |   | 1/1     |
| plants  | land plants | Polygalaceae | <i>Comesperma pallidum</i>                            |                        |   | C |   | 1/1     |
| plants  | land plants | Polygalaceae | <i>Polygala pterocarpa</i>                            |                        |   | C |   | 2/2     |

| Kingdom | Class       | Family           | Scientific Name                                         | Common Name       | I | Q  | A | Records |
|---------|-------------|------------------|---------------------------------------------------------|-------------------|---|----|---|---------|
| plants  | land plants | Portulacaceae    | <i>Calandrinia arenicola</i>                            |                   |   | C  |   | 1/1     |
| plants  | land plants | Portulacaceae    | <i>Calandrinia uniflora</i>                             |                   |   | C  |   | 1/1     |
| plants  | land plants | Portulacaceae    | <i>Portulaca australis</i>                              |                   |   | C  |   | 1/1     |
| plants  | land plants | Portulacaceae    | <i>Portulaca bicolor</i>                                |                   |   | C  |   | 1/1     |
| plants  | land plants | Portulacaceae    | <i>Portulaca digyna</i>                                 |                   |   | C  |   | 1/1     |
| plants  | land plants | Proteaceae       | <i>Grevillea decora</i> subsp. <i>decora</i>            |                   |   | C  |   | 4/4     |
| plants  | land plants | Proteaceae       | <i>Hakea arborescens</i>                                |                   |   | C  |   | 1/1     |
| plants  | land plants | Proteaceae       | <i>Persoonia falcata</i>                                |                   |   | C  |   | 1/1     |
| plants  | land plants | Proteaceae       | <i>Xylomelum scottianum</i>                             |                   |   | C  |   | 1/1     |
| plants  | land plants | Pteridaceae      | <i>Cheilanthes caudata</i>                              |                   |   | C  |   | 3/3     |
| plants  | land plants | Pteridaceae      | <i>Cheilanthes nitida</i>                               |                   |   | C  |   | 1/1     |
| plants  | land plants | Pteridaceae      | <i>Cheilanthes pumilio</i>                              |                   |   | C  |   | 2/2     |
| plants  | land plants | Pteridaceae      | <i>Pteris platyzomopsis</i>                             |                   |   | SL |   | 1/1     |
| plants  | land plants | Rhamnaceae       | <i>Alphitonia excelsa</i>                               | soap tree         |   | C  |   | 2/2     |
| plants  | land plants | Rhamnaceae       | <i>Ziziphus mauritiana</i>                              | Indian jujube     | Y |    |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Gardenia tessellaris</i>                             |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Gardenia vilhelmii</i>                               |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Paranotis mitrasacmoides</i> subsp. <i>nigricans</i> |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Pavetta granitica</i>                                |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Psydrax</i>                                          |                   |   |    |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Scleromitron galioides</i>                           |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Spermacoce baileyana</i>                             |                   |   | C  |   | 1/1     |
| plants  | land plants | Rubiaceae        | <i>Spermacoce brachystema</i>                           |                   |   | C  |   | 1/1     |
| plants  | land plants | Rutaceae         | <i>Boronia bowmanii</i>                                 |                   |   | C  |   | 9/9     |
| plants  | land plants | Rutaceae         | <i>Cyanothamnus occidentalis</i>                        |                   |   | C  |   | 1/1     |
| plants  | land plants | Rutaceae         | <i>Drummondita calida</i>                               |                   |   | V  |   | 3/3     |
| plants  | land plants | Rutaceae         | <i>Zieria tenuis</i>                                    |                   |   | C  |   | 2/2     |
| plants  | land plants | Sapindaceae      | <i>Atalaya hemiglauca</i>                               |                   |   | C  |   | 1/1     |
| plants  | land plants | Sapindaceae      | <i>Dodonaea</i>                                         |                   |   |    |   | 5/5     |
| plants  | land plants | Sapindaceae      | <i>Dodonaea filifolia</i>                               |                   |   | C  |   | 3/3     |
| plants  | land plants | Sapindaceae      | <i>Dodonaea hispidula</i> var. <i>hispidula</i>         |                   |   | C  |   | 1/1     |
| plants  | land plants | Sapindaceae      | <i>Dodonaea stenophylla</i>                             |                   |   | C  |   | 1/1     |
| plants  | land plants | Scrophulariaceae | <i>Eremophila longifolia</i>                            | berrigan          |   | C  |   | 1/1     |
| plants  | land plants | Solanaceae       | <i>Datura ferox</i>                                     | fierce thornapple | Y |    |   | 1/1     |
| plants  | land plants | Solanaceae       | <i>Solanum capitaneum</i>                               |                   |   | C  |   | 3/3     |
| plants  | land plants | Solanaceae       | <i>Solanum carduiforme</i>                              |                   |   | V  |   | 4/4     |
| plants  | land plants | Solanaceae       | <i>Solanum crebrispinum</i>                             |                   |   | C  |   | 2/2     |
| plants  | land plants | Sparrmanniaceae  | <i>Corchorus aestuans</i>                               |                   |   | C  |   | 1/1     |
| plants  | land plants | Sparrmanniaceae  | <i>Corchorus sericeus</i> subsp. <i>densiflorus</i>     |                   |   | C  |   | 2/2     |
| plants  | land plants | Sparrmanniaceae  | <i>Grewia savannicola</i>                               |                   |   | C  |   | 1/1     |
| plants  | land plants | Sparrmanniaceae  | <i>Triumfetta</i>                                       |                   |   |    |   | 1/1     |
| plants  | land plants | Sparrmanniaceae  | <i>Triumfetta pentandra</i>                             |                   | Y |    |   | 1/1     |
| plants  | land plants | Sparrmanniaceae  | <i>Triumfetta rhomboidea</i>                            | chinese burr      | Y |    |   | 2/2     |
| plants  | land plants | Stylidiaceae     | <i>Stylidium adenophorum</i>                            |                   |   | SL |   | 1/1     |
| plants  | land plants | Stylidiaceae     | <i>Stylidium tenerum</i>                                |                   |   | SL |   | 3/3     |
| plants  | land plants | Ulmaceae         | <i>Trema tomentosa</i>                                  |                   |   | C  |   | 1/1     |

| Kingdom | Class       | Family         | Scientific Name                              | Common Name | I | Q | A | Records |
|---------|-------------|----------------|----------------------------------------------|-------------|---|---|---|---------|
| plants  | land plants | Ulmaceae       | <i>Trema tomentosa</i> var. <i>tomentosa</i> |             |   | C |   | 1/1     |
| plants  | land plants | Violaceae      | <i>Pigea enneasperma</i>                     |             |   | C |   | 1/1     |
| plants  | land plants | Xyridaceae     | <i>Xyris complanata</i>                      | yellow-eye  |   | C |   | 3/2     |
| plants  | land plants | Zygophyllaceae | <i>Tribulopsis pentandra</i>                 |             |   | C |   | 1/1     |
| plants  | land plants | Zygophyllaceae | <i>Tribulopsis solandri</i>                  |             |   | C |   | 2/2     |

#### CODES

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

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*.

The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*.

The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).

This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.



Queensland Government

Department of Environment and Science

Environmental Reports

## **Biodiversity and Conservation Values**

***Biodiversity Planning Assessments and Aquatic Conservation Assessments***

For the selected area of interest

Longitude: 143.5492 Latitude: -18.9961 with 2 kilometre radius

## Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or Area of Interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "Central co-ordinates" option, the resulting assessment area encompasses an area extending from 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: [biodiversity.planning@des.qld.gov.au](mailto:biodiversity.planning@des.qld.gov.au)

## Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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## Summary Information

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

**Table 1: Area of interest details: Longitude: 143.5492 Latitude: -18.9961**

|                     |                                 |
|---------------------|---------------------------------|
| Size (ha)           | 1,256.55                        |
| Local Government(s) | Etheridge Shire                 |
| Bioregion(s)        | Gulf Plains, Einasleigh Uplands |
| Subregion(s)        | Gilberton Plateau, Kidston      |
| Catchment(s)        | Gilbert                         |

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

**Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments**

| Assessment Type                                   | Assessment Area and Version               |
|---------------------------------------------------|-------------------------------------------|
| Biodiversity Planning Assessment(s)               | Gulf Plains v1.1, Einasleigh Uplands v1.1 |
| Aquatic Conservation Assessment(s) (riverine)     | Eastern Gulf of Carpentaria v1.1          |
| Aquatic Conservation Assessment(s) (non-riverine) | Eastern Gulf of Carpentaria v1.1          |

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

| Biodiversity Status   | Area (Ha) | % of AOI |
|-----------------------|-----------|----------|
| Endangered            | 0.0       | 0.0      |
| Of concern            | 48.76     | 3.88     |
| No concern at present | 1,207.79  | 96.12    |

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

**Table 4: Summary table, biodiversity significance**

| Biodiversity significance   | Area (Ha) | % of AOI |
|-----------------------------|-----------|----------|
| State Habitat for EVNT taxa | 0.0       | 0.0      |
| State                       | 818.42    | 65.13    |
| Regional                    | 0.69      | 0.05     |
| Local or Other Values       | 366.76    | 29.19    |

**Table 5: Non-riverine wetlands intersecting the AOI**

| Non-riverine wetland types intersecting the area of interest | # |
|--------------------------------------------------------------|---|
| (No Records)                                                 |   |

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

**Table 6: Named waterways intersecting the AOI**

| Name        | Permanency    |
|-------------|---------------|
| AGATE CREEK | Non-perennial |

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

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

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

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

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

| Aquatic conservation significance (non-riverine wetlands) | Area (Ha) | % of AOI |
|-----------------------------------------------------------|-----------|----------|
| (No Records)                                              |           |          |

# Biodiversity Planning Assessments

## Introduction

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

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

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

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

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

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

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

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

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

**Table 9: Summary table, biodiversity significance**

| Biodiversity significance   | Area (Ha) | % of AOI |
|-----------------------------|-----------|----------|
| State Habitat for EVNT taxa | 0.0       | 0.0      |
| State                       | 818.42    | 65.13    |
| Regional                    | 0.69      | 0.05     |
| Local or Other Values       | 366.76    | 29.19    |

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

## Diagnostic Criteria

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

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

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

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

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

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

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

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

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

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

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

| Biodiversity significance | Description                                                                                                                                                         | Area (Ha) | % of AOI |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| State                     | Remnant contains an RE that is one of the largest of its type in the bioregion (D1) & Remnant has high connectivity or buffers an endangered RE or Sig. Wetland (G) | 756.43    | 60.2     |
| Local or Other Values     | Refer to diagnostic data for additional information                                                                                                                 | 429.44    | 34.18    |

**Assessment of diagnostic criteria with respect to the AOI**

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

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

| Diagnostic Criteria              | Very High Rating - Area (Ha) | Very High Rating - % of AOI | High Rating - Area (Ha) | High Rating - % of AOI | Medium Rating - Area (Ha) | Medium Rating - % of AOI | Low Rating - Area (Ha) | Low Rating - % of AOI |
|----------------------------------|------------------------------|-----------------------------|-------------------------|------------------------|---------------------------|--------------------------|------------------------|-----------------------|
| A: Habitat for EVNT Taxa         |                              |                             |                         |                        |                           |                          | 1,185.86               | 94.4                  |
| B1: Ecosystem Value (Bioregion)  |                              |                             |                         |                        | 1,185.86                  | 94.4                     |                        |                       |
| B2: Ecosystem Value (Subregion)  |                              |                             |                         |                        | 1,185.86                  | 94.4                     |                        |                       |
| C: Tract Size                    |                              |                             | 1,185.86                | 94.4                   |                           |                          |                        |                       |
| D1: Relative RE Size (Bioregion) | 756.43                       | 60.2                        |                         |                        |                           |                          | 429.43                 | 34.2                  |
| D2: Relative RE Size (Subregion) | 756.43                       | 60.2                        |                         |                        | 0.41                      |                          | 429.02                 | 34.1                  |
| F: Ecosystem Diversity           | 34.13                        | 2.7                         | 1,151.73                | 91.7                   |                           |                          |                        |                       |
| G: Context and Connection        | 1,185.86                     | 94.4                        |                         |                        |                           |                          |                        |                       |

**Other Essential Criteria**

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

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

| Biodiversity significance | Description                                                                                       | Area (Ha) | % of AOI |
|---------------------------|---------------------------------------------------------------------------------------------------|-----------|----------|
| State                     | Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) | 379.3     | 30.19    |
| Regional                  | Refer to Expert Panel data for additional information                                             | 0.69      | 0.05     |

| Biodiversity significance | Description                                                                                       | Area (Ha) | % of AOI |
|---------------------------|---------------------------------------------------------------------------------------------------|-----------|----------|
| Regional                  | Remnant contains Special Biodiversity Values (view Expert Panel data for further information) (I) | 54.04     | 4.3      |

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

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

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

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

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

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

| Expert Panel                    | Very High Rating - Area (Ha) | Very High Rating - % of AOI | High Rating - Area (Ha) | High Rating - % of AOI | Medium Rating - Area (Ha) | Medium Rating - % of AOI | Low Rating - Area (Ha) | Low Rating - % of AOI |
|---------------------------------|------------------------------|-----------------------------|-------------------------|------------------------|---------------------------|--------------------------|------------------------|-----------------------|
| H: Core Habitat Priority Taxa   |                              |                             | 0.69                    | 0.1                    |                           |                          |                        |                       |
| Ia: Centres of Endemism         |                              |                             | 73.24                   | 5.8                    |                           |                          |                        |                       |
| Ib: Wildlife Refugia            | 379.28                       | 30.2                        | 54.04                   | 4.3                    |                           |                          |                        |                       |
| Ic: Disjunct Populations        |                              |                             | 338.99                  | 27.0                   |                           |                          |                        |                       |
| Id: Limits of Geographic Ranges | 265.75                       | 21.1                        |                         |                        |                           |                          |                        |                       |
| Ie: High Species Richness       | 113.53                       | 9.0                         | 319.79                  | 25.4                   |                           |                          |                        |                       |

| Expert Panel                         | Very High Rating<br>- Area (Ha) | Very High Rating<br>- % of AOI | High Rating -<br>Area (Ha) | High Rating -<br>% of AOI | Medium Rating<br>- Area (Ha) | Medium Rating<br>- % of AOI | Low Rating -<br>Area (Ha) | Low Rating -<br>% of AOI |
|--------------------------------------|---------------------------------|--------------------------------|----------------------------|---------------------------|------------------------------|-----------------------------|---------------------------|--------------------------|
| If: Relictual Populations            |                                 |                                |                            |                           |                              |                             |                           |                          |
| Ig: Variation in Species Composition | 113.53                          | 9.0                            | 319.79                     | 25.4                      |                              |                             |                           |                          |
| Ih: Artificial Wetland               |                                 |                                |                            |                           |                              |                             |                           |                          |
| Ii: Hollow Bearing Trees             |                                 |                                | 113.53                     | 9.0                       |                              |                             |                           |                          |
| Ij: Breeding or Roosting Site        | 113.53                          | 9.0                            |                            |                           |                              |                             |                           |                          |
| Ik: Climate Refugia                  |                                 |                                |                            |                           |                              |                             |                           |                          |

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

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

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

The functions of these corridors are:

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

- Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;
- Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;
- Maintaining large scale seasonal/migratory species processes and movement of fauna;
- Maximising connectivity between large tracts/patches of remnant vegetation;
- Identifying key areas for rehabilitation and offsets; and

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

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

- Terrestrial

- Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);
- Follow major watershed/catchment and/or coastal boundaries;
- Incorporate major altitudinal/geological/climatic gradients;
- Include and maximise connectivity between large tracts/patches of remnant vegetation;
- Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

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

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further

information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

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

| Biodiversity Significance | Area (Ha) | % of AOI |
|---------------------------|-----------|----------|
| State                     | 0.0       | 0.0      |
| Regional                  | 0.0       | 0.0      |
| Local                     | 0.0       | 0.0      |

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

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

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

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

### Special Area Decisions

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

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

| Decision Number | Description                                                                                         | Panel Recommended Significance | Criteria Values                                                                                                                                                                                                                        |
|-----------------|-----------------------------------------------------------------------------------------------------|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| euu_I_03        | Riparian ecosystems and associated areas.                                                           | State                          | Ib (wildlife refugia): VERY HIGH<br>Ie (high species richness): VERY HIGH<br>Ig (RE's with distinct variation): VERY HIGH<br>Ii (high density of hollow-bearing trees): HIGH<br>Ij (significant breeding or roosting sites): VERY HIGH |
| euu_I_17        | Agate Creek Pocket                                                                                  | Regional                       | Ia (centre of endemism): HIGH<br>Ib (wildlife refugia): HIGH<br>Ic (disjunct populations): HIGH<br>Ie (high species richness): HIGH<br>Ig (RE's with distinct variation): HIGH                                                         |
| gup_fl_20       | High precision records for priority taxa of Regional significance are contained within the remnant. | Regional                       | Criteria H: HIGH                                                                                                                                                                                                                       |
| gup_I_31        | Gregory Range                                                                                       | State                          | Ib (wildlife refugia): VERY HIGH<br>Ic (disjunct populations): HIGH<br>Id (species at geographic range limit): VERY HIGH<br>Ie (high species diversity): HIGH<br>Ig (REs show distinct variation in species composition): HIGH         |

### Expert panel decision descriptions:

#### euu\_I\_03

Most of the Einasleigh Uplands is dominated by open vegetation on shallow or skeletal soils. Riparian RE's associated with the larger river systems function as important refuges for many species of flora and fauna because of the relatively high

nutrient levels associated with most of these areas, their better moisture balance and their generally well developed vegetation. These mesic ribbons of habitat provide an important seasonal refuge and resources for a variety of species, in particular arboreal mammals, woodland birds, hollow-roosting species and amphibians. Many raptor species preferentially nest in tall riparian trees.

Riparian areas are also biogeographically significant habitat as they allow inland incursions of many east coast species into drier areas on the edge of their geographic range.

Riparian areas were given a 200m buffer with the same significance rating to ensure that adjacent habitat used opportunistically by species using the riparian areas was also included.

This decision includes Landscape decision 4.

#### **ei\_u\_l\_17**

This is an isolated area of high fertility geologies, including basaltic andesites and dolerite, surrounded by siliceous sandstones and acid igneous rocks. The resulting high fertility soils, including black cracking clays, provide a biogeographic isolate, and a refuge for plants and animals. Although poorly known, the area includes restricted and unusual variations of RE's that are otherwise broadly mapped, disjunct and range extension populations of a number of plant species. New flora species have been found here and the potential for further new species of both flora and fauna to be found is very high. The area also contains springs and permanent waterholes. Further investigation is likely to lead to higher value ratings for this area.

#### **gup\_fl\_20**

Remnant contains habitat for priority taxa with high precision records.

#### **gup\_l\_31**

Isolated tableland and dissected plateau system at the northern part of the subregion. Most northerly plateau of the subregion, up to 150m above the surrounding plains. Very little grazing, no water points or fencing. Refugia from grazing, fire and climate.

No data and therefore any vegetation types are a guess. Believed to have interesting fauna. No access. Contains permanent water, suspected swamp wallabies *Wallabia bicolor* at the limit of its range. Most fauna surveys in areas along eastern margin in adjoining Einasleigh Uplands bioregion.

# Aquatic Conservation Assessments

## Introduction

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

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

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

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

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

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

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

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

## Explanation of Criteria

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

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

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

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

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

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

flora species the traits included:

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

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

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

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

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

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

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

## Riverine Wetlands

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

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

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

| Aquatic conservation significance (riverine wetlands) | Area (Ha) | % of AOI |
|-------------------------------------------------------|-----------|----------|
| Very High                                             | 0.0       | 0.0      |

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

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

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

| Criteria                             | Very High Rating - Area (Ha) | Very High Rating - % of AOI | High Rating - Area (Ha) | High Rating - % of AOI | Medium Rating - Area (Ha) | Medium Rating - % of AOI | Low Rating - Area (Ha) | Low Rating - % of AOI |
|--------------------------------------|------------------------------|-----------------------------|-------------------------|------------------------|---------------------------|--------------------------|------------------------|-----------------------|
| 1. Naturalness aquatic               |                              |                             |                         |                        | 1,256.55                  | 100.0                    |                        |                       |
| 2. Naturalness catchment             |                              |                             | 1,256.55                | 100.0                  |                           |                          |                        |                       |
| 3. Diversity and richness            |                              |                             | 1,256.55                | 100.0                  |                           |                          |                        |                       |
| 4. Threatened species and ecosystems |                              |                             | 1,256.55                | 100.0                  |                           |                          |                        |                       |
| 5. Priority species and ecosystems   |                              |                             |                         |                        | 1,256.55                  | 100.0                    |                        |                       |
| 6. Special features                  |                              |                             | 1,256.55                | 100.0                  |                           |                          |                        |                       |
| 7. Connectivity                      |                              |                             | 1,256.55                | 100.0                  |                           |                          |                        |                       |
| 8. Representative-ness               |                              |                             |                         |                        |                           |                          |                        |                       |

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

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

| Decision number | Special feature | Catchment | Criteria/Indicator/Measure               | Conservation rating (1-4) |
|-----------------|-----------------|-----------|------------------------------------------|---------------------------|
| gi_r_ec_07      | Cobbold Gorge   | Gilbert   | 6.1.1, 6.2.1, 6.3.1, 6.3.4, 6.4.1, 7.2.1 | 3, 3, 3, 3, 3, 3          |

*4 is the highest rating/value*

#### Expert panel decision descriptions:

##### gi\_r\_ec\_07

The Cobbold Gorge is located close to the junction with the Robertson River. There is a unique spring located in this gorge. It is recognised that the damming effect associated with organic matter build up that occurs in this area is one that is unique and should be protected. In addition, the area has interesting springs, sandstone faces, and unusual terrestrial ecology. The gorge is also unusual in that it is deep and it is well documented that this gorge is the only significant waterbody in the entire sandstone block (although other waterholes in the region remain unexplored). The gorge contains areas of refugia for fish and freshwater crocodiles *Crocodylus johnstoni*, as well as refugial rainforest flora species in riparian communities. Deep waterholes such as Fish Hole and Cobbold Gorge are recognised for their high freshwater fish diversity (Ecowise Environmental 2007).

## Non-riverine Wetlands

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

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

| Aquatic conservation significance (non-riverine wetlands) | Area (Ha) | % of AOI |
|-----------------------------------------------------------|-----------|----------|
| (No Records)                                              |           |          |

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

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

| Criteria     | Very High Rating<br>- Area (Ha) | Very High Rating<br>- % of AOI | High Rating -<br>Area (Ha) | High Rating -<br>% of AOI | Medium Rating -<br>Area (Ha) | Medium Rating<br>- % of AOI | Low Rating -<br>Area (Ha) | Low Rating -<br>% of AOI |
|--------------|---------------------------------|--------------------------------|----------------------------|---------------------------|------------------------------|-----------------------------|---------------------------|--------------------------|
| (No Records) |                                 |                                |                            |                           |                              |                             |                           |                          |

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

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

| Decision number | Special feature | Catchment | Criteria/Indicator/Measure | Conservation rating (1-4) |
|-----------------|-----------------|-----------|----------------------------|---------------------------|
| (No Records)    |                 |           |                            |                           |

*4 is the highest rating/value*

### Expert panel decision descriptions:

(No Records)

# Threatened and Priority Species

## Introduction

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

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

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

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

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

## Threatened Species

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

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

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

(no results)

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

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

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

## BPA Priority Species

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

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

| Species                      | Common name       | Back on Track rank | Identified flora/fauna |
|------------------------------|-------------------|--------------------|------------------------|
| <i>Acacia orthocarpa</i>     | None              | None               | FL                     |
| <i>Corymbia serendipita</i>  | None              | L                  | FL                     |
| <i>Eucalyptus microneura</i> | Gilbert River box | L                  | FL                     |
| <i>Eucalyptus provecta</i>   | None              | L                  | FL                     |
| <i>Hibbertia lepidota</i>    | None              | None               | FL                     |

| Species                            | Common name | Back on Track rank | Identified flora/fauna |
|------------------------------------|-------------|--------------------|------------------------|
| <i>Phyllanthus maderaspatensis</i> | None        | None               | FL                     |
| <i>Tephrosia astragaloides</i>     | None        | None               | FL                     |
| <i>Tephrosia virens</i>            | None        | None               | FL                     |

*NB. Please note that the list of priority species is based on those species identified in the BPAs, however records for these species may be more recent than the originals used. furthermore, the BPA priority species databases are updated from time to time. At each update, the taxonomic details for all species are amended as necessary to reflect current taxonomic name and/or status changes.*

## ACA Priority Species

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

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

(no results)

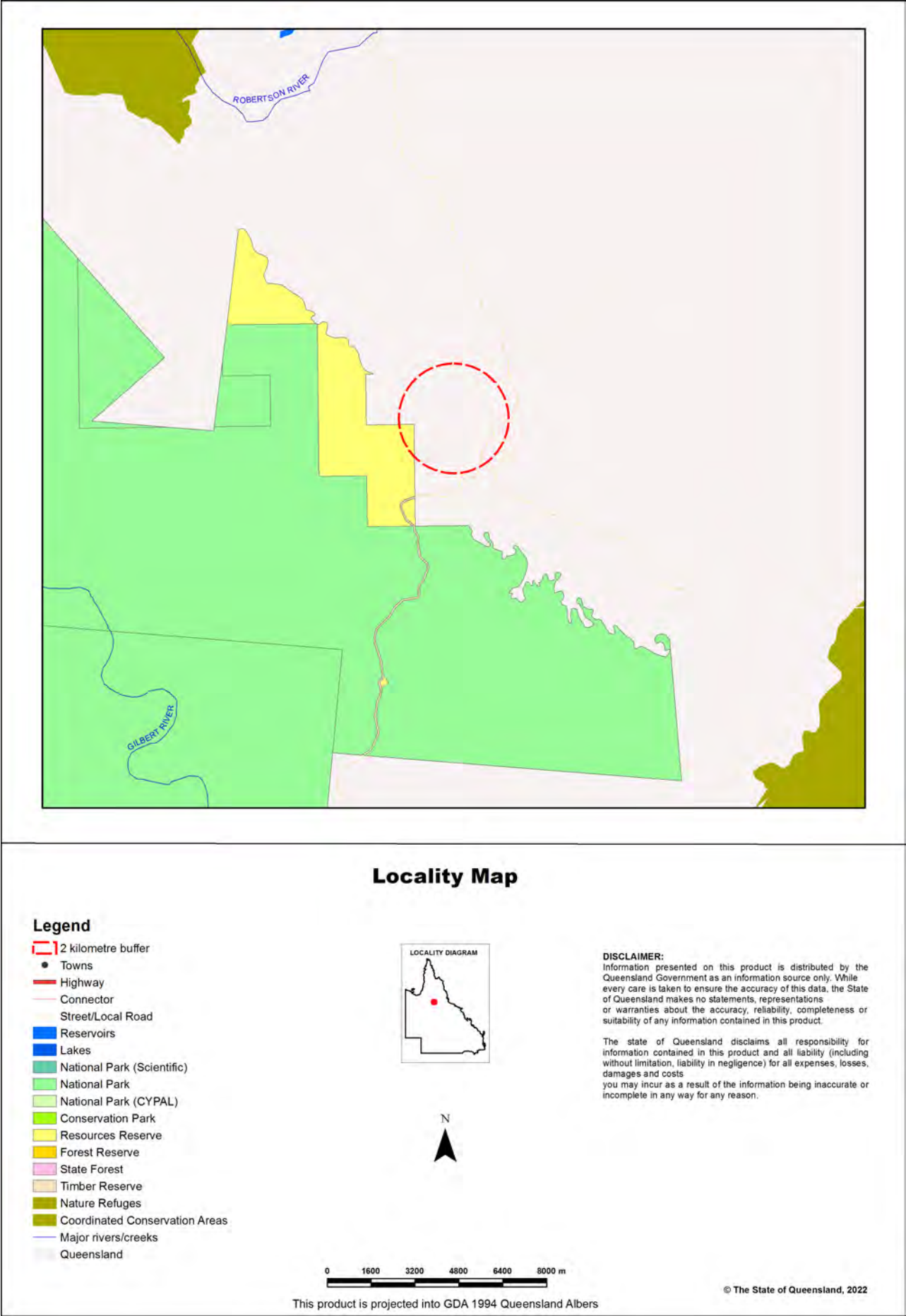
**Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine**

| Species                        | Common name | Back on Track rank | Identified flora/fauna |
|--------------------------------|-------------|--------------------|------------------------|
| <i>Commelina agrostophylla</i> | None        | None               | FL                     |

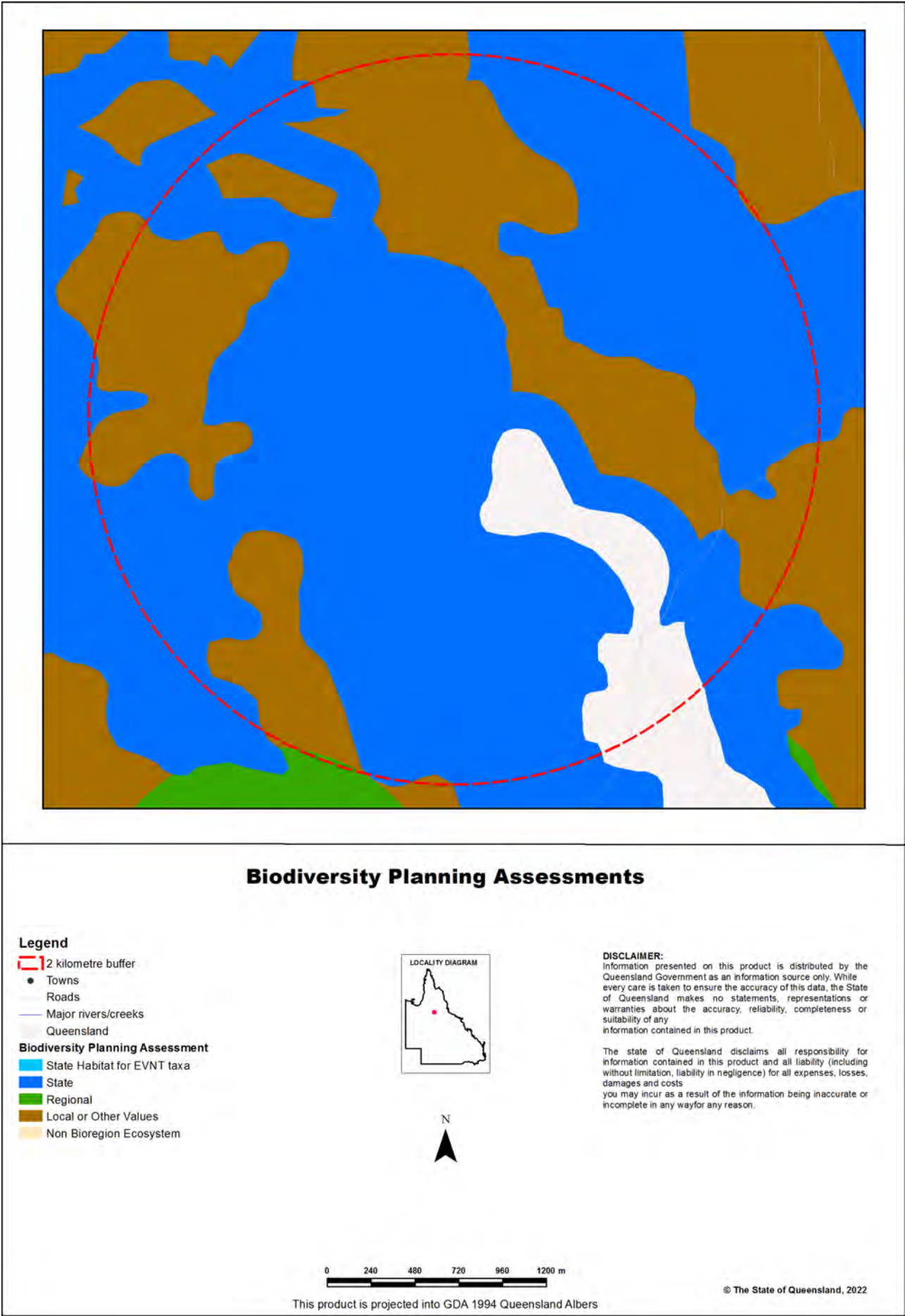
*NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details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

Maps

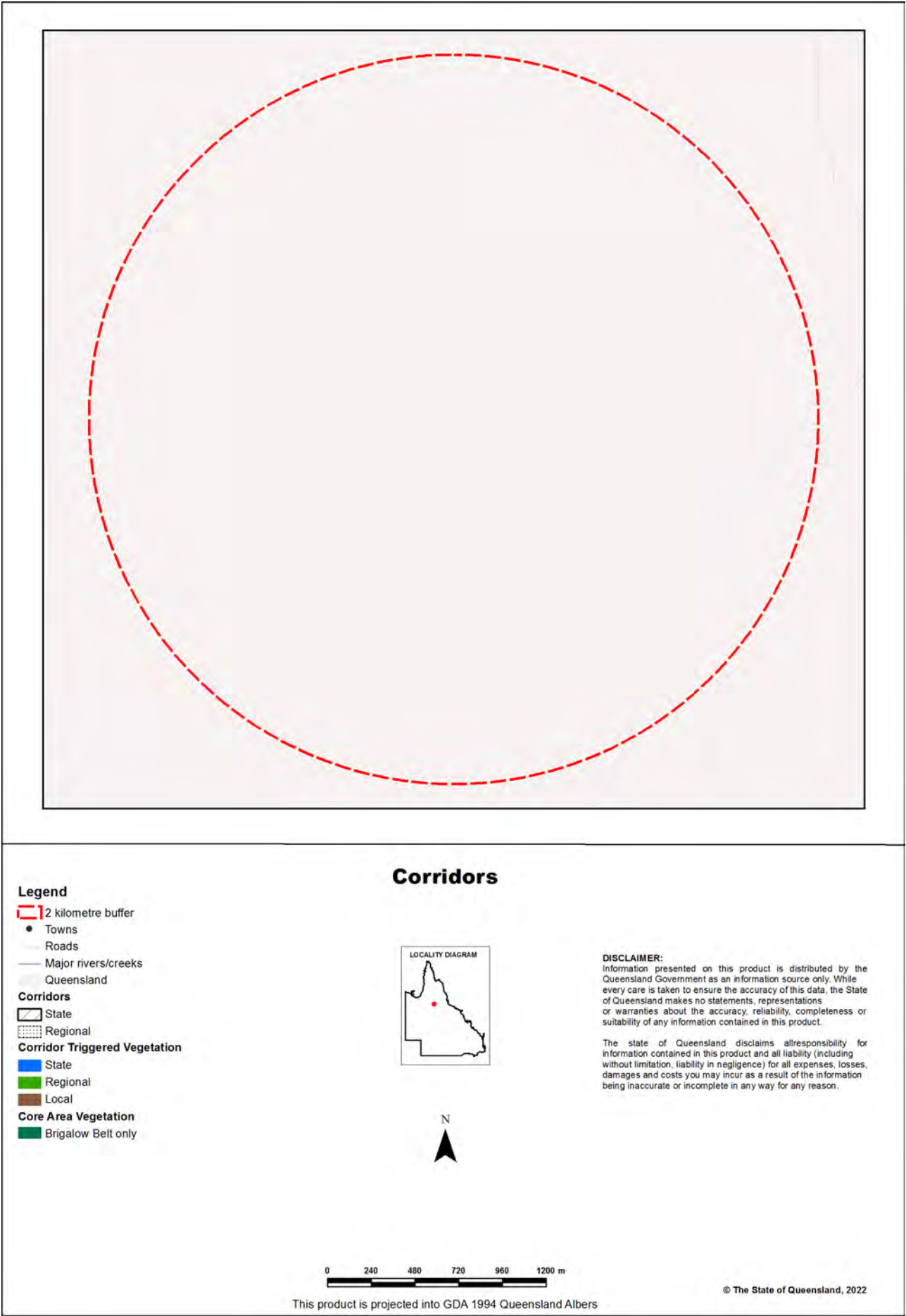
Map 1 - Locality Map



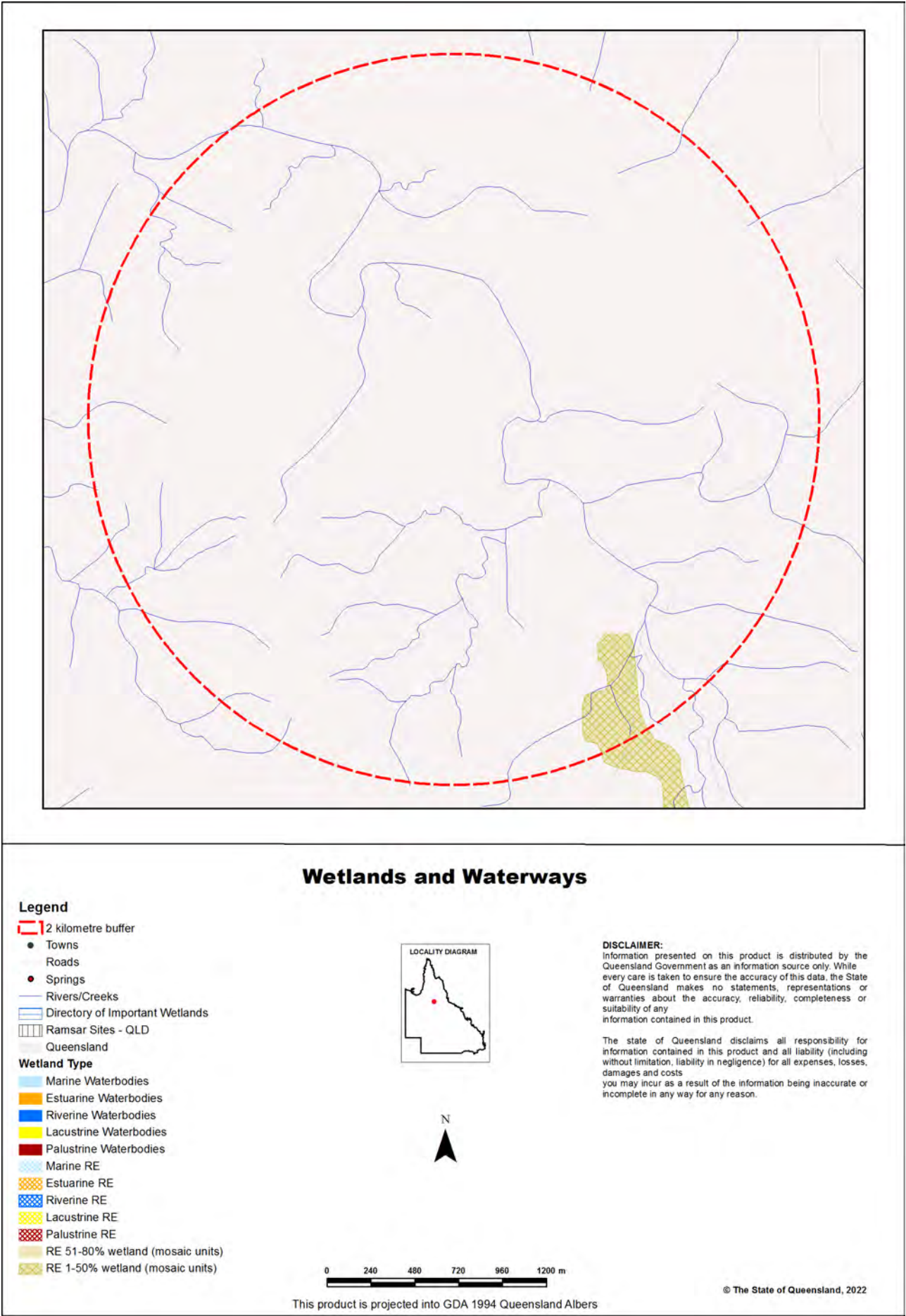
Map 2 - Biodiversity Planning Assessment (BPA)



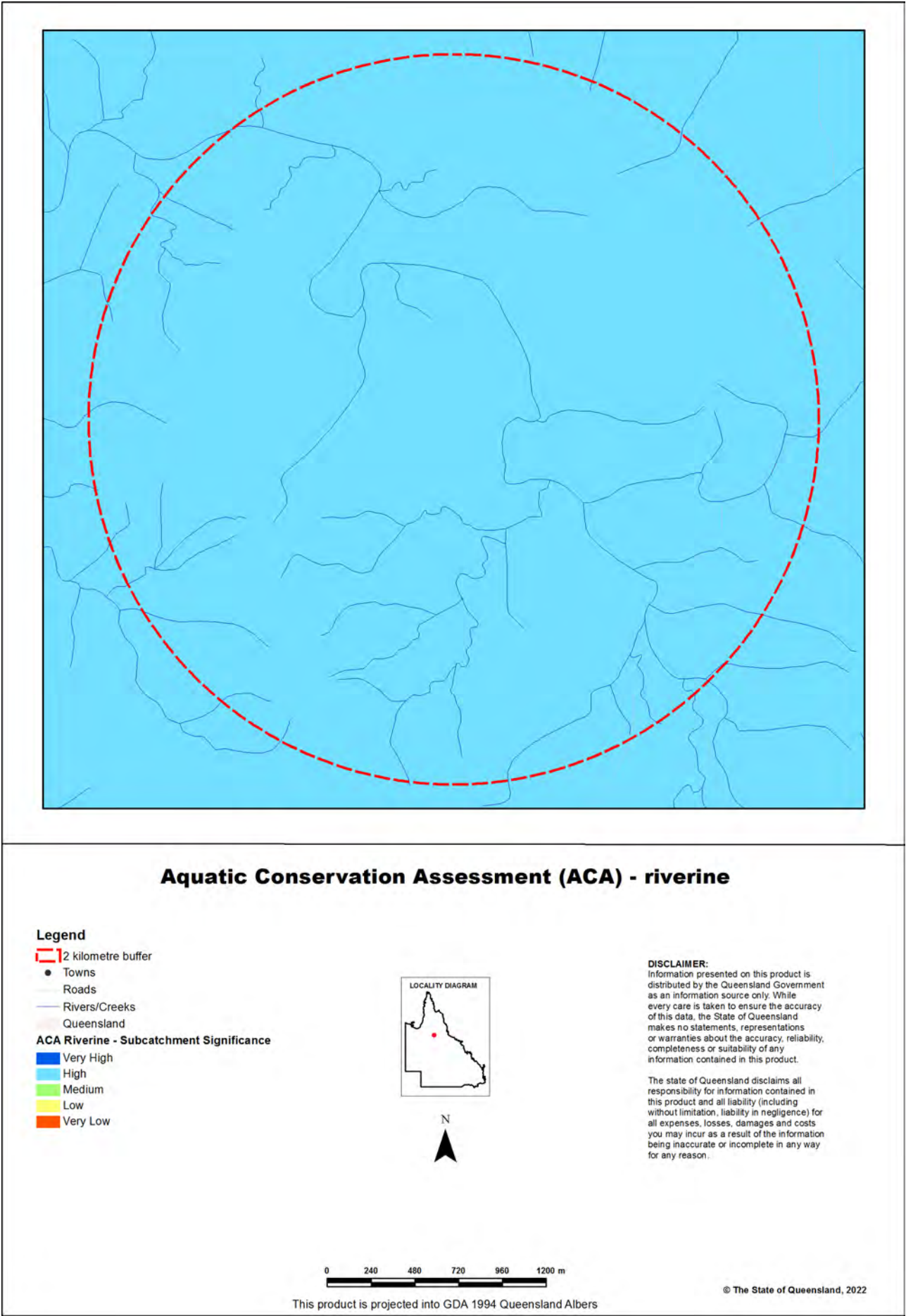
Map 3 - Corridors



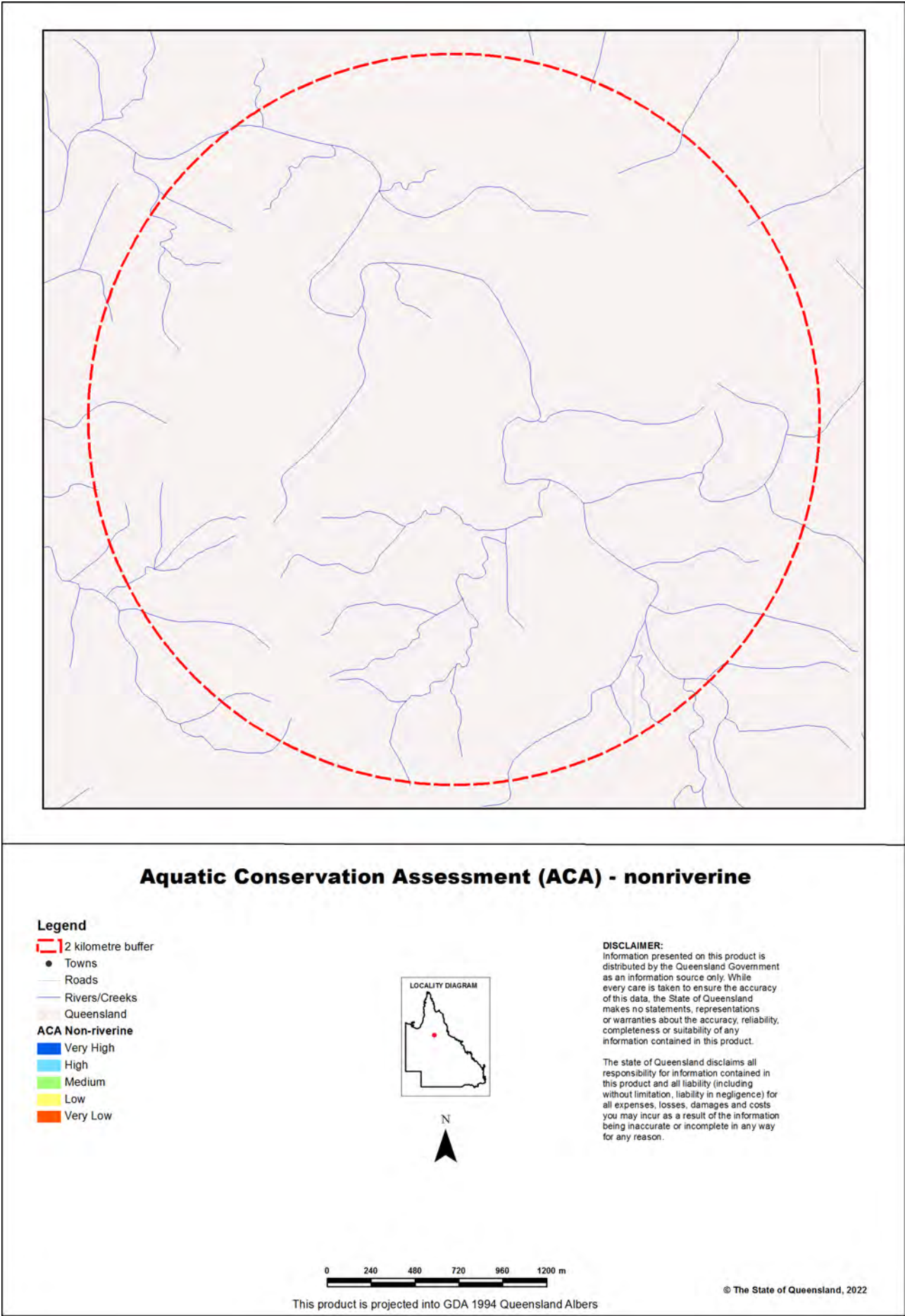
Map 4 - Wetlands and waterways



Map 5 - Aquatic Conservation Assessment (ACA) - riverine



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



---

## References

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

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

Environmental Protection Agency (2002) *Biodiversity Assessment and Mapping Methodology. Version 2.1, July 2002*. (Environmental Protection Agency, Brisbane).

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

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

## Appendices

### Appendix 1 - Source Data

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

\*These datasets are available at:

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

## Appendix 2 - Acronyms and Abbreviations

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



**Queensland** Government

Department of Environment and Science

Environmental Reports

## **Matters of State Environmental Significance**

For the selected area of interest

Longitude: 143.5492 Latitude: -18.9961 with 2 kilometre radius

## Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: [Planning.Support@des.qld.gov.au](mailto:Planning.Support@des.qld.gov.au)

## Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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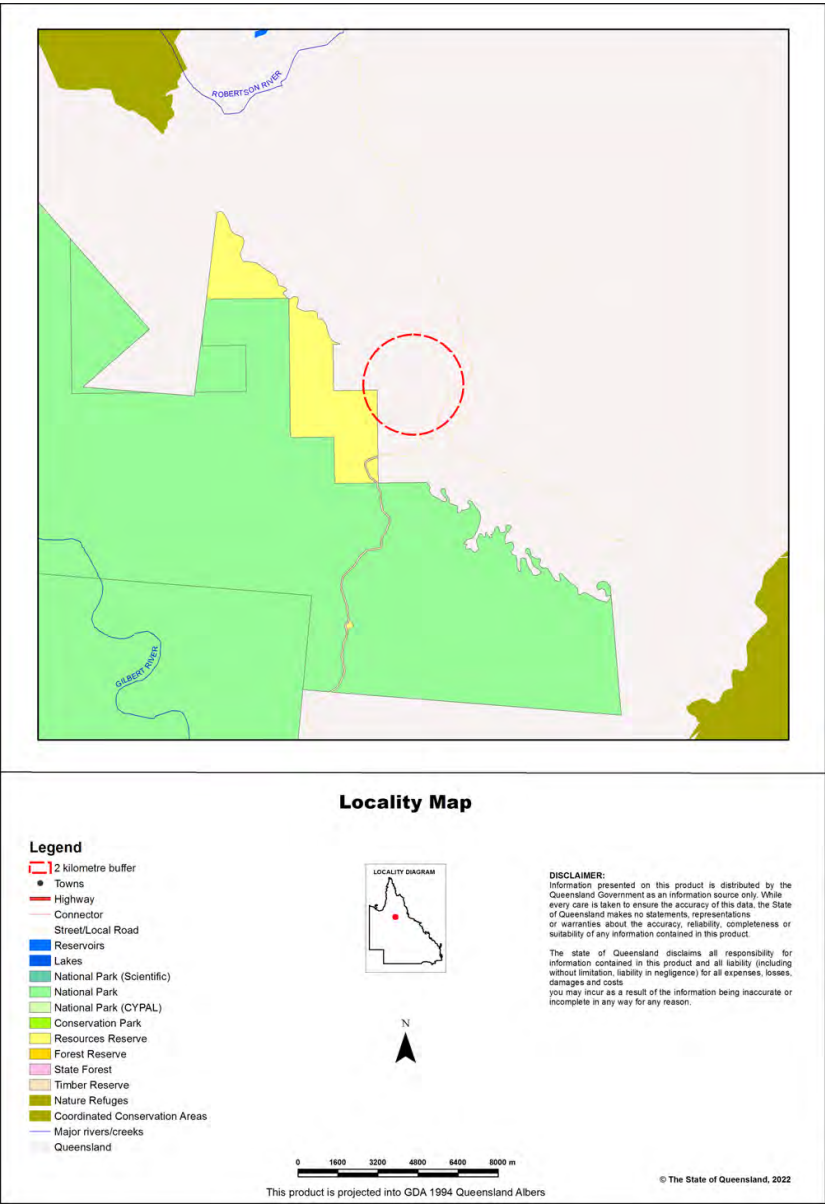
    Appendix 3 - Acronyms and Abbreviations . . . . . 20

## Assessment Area Details

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

**Table 1: Summary table, details for AOI Longitude: 143.5492 Latitude: -18.9961**

|                     |                                 |
|---------------------|---------------------------------|
| Size (ha)           | 1,256.55                        |
| Local Government(s) | Etheridge Shire                 |
| Bioregion(s)        | Gulf Plains, Einasleigh Uplands |
| Subregion(s)        | Gilberton Plateau, Kidston      |
| Catchment(s)        | Gilbert                         |



## Matters of State Environmental Significance (MSES)

### MSES Categories

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

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

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

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;
- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;
- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;
- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;
- Regulated vegetation under the *Vegetation Management Act 1999* that is:
  - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
  - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
  - Category R areas on the regulated vegetation management map;
  - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
  - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;
- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;
- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;
- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

## MSES Values Present

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

**Table 2: Summary of MSES present within the AOI**

|                                                                                                     |          |                |
|-----------------------------------------------------------------------------------------------------|----------|----------------|
| 1a Protected Areas- estates                                                                         | 41.29 ha | 3.3%           |
| 1b Protected Areas- nature refuges                                                                  | 0.0 ha   | 0.0 %          |
| 1c Protected Areas- special wildlife reserves                                                       | 0.0 ha   | 0.0 %          |
| 2 State Marine Parks- highly protected zones                                                        | 0.0 ha   | 0.0 %          |
| 3 Fish habitat areas (A and B areas)                                                                | 0.0 ha   | 0.0 %          |
| 4 Strategic Environmental Areas (SEA)                                                               | 0.0 ha   | 0.0 %          |
| 5 High Ecological Significance wetlands on the map of Referable Wetlands                            | 0.0 ha   | 0.0 %          |
| 6a High Ecological Value (HEV) wetlands                                                             | 0.0 ha   | 0.0 %          |
| 6b High Ecological Value (HEV) waterways                                                            | 0.0 km   | Not applicable |
| 7a Threatened (endangered or vulnerable) wildlife                                                   | 0.0 ha   | 0.0 %          |
| 7b Special least concern animals                                                                    | 0.0 ha   | 0.0 %          |
| 7c i Koala habitat area - core (SEQ)                                                                | 0.0 ha   | 0.0 %          |
| 7c ii Koala habitat area - locally refined (SEQ)                                                    | 0.0 ha   | 0.0 %          |
| 7d Sea turtle nesting areas                                                                         | 0.0 km   | Not applicable |
| 8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)                             | 0.0 ha   | 0.0 %          |
| 8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)                            | 0.0 ha   | 0.0 %          |
| 8c Regulated Vegetation - Category R (GBR riverine regrowth)                                        | 0.0 ha   | 0.0 %          |
| 8d Regulated Vegetation - Essential habitat                                                         | 0.0 ha   | 0.0 %          |
| 8e Regulated Vegetation - intersecting a watercourse                                                | 22.9 km  | Not applicable |
| 8f Regulated Vegetation - within 100m of a Vegetation Management Wetland                            | 0.0 ha   | 0.0 %          |
| 9a Legally secured offset areas- offset register areas                                              | 0.0 ha   | 0.0 %          |
| 9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation | 0.0 ha   | 0.0 %          |

## Additional Information with Respect to MSES Values Present

### MSES - State Conservation Areas

#### 1a. Protected Areas - estates

| Estate name                |
|----------------------------|
| Rungulla Resources Reserve |

#### 1b. Protected Areas - nature refuges

(no results)

#### 1c. Protected Areas - special wildlife reserves

(no results)

#### 2. State Marine Parks - highly protected zones

(no results)

#### 3. Fish habitat areas (A and B areas)

(no results)

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

### MSES - Wetlands and Waterways

#### 4. Strategic Environmental Areas (SEA)

(no results)

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

(no results)

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

(no results)

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

(no results)

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

### MSES - Species

#### 7a. Threatened (endangered or vulnerable) wildlife

Not applicable

#### 7b. Special least concern animals

Not applicable

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

Not applicable

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

Not applicable

#### 7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

#### Threatened (endangered or vulnerable) wildlife habitat suitability models

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

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

#### Threatened (endangered or vulnerable) wildlife species records

(no results)

#### Special least concern animal species records

(no results)

**Shorebird habitat (critically endangered/endangered/vulnerable)**

Not applicable

**Shorebird habitat (special least concern)**

Not applicable

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

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

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

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

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

**MSES - Regulated Vegetation**

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

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

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

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

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

Not applicable

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

Not applicable

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

Not applicable

**8d. Regulated Vegetation - Essential habitat**

Not applicable

**8e. Regulated Vegetation - intersecting a watercourse\*\***

A vegetation management watercourse is mapped as present

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

Not applicable

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

### **MSES - Offsets**

#### **9a. Legally secured offset areas - offset register areas**

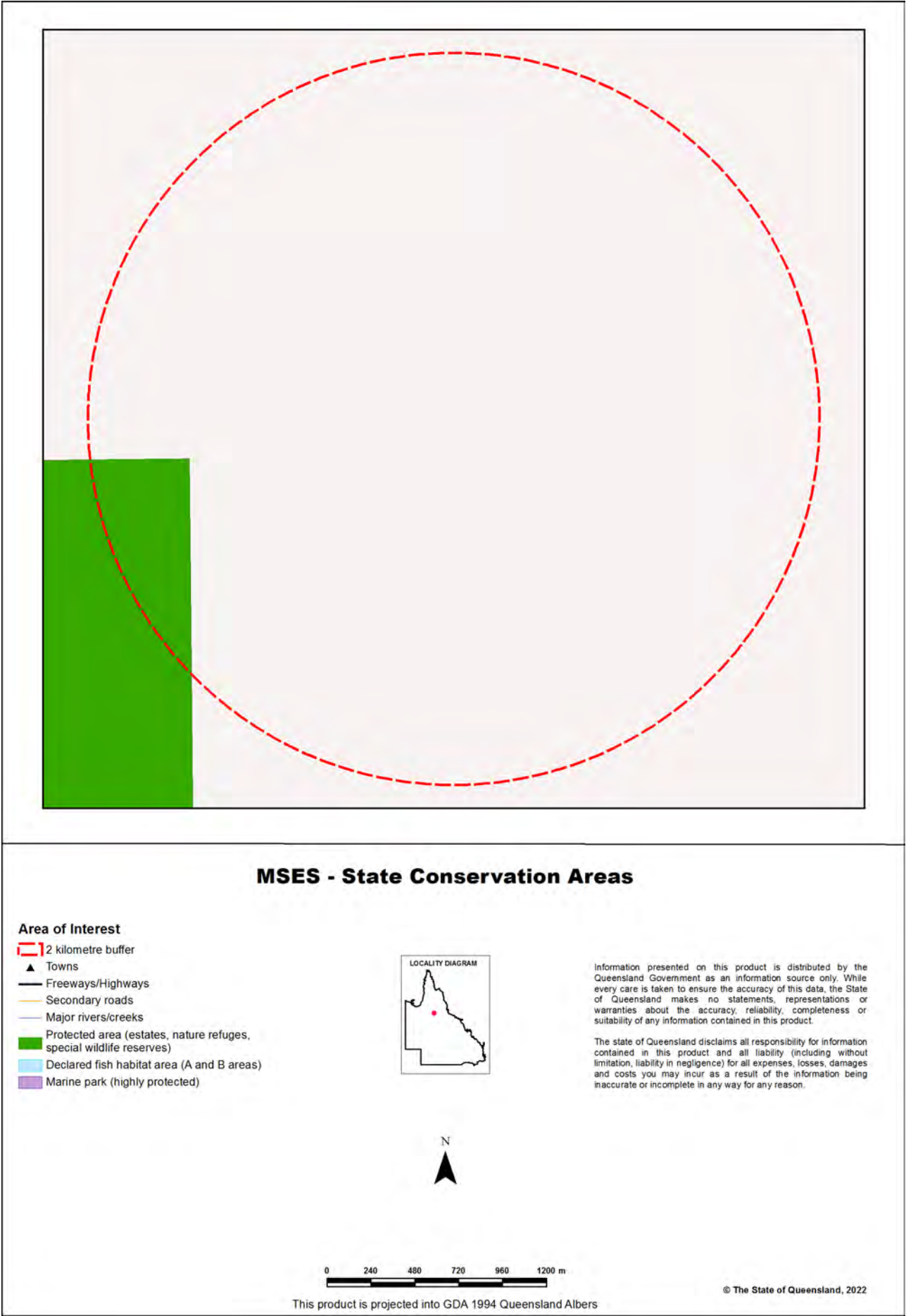
(no results)

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

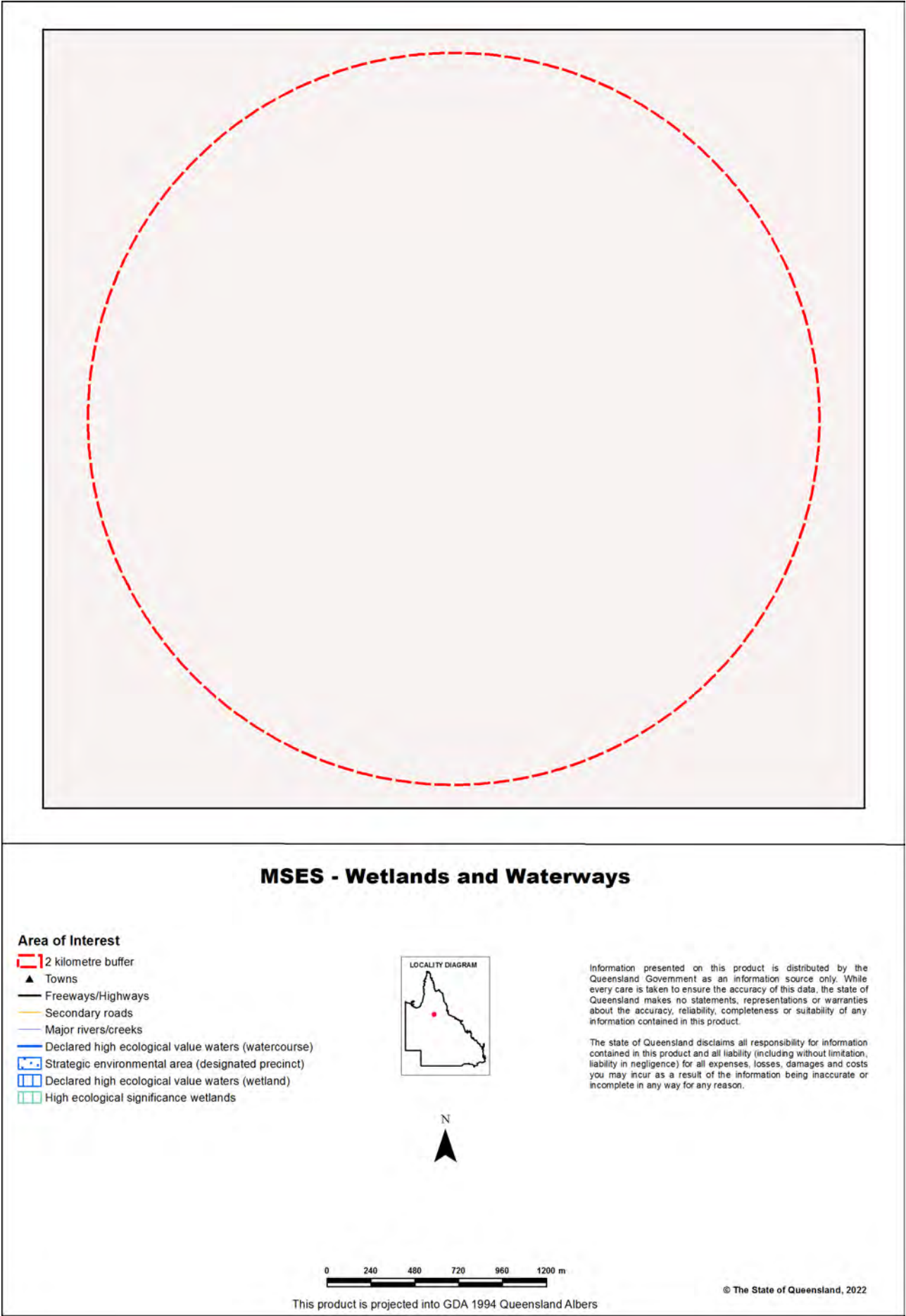
(no results)

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

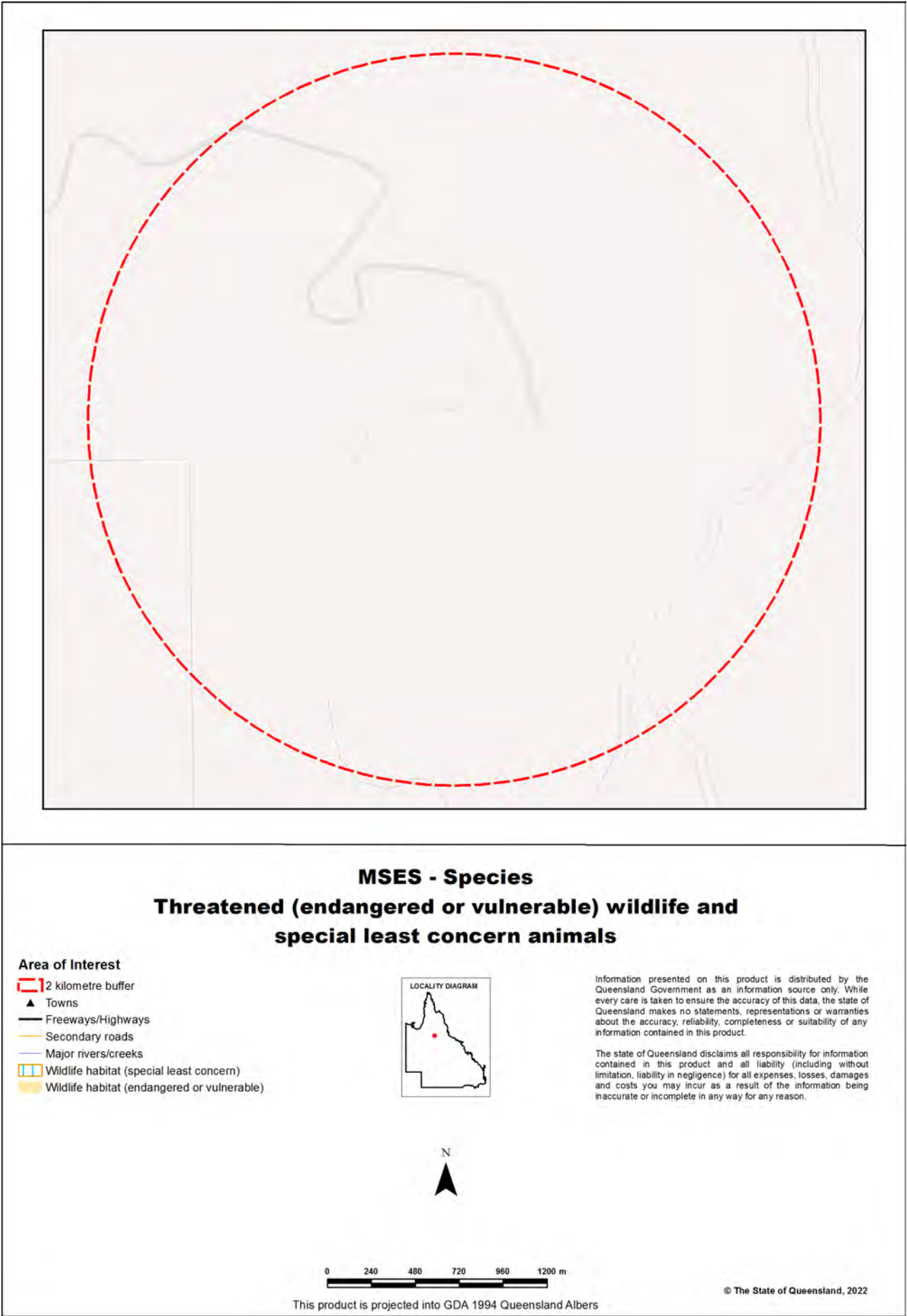
Map 1 - MSES - State Conservation Areas



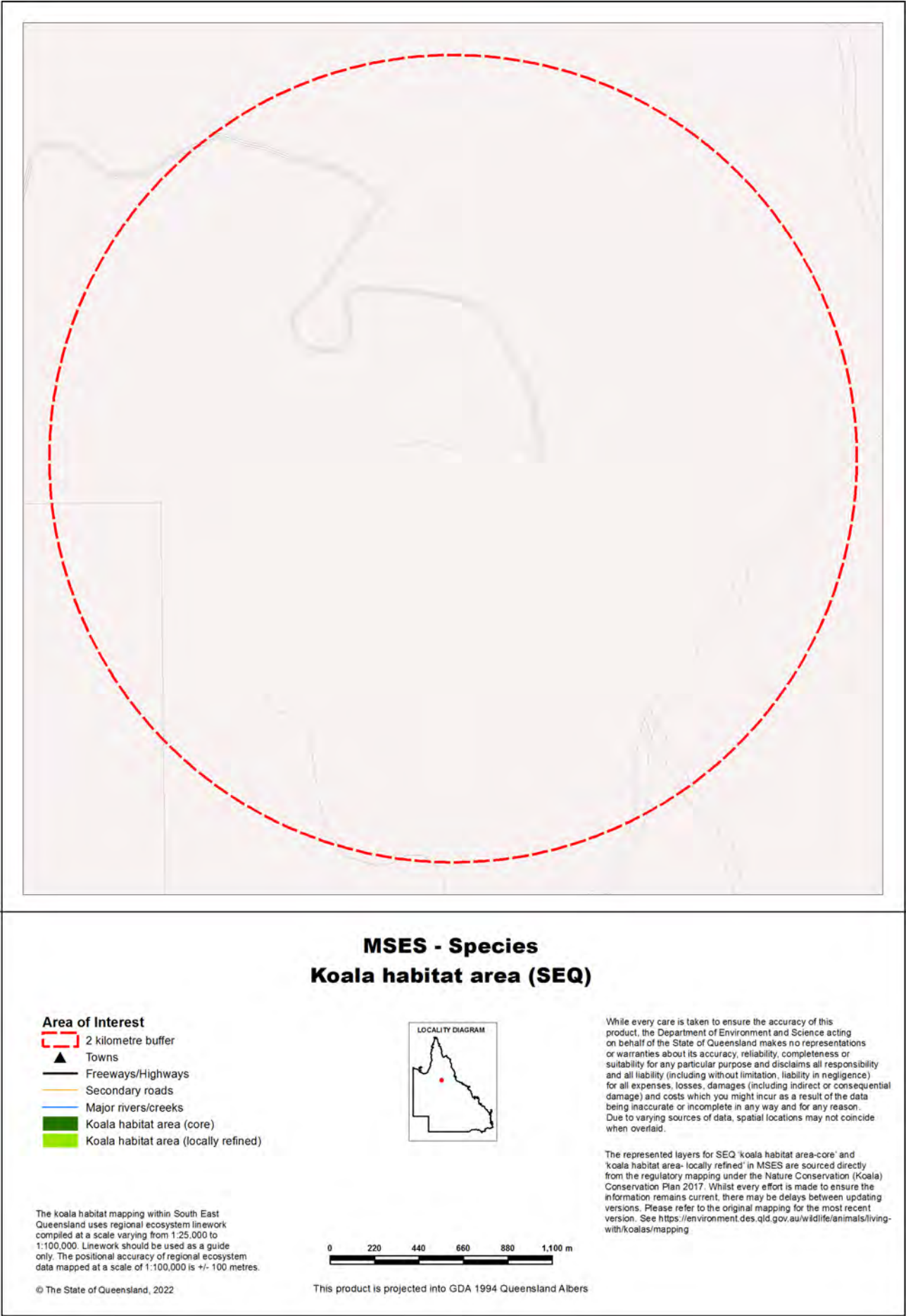
Map 2 - MSES - Wetlands and Waterways



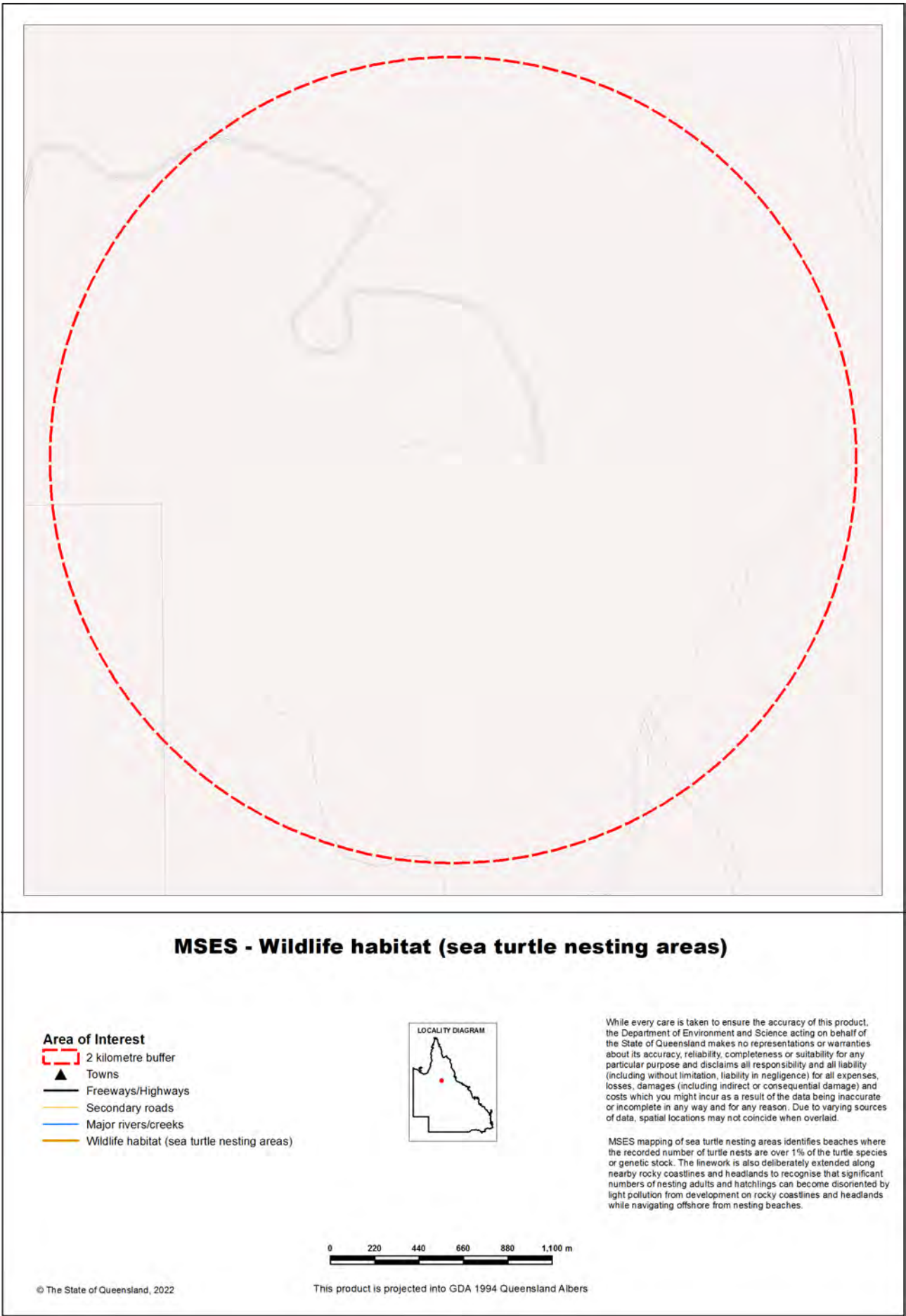
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



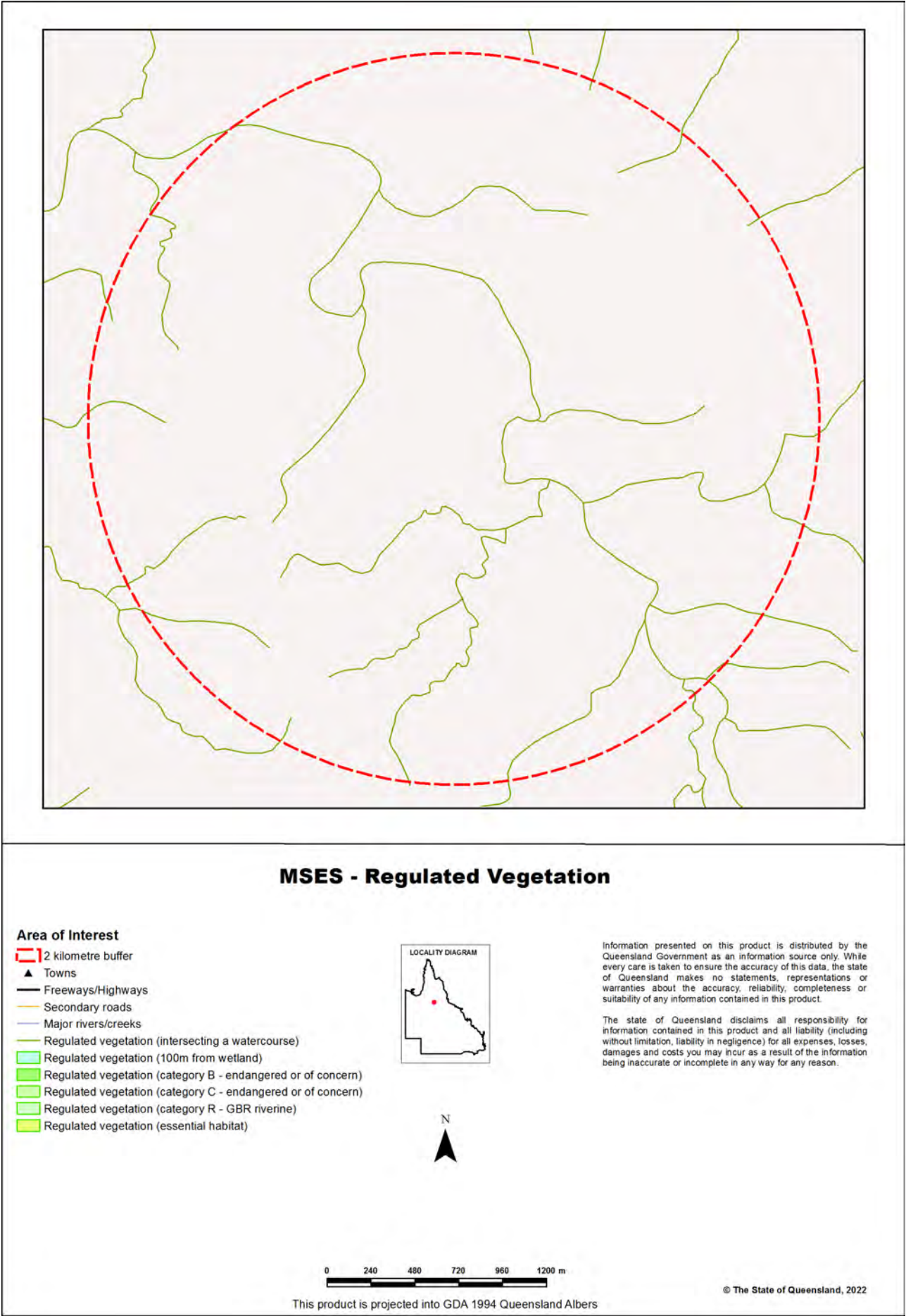
Map 3b - MSES - Species - Koala habitat area (SEQ)



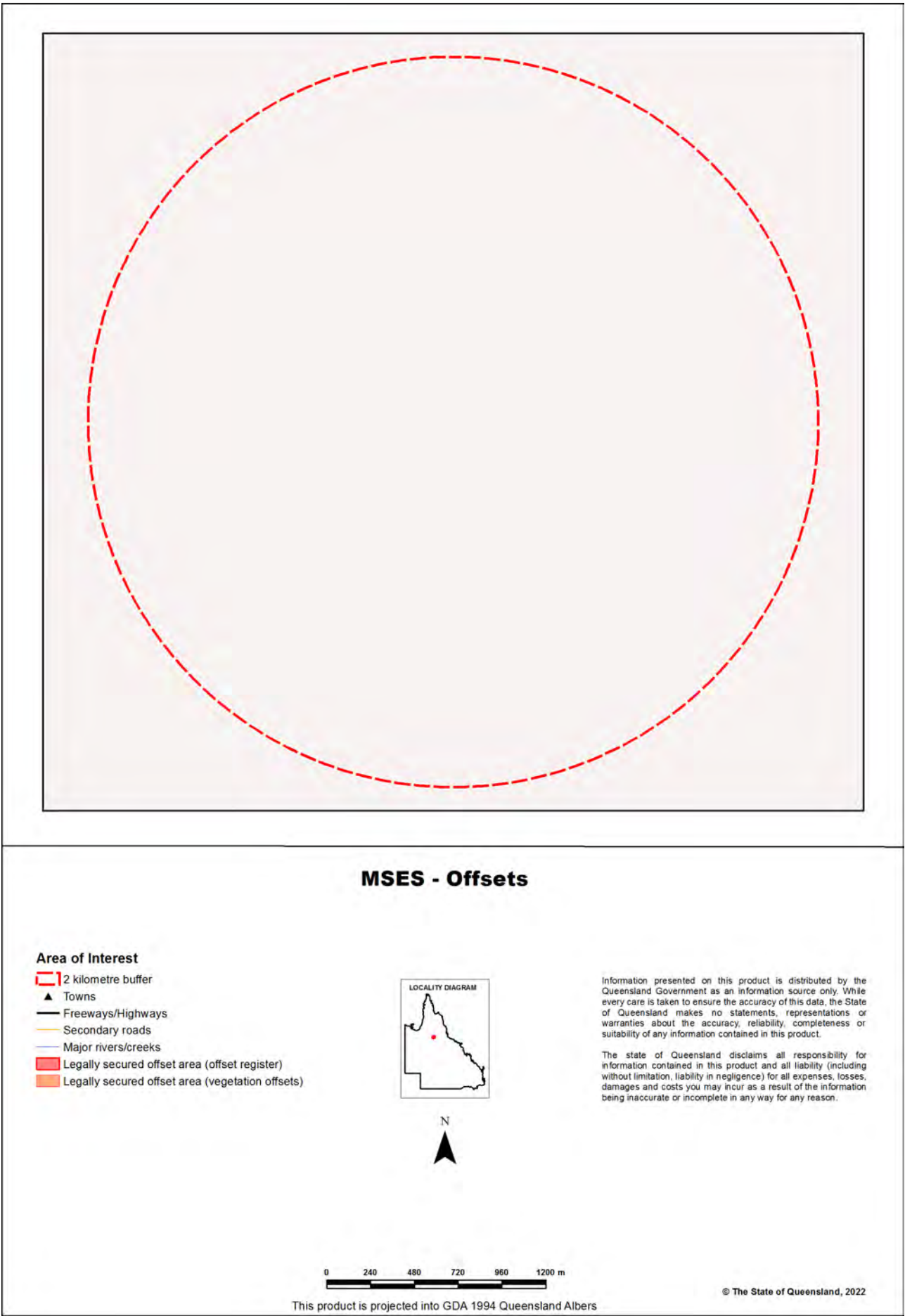
Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)



Map 4 - MSES - Regulated Vegetation



Map 5 - MSES - Offset Areas



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## Appendices

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

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

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

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

## Appendix 2 - Source Data

The datasets listed below are available on request from:

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

- Matters of State environmental significance

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

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

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

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## Appendix 3 - Acronyms and Abbreviations

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



Queensland Government

Department of Environment and Science

Environmental Reports

## **Regional Ecosystems**

### ***Biodiversity Status***

For the selected area of interest

Longitude: 143.5492 Latitude: -18.9961 with 2 kilometre radius

## Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the input coordinates.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no matters of interest have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

## Important Note to User

Information presented in this report is based upon the Queensland Herbarium's Regional Ecosystem framework. The Biodiversity Status has been used to depict the extent of "Endangered", "Of Concern" and "No Concern at Present" regional ecosystems in all cases, rather than the classes used for the purposes of the *Vegetation Management Act 1999* (VMA). Mapping and figures presented in this document reflect the Queensland Herbarium's Remnant and Pre-clearing Regional Ecosystem Datasets, and not the certified mapping used for the purpose of the VMA.

For matters relevant to vegetation management under the VMA, please refer to the Department of Resources website <https://www.dnrme.qld.gov.au/>

Please direct queries about these reports to: [Queensland.Herbarium@qld.gov.au](mailto:Queensland.Herbarium@qld.gov.au)

## Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.



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## Summary Information

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

**Table 1: Area of interest details: Longitude: 143.5492 Latitude: -18.9961 with 2 kilometre radius**

|                     |                                 |
|---------------------|---------------------------------|
| Size (ha)           | 1,256.55                        |
| Local Government(s) | Etheridge Shire                 |
| Bioregion(s)        | Gulf Plains, Einasleigh Uplands |
| Subregion(s)        | Gilberton Plateau, Kidston      |
| Catchment(s)        | Gilbert                         |

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

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

| Biodiversity Status      | Area (Ha) | % of AOI |
|--------------------------|-----------|----------|
| Endangered               | 0.0       | 0.0      |
| Of concern               | 48.76     | 3.88     |
| No concern at present    | 1,207.79  | 96.12    |
| Total remnant vegetation | 1,256.55  | 100.0    |

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

# Regional Ecosystems

## 1. Introduction

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

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

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

<https://www.dnrme.qld.gov.au/>

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

- remnant vegetation is less than 10 per cent of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares, or
- less than 10 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss\*, or
- 10-30 per cent of its pre-clearing extent remains unaffected by severe degradation and/or biodiversity loss and the remnant vegetation is less than 10,000 hectares; or
- it is a rare\*\* regional ecosystem subject to a threatening process.\*\*\*

"Of concern" regional ecosystems are described as those where:

- the degradation criteria listed above for 'Endangered' regional ecosystems are not met and,
- remnant vegetation is 10-30 per cent of its pre-clearing extent across the bioregion; or more than 20 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares, or
- 10-30 percent of its pre-clearing extent remains unaffected by moderate degradation and/or biodiversity loss.\*\*\*\*

and "No concern at present" regional ecosystems are described as those where:

- remnant vegetation is over 30 per cent of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares, and
- the degradation criteria listed above for 'Endangered' or 'Of concern' regional ecosystems are not met.

*\*Severe degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 50 years even with the removal of threatening processes; or soil surface is severely degraded, for example, by loss of A horizon, surface expression of salinity; surface compaction, loss of organic matter or sheet erosion.*

*\*\*Rare regional ecosystem: pre-clearing extent (1000 ha); or patch size (100 ha and of limited total extent across its range).*

*\*\*\*Threatening processes are those that are reducing or will reduce the biodiversity and ecological integrity of a regional ecosystem. For example, clearing, weed invasion, fragmentation, inappropriate fire regime or grazing pressure, or infrastructure development.*

\*\*\*\*Moderate degradation and/or biodiversity loss is defined as: floristic and/or faunal diversity is greatly reduced but unlikely to recover within the next 20 years even with the removal of threatening processes; or soil surface is moderately degraded.

## 2. Remnant Regional Ecosystems

The following table identifies the remnant regional ecosystems and vegetation communities mapped within the AOI and provides their short descriptions, Biodiversity Status, and remnant extent within the selected AOI. Please note, where heterogeneous vegetated patches (mixed patches of remnant vegetation mapped as containing multiple regional ecosystems) occur within the AOI, they have been split and listed as individual regional ecosystems (or vegetation communities where present) for the purposes of the table below. In such instances, associated area figures have been generated based upon the estimated proportion of each regional ecosystem (or vegetation community) predicted to be present within the larger mixed patch.

**Table 3: Remnant regional ecosystems, description and status within the AOI**

| Regional Ecosystem | Short Description                                                                                                                                                              | BD Status             | Area (Ha) | % of AOI |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------|----------|
| 2.10.5a            | Acacia shirleyi woodland and Triodia pungens hummock grassland on scarps and stony ledges                                                                                      | No concern at present | 117.14    | 9.32     |
| 2.10.9             | Rock pavements and outcrops with patches of Acacia spp., Corymbia spp. and Eucalyptus spp. in dissected Mesozoic sandstone ranges.                                             | Of concern            | 34.13     | 2.72     |
| 2.11.1a            | Eucalypt woodland and deciduous woodland on stony hills on folded sediments                                                                                                    | No concern at present | 265.75    | 21.15    |
| 9.11.16            | Eucalyptus crebra +/- Corymbia erythrophloia or C. pocillum woodland on steep to rolling hills                                                                                 | No concern at present | 222.41    | 17.7     |
| 9.11.30b           | Acacia leptostachya low woodland with emergents on stony and rocky metamorphic hills                                                                                           | No concern at present | 29.63     | 2.36     |
| 9.12.11            | Eucalyptus crebra and/or E. whitei +/- Corymbia erythrophloia open woodland on steep to rolling hills on igneous rocks                                                         | No concern at present | 490.68    | 39.05    |
| 9.12.36a           | Cochlospermum gregorii or C. gillivraei deciduous low woodland on rocky outcrops                                                                                               | No concern at present | 25.72     | 2.05     |
| 9.3.20             | Eucalyptus microneura +/- Corymbia spp. +/- E. leptophleba woodland on alluvial plains                                                                                         | No concern at present | 56.04     | 4.46     |
| 9.3.26             | Mixed grassland to open grassland including Eragrostis sp., Aristida sp., Enneapogon sp., Iseilema sp., Chloris sp. or Dichanthium sp. on non-basalt derived alluvial deposits | Of concern            | 14.63     | 1.16     |
| 9.5.10a            | Eucalyptus microneura +/- Terminalia spp. low woodland on sand sheets                                                                                                          | No concern at present | 0.41      | 0.03     |

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

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

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

| Regional Ecosystem | Remnant Extent                                 | BVG (1 Million) | Wetland             | Representation in protected estate |
|--------------------|------------------------------------------------|-----------------|---------------------|------------------------------------|
| 2.10.5a            | Pre-clearing 343000 ha; Remnant 2019 343000 ha | 24a             | Not a Wetland       | High                               |
| 2.10.9             | Pre-clearing 8000 ha; Remnant 2019 8000 ha     | 29b             | Not a Wetland       | High                               |
| 2.11.1a            | Pre-clearing 57000 ha; Remnant 2019 57000 ha   | 13c             | Not a Wetland       | High                               |
| 9.11.16            | Pre-clearing 312000 ha; Remnant 2019 312000 ha | 13c             | Not a Wetland       | Medium                             |
| 9.11.30b           | Pre-clearing 18000 ha; Remnant 2019 18000 ha   | 24a             | Not a Wetland       | High                               |
| 9.12.11            | Pre-clearing 160000 ha; Remnant 2019 160000 ha | 13c             | Not a Wetland       | Low                                |
| 9.12.36a           | Pre-clearing 186000 ha; Remnant 2019 185000 ha | 27c             | Not a Wetland       | Medium                             |
| 9.3.20             | Pre-clearing 44000 ha; Remnant 2019 44000 ha   | 18d             | Not a Wetland       | Low                                |
| 9.3.26             | Pre-clearing 23000 ha; Remnant 2019 22000 ha   | 32a             | Contains Palustrine | Medium                             |
| 9.5.10a            | Pre-clearing 94000 ha; Remnant 2019 93000 ha   | 18d             | Not a Wetland       | Medium                             |

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

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

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

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

| Regional Ecosystem | Special Values                                                                                                                                                                                 |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.10.5a            | Potential habitat for NCA listed species: Drummondita calida, Labichea brassii, Leptospermum pallidum 2.10.5a: Supports plant species with restricted geographic ranges.                       |
| 2.10.9             | None                                                                                                                                                                                           |
| 2.11.1a            | Potential habitat for NCA listed species: Pluchea punctata 2.11.1c: Supports plant species with restricted geographic ranges.                                                                  |
| 9.11.16            | Potential habitat for NCA listed species: Labichea brassii, Macropteranthes montana                                                                                                            |
| 9.11.30b           | None                                                                                                                                                                                           |
| 9.12.11            | None                                                                                                                                                                                           |
| 9.12.36a           | Potential habitat for NCA listed species: Acacia guymeri, Cycas cairnsiana, Euphorbia carissoides, Macropteranthes montana 9.12.36a: Habitat for the vulnerable plant species Cycas cairnsiana |
| 9.3.20             | Significant habitat particularly for herbivores such as macropods and arboreal mammals                                                                                                         |
| 9.3.26             | Significant habitat particularly for herbivores such as macropods and arboreal mammals                                                                                                         |
| 9.5.10a            | None                                                                                                                                                                                           |

### 3. Remnant Regional Ecosystems by Broad Vegetation Group

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

A comprehensive description of BVGs is available at:

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

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

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

| BVG (1 Million) | Description                                                                                                                                                                                                                                                                                                                                                                                                      | Area (Ha) | % of AOI |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|
| 13c             | Woodlands of <i>Eucalyptus crebra</i> (sens. lat.) (narrow-leaved red ironbark), <i>E. drepanophylla</i> (grey ironbark), <i>E. fibrosa</i> (dusky-leaved ironbark), <i>E. shirleyi</i> (shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, [5]) (BRB, EIU, SEQ, NET, CQC)                                                                                              | 978.85    | 77.9     |
| 18d             | Woodlands to low open woodlands dominated by <i>Eucalyptus microneura</i> (Gilbert River box) sometimes with <i>Corymbia</i> spp. (land zones 5, 10, 3, 12) (GUP, EIU)                                                                                                                                                                                                                                           | 56.45     | 4.49     |
| 24a             | Low woodlands to tall shrublands dominated by <i>Acacia</i> spp. on residuals. Species include <i>A. shirleyi</i> (lancewood), <i>A. catenulata</i> (bendee), <i>A. microsperma</i> (bowyakka), <i>A. clivicola</i> , <i>A. sibirica</i> , <i>A. rhodoxylon</i> (rosewood) and <i>A. leptostachya</i> (Townsville wattle). (land zones 7, 10, 5, 12, 11, [9, 3]) (MUL, CHC, BRB, GUP, EIU, MGD, DEU, NWH, [CYP]) | 146.77    | 11.68    |
| 27c             | Low open woodlands dominated by a variety of species including <i>Grevillea striata</i> (beefwood), <i>Acacia</i> spp., <i>Terminalia</i> spp. or <i>Cochlospermum</i> spp. (land zones 9, 12, 3, 11, 5) (NWH, EIU, DEU, GUP, [BRB])                                                                                                                                                                             | 25.72     | 2.05     |
| 29b             | Open shrublands to open heaths in montane frequently rocky locations. (land zones 7, 12, 11, 5, 8, 10) (BRB, NWH, WET, CYP, EIU, SEQ, DEU, [NET, CQC])                                                                                                                                                                                                                                                           | 34.13     | 2.72     |
| 32a             | Closed tussock grasslands dominated by <i>Themeda arguens</i> , <i>Dichanthium sericeum</i> (Queensland bluegrass) or <i>Panicum</i> spp., <i>Eriachne</i> spp., <i>Fimbristylis</i> spp., <i>Aristida</i> spp. or <i>Imperata cylindrica</i> (blady grass) on marine and alluvial plains. (land zones 3, [5]) (GUP, CYP, [BRB, EIU, WET, CQC])                                                                  | 14.63     | 1.16     |

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

### 4. Technical and BioCondition Benchmark Descriptions

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

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

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

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

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

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

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

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

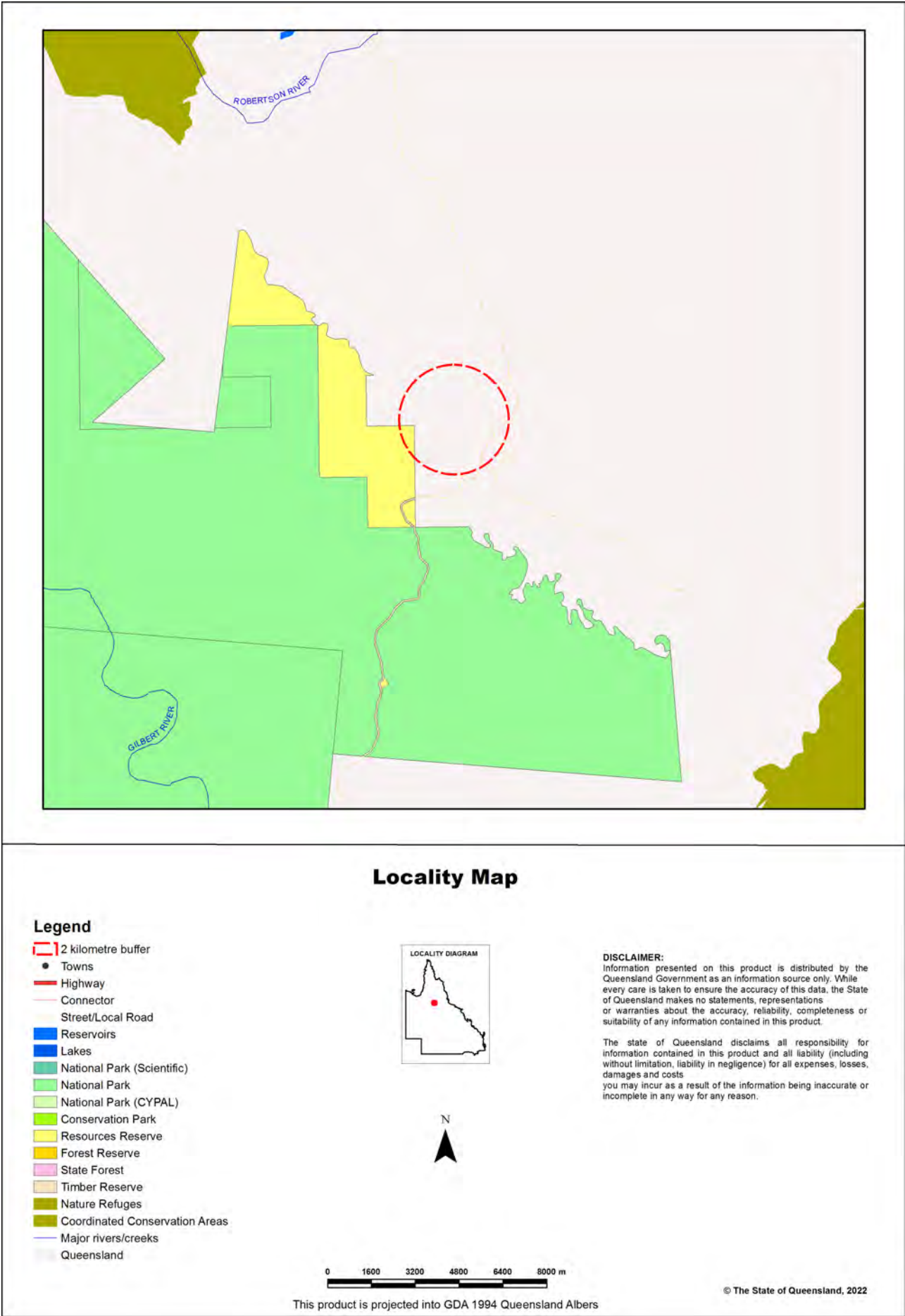
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance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

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

| Regional ecosystems mapped as within the AOI | Technical Descriptions  | Biocondition Benchmarks |
|----------------------------------------------|-------------------------|-------------------------|
| 2.10.5a                                      | Not currently available | Not currently available |
| 2.10.9                                       | Not currently available | Not currently available |
| 2.11.1a                                      | Not currently available | Not currently available |
| 9.11.16                                      | Available               | Not currently available |
| 9.11.30b                                     | Not currently available | Not currently available |
| 9.12.11                                      | Available               | Not currently available |
| 9.12.36a                                     | Available               | Not currently available |
| 9.3.20                                       | Available               | Not currently available |
| 9.3.26                                       | Not currently available | Not currently available |
| 9.5.10a                                      | Available               | Not currently available |

Maps

Map 1 - Location



**Remnant 2019 Regional Ecosystems**

**Biodiversity Status**

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

**LOCALITY DIAGRAM**

**Scale:** 0 0.25 0.5 0.75 1 km

**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 line work 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 line work is 100 metres.**

**Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil. The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".**

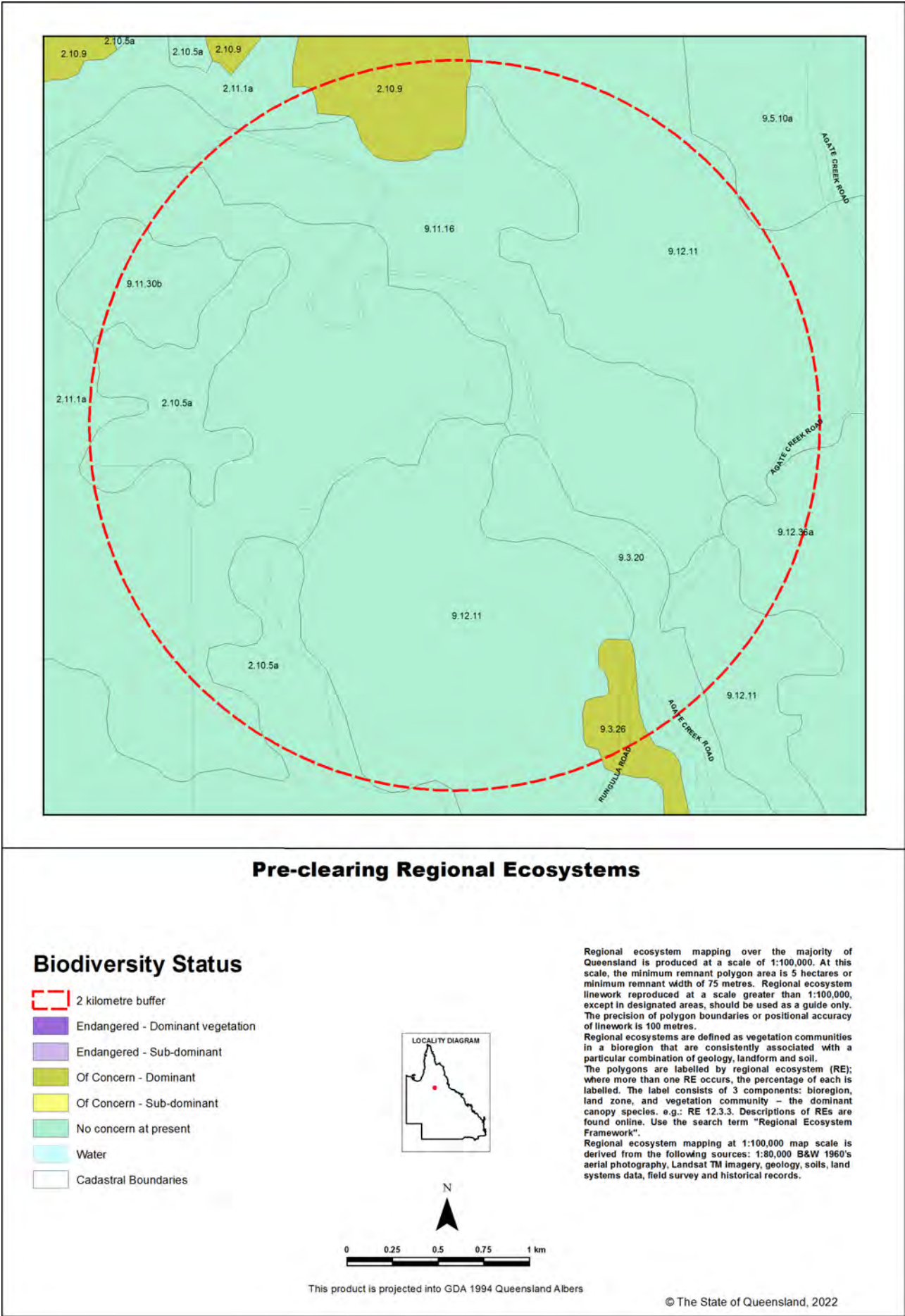
**Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 B&W 1960's aerial photography, Landsat TM imagery, geology, soils, land systems data, field survey and historical records.**

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

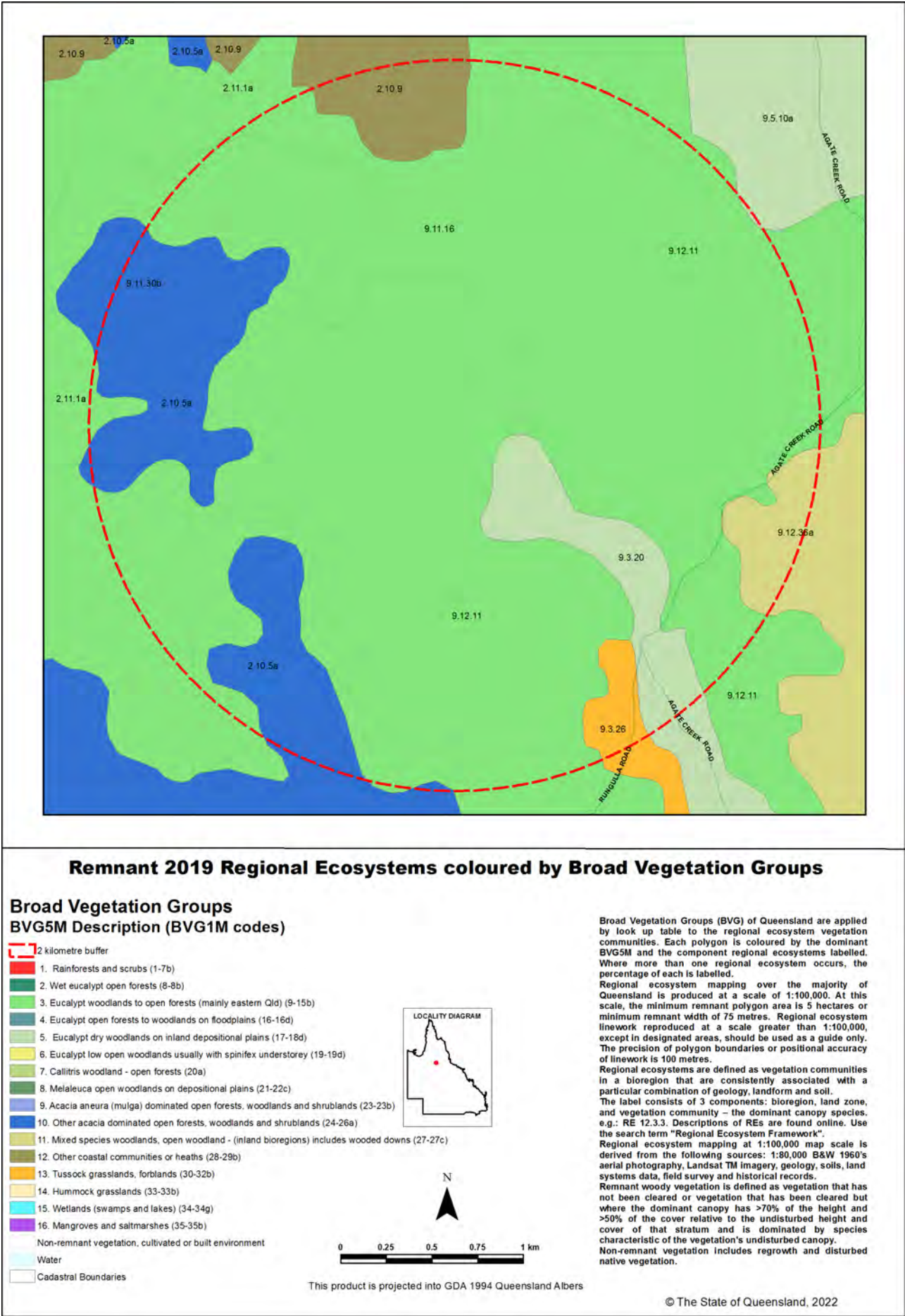
**This product is projected into GDA 1994 Queensland Albers**

**© The State of Queensland, 2022**

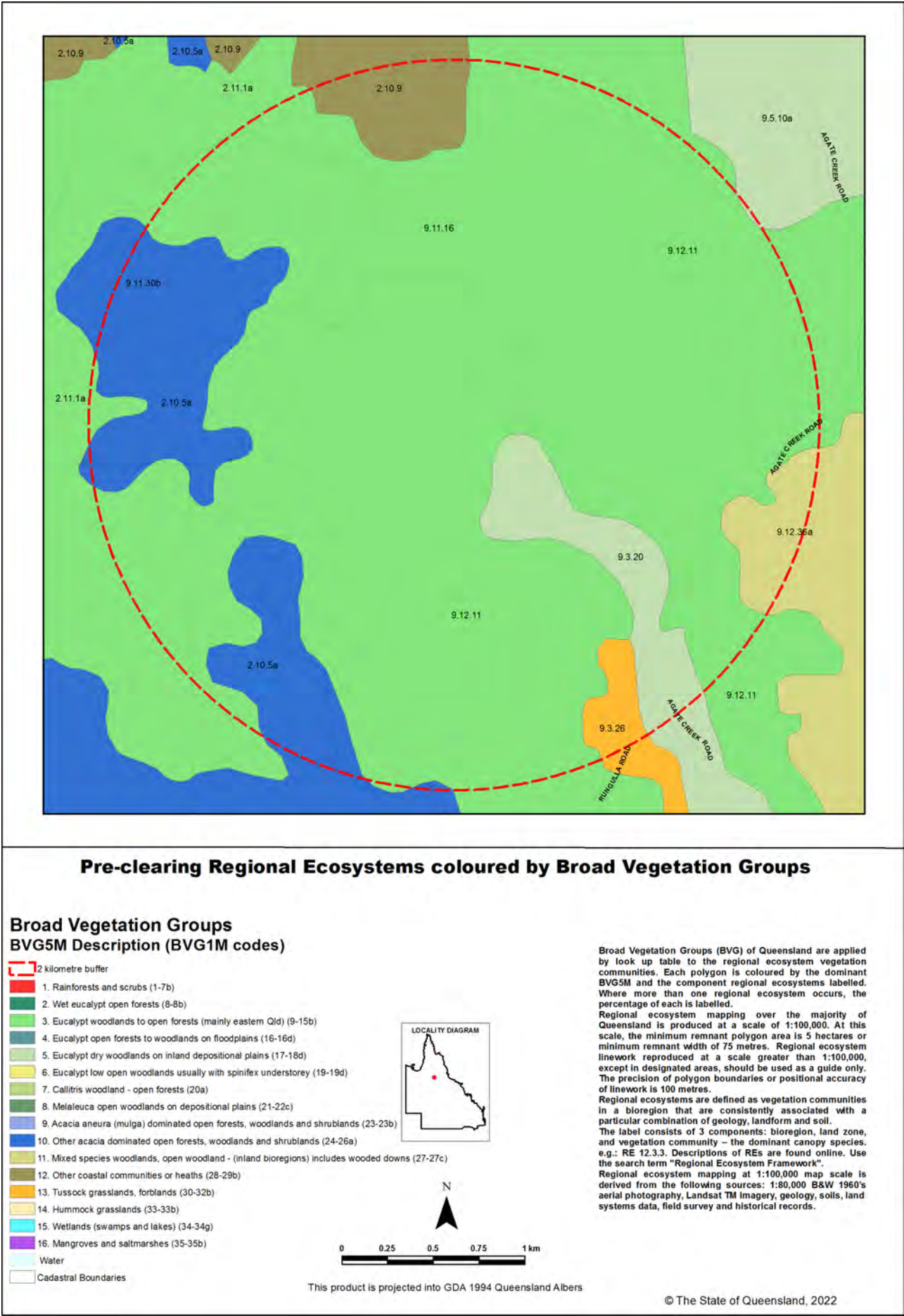
Map 3 - Pre-clearing regional ecosystems



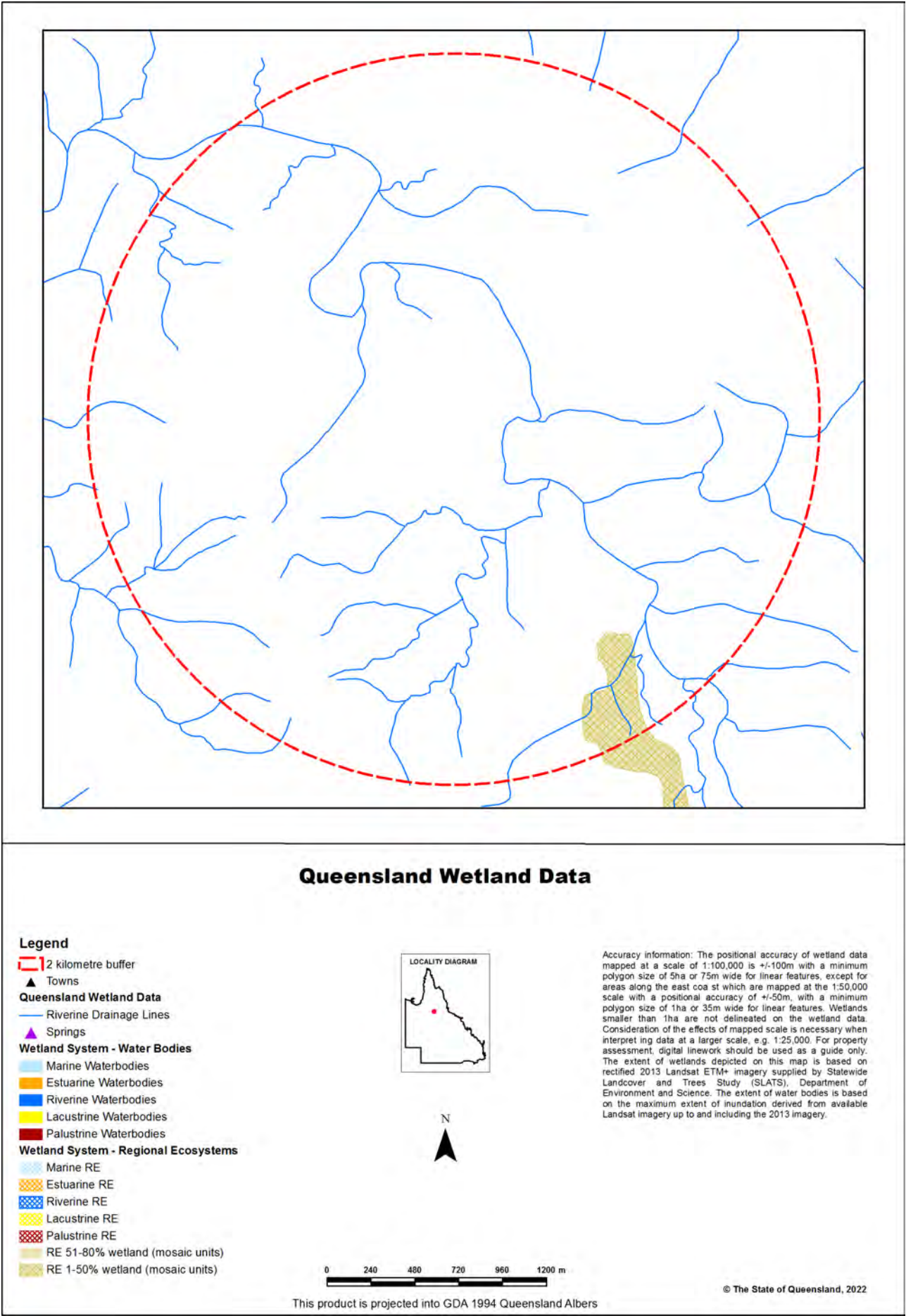
Map 4 - Remnant 2019 regional ecosystems by BVG (5M)



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



Map 6 - Wetlands and waterways



## Links and Other Information Sources

The Department of Environment and Science's Website -

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

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

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

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

The methodology for mapping regional ecosystems can be downloaded from:

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

Technical descriptions for regional ecosystems can be obtained from:

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

Benchmarks can be obtained from:

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

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

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

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

<http://www.dnrm.qld.gov.au/mapping-data/queensland-globe>

## References

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

## Appendices

### Appendix 1 - Source Data

The dataset listed below is available for download from:

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

- Regional Ecosystem Description Database

The datasets listed below are available for download from:

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

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

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## Appendix 2 - Acronyms and Abbreviations

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

## Appendix B – Fish Photos



Chequered Rainbowfish – *Melanotaenia splendida inornata*



Macleay's Glassfish – *Ambassis macleayi*



Spangled Perch – *Leiopotherapon unicolor*



Hyrthl's Tandan – *Neosilurus hyrtlai*