Australian Government

Defence

Environment and Heritage Assessment

Greenvale Training Area Initial Works

30 May 2023

PART 2 – APPENDICES

Revision 0

Appendices

Appendix A

Main Works project description

Appendix A
Greenvale Training Area Main Works Project Description

A-1 Overview

Greenvale Training Area is to be developed and operated by Defence within Defence owned land, covering approximately 310,000 ha south of Gregory Developmental Road (Figure A1). Built infrastructure to sustain personnel and support training are to be established within Greenvale Training Area, and wastewater pipeline and irrigation infrastructure are to be developed from the Charters Towers Regional Council operated Greenvale wastewater treatment plant to a new irrigation area at Greenvale airfield. The extent of Greenvale Training Area and the location of external infrastructure is provided in Figure A-1.

The Main Works component of the action includes construction of infrastructure and operation of Greenvale Training Area, including training and ongoing maintenance.

A-2 Infrastructure

A-2.1 Temporary construction camp

The temporary construction camp would provide accommodation and facilities to the temporary workforce to support the construction of Greenvale Training Area. It will be connected to the road and services networks including water, wastewater and power.

A-2.2 Road network

Greenvale Training Area will be accessed from Jessie Springs Road, which adjoins the Gregory Developmental Road near Greenvale. Jessie Springs Road extends from the north in a southerly direction and beyond the south-eastern boundary of Greenvale Training Area.

An internal road network will support administrative and training movements throughout Greenvale Training Area. This would include:

– Primary road network: the main access to the Greenvale Training Area consisting of the road length from Gregory Developmental Road to the Administration precinct.
– Secondary road network: the connection from the primary road network to training locations within the Greenvale Training Area. These will support the administrative movement of soldiers to training areas.
– Tertiary roads and track: the access and training tracks within training areas.

A-2.3 Water supply

Potable water will be supplied to Greenvale Training Area from the Council Greenvale reservoir and water treatment plant. A water supply pipeline will extend from the Greenvale Training Area boundary to the potable water plant at the Administration Precinct prior to being reticulated.

A-2.4 Wastewater management

A-2.4.1 Wastewater infrastructure within Greenvale Training Area

A wastewater pipeline would be established from the Administration and Entry Precincts to adjoin the pipeline established during the Initial Works along Jessie Springs Road.

A-2.4.2 Wastewater infrastructure external to Greenvale Training Area

A wastewater pipeline would be established from the Greenvale wastewater treatment plant (along Gregory Developmental Road) to Greenvale airport, primarily within the Gregory Developmental Road road reserve. An irrigation area would be established on land owned by Charters Towers Regional Council within the airfield. The irrigation area would be used to accommodate the increase in treated wastewater output from the Greenvale wastewater treatment plant as a result of the temporary additional generation of wastewater related to training activities. The irrigation area would be owned and operated by Council.

A-2.5 Power supply

Greenvale Training Area would be connected to the existing Ergon Energy network. Power supply will be a mix of above and underground installations and include new intake switching station.

A-2.6 Information communications and technology

Information communications and technology infrastructure would comprise underground fibre optic cables from the Greenvale Training Area boundary to locations throughout Greenvale Training Area.

A-2.7 Simulation infrastructure

Simulation infrastructure refers to communications towers located at elevated vantage points throughout the Greenvale Training Area. A cleared pad, access track and power supply would be established for each tower.

A-2.8 Firebreaks and fencing

Firebreaks would be constructed around areas with a higher risk of fire. Existing internal tracks, roads and creeks are utilised where available to provide additional internal firebreaks.

New fencing would be established along boundary facing fire breaks. This would typically consist of galvanised steel posts or star pickets joined by wire strands. Outside these alignments, existing fencing and warning signs will be used to demarcate the Greenvale Training Area boundary.

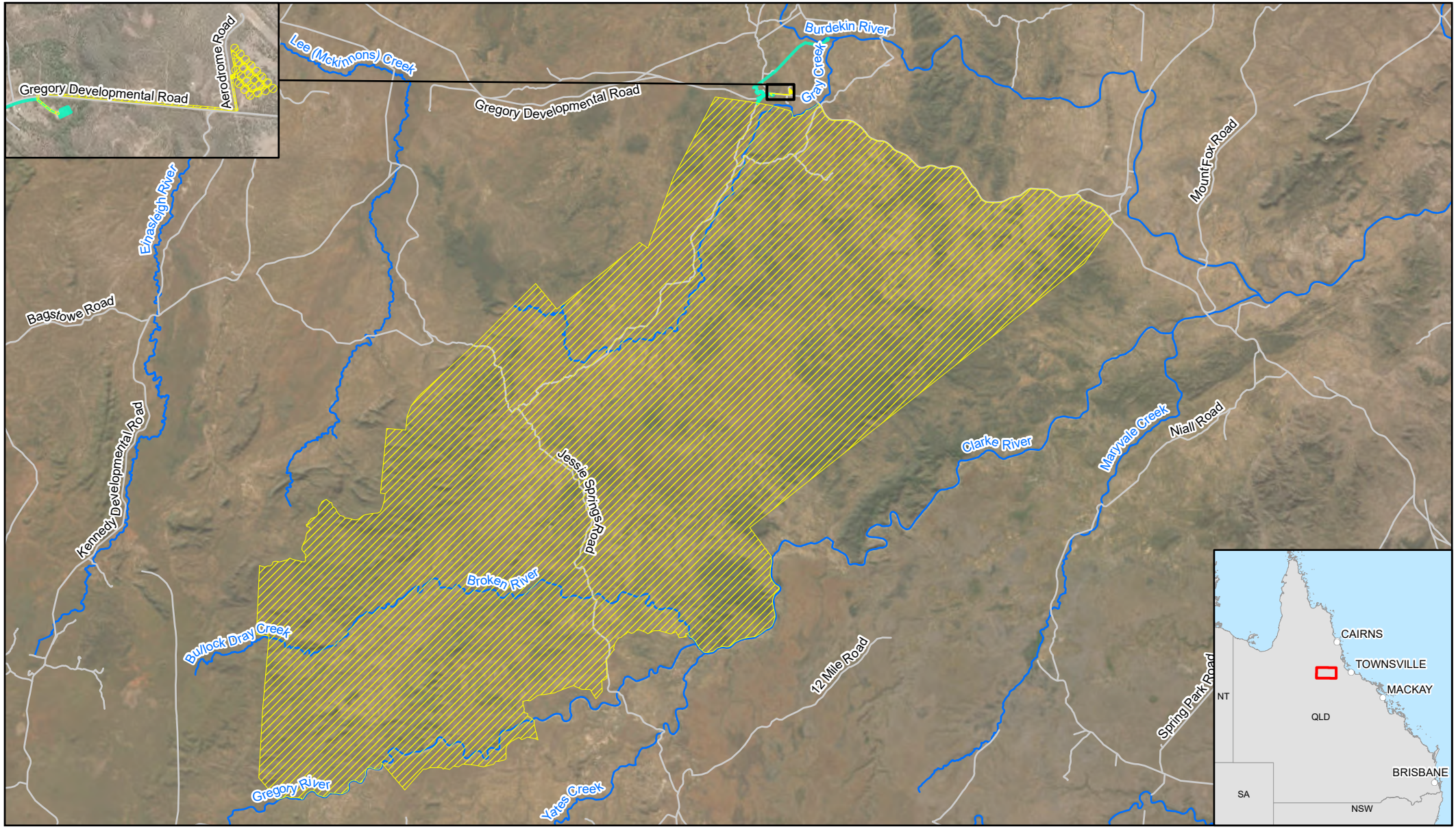
A-2.9 Built facilities

Built facilities are infrastructure that would provide accommodation, messing, administrative, medical and maintenance support across precincts within Greenvale Training Area. These include:

– Entry Precinct: command and control facilities as well as an automated vehicle deseeder, vehicle parking / waiting bays at the entry and exit from Greenvale Training Area.
– Administration Precinct: camp accommodation (dormitory and tents), mess hall and ablutions, exercise briefing/debriefing and control rooms, waste management facilities, medical facilities (including helicopter evacuation zone) storage, maintenance, refuelling and parking areas.

A-2.10 Training ranges

Training ranges, which aim to replicate an operational combat environment for personnel to develop and practice skills, are to be developed within Greenvale to support live firing, non-live (blank) firing, troop coordinated movements (manoeuvres) and vehicle and aircraft manoeuvres.



Legend

- Watercourses
- Roads
- Early Works
- Main Works

Paper Size ISO A4

0 5 10 15 20

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Department of Defence
ASMTI Greenvale Main Works

Project No. **12547012**
Revision No. **A**
Date **13 Mar 2023**

Greenvale Training Area overview

FIGURE A1

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Data source: GA Mainlands, Place Names (2007); DoR: Roads, Watercourses, Railway, Towns (2001); GHD: Early works referral (previous referral), Main works (this referral) (2022);World Imagery: Earthstar Geographics
World Imagery: Maxar.

A-3 Operations overview

A-3.1 Training activities

Land based and air-based training activities specific to the training range type would be conducted within training ranges established at Greenvale Training Area.

Mobilisation of personnel to a training area involves substantial planning and logistics for deployment of troops and management of the training activities. Generally, for the scale of training to be undertaken at Greenvale Training area, phases in the training process would include deployment, main exercise (involving a series of training activities leading to a 'culminating activity' which is typically a multi-service training activity), followed by re-deployment at the end of the activity.

Defence activities on training areas are undertaken in accordance with an overarching Defence environmental Strategy and Policy. Environmental management structures, including policies and procedures have been established by Defence to make sure that Defence can meet training and operational needs, training area sustainability objectives and statutory obligations during the conduct of activities. These policies and procedures apply to Australian Defence Force personnel as well as for forces of other countries visiting Australia.

A-3.2 Training area management

Ongoing management and maintenance regimes are to be established for Greenvale Training Area. The management and maintenance regimes would address Defence's obligations under the Defence Environment and Heritage Manual, and more broadly meet the requirements of the Defence Environmental Policy and sustainability framework, and statutory requirements under the *Environment Protection and Biodiversity Conservation Act 1999*.

Defence is planning to establish an Environmental Management Group to oversee major field training activities at Greenvale Training Area.

Appendix B

Biodiversity Values Report

Australian Government

Defence

Biodiversity Values Report

Initial Works

30 May 2023

Revision 0

Executive Summary

This Biodiversity Values report presents the findings of desktop and field surveys undertaken to assess the ecological values occurring within the Initial Works footprint.

The Initial Works project incorporates works that will replace aging water supply and wastewater and communications infrastructure that supports the township of Greenvale, as well as intersection improvements for safety purposes. These ancillary works are necessary for the construction and operation of Greenvale Training Area.

The desktop assessment reported the presence of several ecological values within the Initial Works footprint, including, remnant native vegetation and conservation significant flora and fauna. Biodiversity characteristics of the Initial Works footprint were identified from an ecological field survey.

No conservation significant species were confirmed present within the Initial Works footprint. Based upon species records and habitats, five listed threatened species and two listed migratory species were assessed to be likely to occur, while seven listed threatened species and four listed migratory species were assessed as 'may occur' species within the Initial Works footprint.

Table E-1 Summary of conservation significant species confirmed present, assessed as likely to occur, or may occur within the Initial Works footprint

Common name	Scientific name	Conservation status		Likelihood of Occurrence
		EPBC Act	NC Act	
Matters of National Environmental Significance				
Fauna				
Red goshawk	*Erythrotriorchis radiatus*	E	E	Likely to occur
Greater glider (northern)	*Petauroides minor*	E	E	Likely to occur
Koala	*Phascolarctos cinereus*	E	E	Likely to occur
Black-throated finch (southern)	*Poephila cincta cincta*	E	E	Likely to occur
Squatter pigeon (southern)	*Geophaps scripta scripta*	V	V	Likely to occur
Northern quoll	*Dasyurus hallucatus*	E	SL	May occur
Gouldian finch	*Erythrura gouldiae*	E	E	May occur
Yakka skink	*Egernia rugosa*	V	V	May occur
Grey falcon	*Falco hypoleucos*	V	V	May occur
Greater large-eared horseshoe bat	*Rhinolophus robertsi*	V	E	May occur
Bare-rumped sheath-tailed bat	*Saccolaimus saccolaimus nudicluniatus*	V	E	May occur
Masked owl (northern)	*Tyto novaehollandiae kimberli*	V	V	May occur
Migratory fauna				
Fork-tailed swift	*Apus pacificus*	Mig	SL	Likely to occur
Satin flycatcher	*Myiagra cyanoleuca*	Mig	SL	Likely to occur
Oriental Cuckoo	*Cuculus optatus*	Mig	SL	May occur
Grey Wagtail	*Motacilla cinerea*	Mig	SL	May occur
Common greenshank	*Tringa nebularia*	Mig	SL	May occur
Key to table: E = Endangered, V = Vulnerable, Mig = Migratory, SL – Species least concern, NL = Not listed.				

Abbreviations

Abbreviation	Definition
ALA	Atlas of Living Australia
ASMTI	Australia-Singapore Military Training Initiative
Biosecurity Act	*Biosecurity Act 2014*
BoM	Bureau of Meteorology
BTF	Black-throated finch (southern)
CE	Critically endangered
CTRC	Charters Towers Regional Council
DAF	Department of Agriculture and Fisheries
DCCEEW	Department of Climate Change, Energy, the Environment and Water
Defence	Department of Defence
DES	Department of Environment and Science
DIWA	Directory of Important Wetlands of Australia
DoR	Department of Resources
E	Endangered
EAs	Environmental Authorities
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GDE	Groundwater Dependent Ecosystems
GPS	Global Positioning System
GVTA	Greenvale Training Area
ha	hectare
HES	High Ecological Significance
LC	Least concern
m	metre
Mar	Marine
Mig	Migratory
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC	No concern at present
NC Act	*Nature Conservation Act 1992*
OC	Of concern
PMST	Protected Matters Search Tool
RE	Regional ecosystem
SARA	State Assessment and Referral Agency
SAT	Spot Assessment Technique
SL	Special least concern
SMP	Species Management Program
SPRAT	Species Profile and Threats Database

Abbreviation	Definition
TECs	Threatened Ecological Communities
V	Vulnerable
VM Act	*Vegetation Management Act 1999*
WO	Wildlife Online
WoNS	Weeds of National Significance
WPA	Wetland Protection Area
WWBW	Waterway Barrier Works

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1. Introduction

1.1 Background

In 2015, the Australian and Singapore Governments entered a joint partnership known as The Comprehensive Strategic Partnership, which agreed to increase the Singapore Armed Forces access to Australian military training areas. The Australian Government and the Government of the Republic of Singapore Government ratified the Treaty concerning Military Training and Training Area Development in Australia on 10 December 2020.

The Department of Defence (Defence) identified that additional training facilities will be necessary to support the Australia-Singapore Military Training Initiative (ASMTI), and in 2017 commenced a process to identify potentially suitable locations. Following a feasibility assessment, Defence acquired a number of properties with an area of approximately 310,000 ha in the vicinity of Greenvale, North Queensland, for the purpose of establishing a new military training area known as the Greenvale Training Area (GVTA).

The project generally includes the upgrade or development of new facilities and infrastructure to establish the GVTA, as well as the long-term operation of the training area including, training and maintenance activities.

This document pertains to the ecological values of the Initial Works project as described below.

1.2 Project overview

The Initial Works project will replace the aging water supply infrastructure as well as upgrade wastewater and communications infrastructure that supports the township of Greenvale. It will also include intersection improvements for safety purposes. These ancillary upgrades are necessary for the construction and operation of the GVTA.

The Initial Works includes construction, operation and maintenance of:

– New water extraction infrastructure from the Burdekin River for the purposes of water supply to the reservoir.
– Upgrade of the Greenvale reservoir and water treatment plant to provide potable water to Greenvale and GVTA.
– Upgrade of the Greenvale wastewater treatment system to service Greenvale and GVTA.
– Installation of water supply and wastewater pipelines connecting the Greenvale reservoir and water treatment plant and Greenvale wastewater treatment plant to the boundary of the GVTA.
– Road and intersection upgrades along the access to GVTA.
– Upgrade of telecommunications infrastructure in Greenvale.

The infrastructure is generally to be sited alongside existing infrastructure (i.e. pipelines, intersection upgrade), or involve upgrades to degraded infrastructure or expansions to infrastructure within existing footprints of extraction and treatment facilities.

The Main Works project (reported separately) entails works required to support construction and operation of the military training activities within the GVTA. The Main Work project footprint is predominantly located within the GVTA boundary, however also includes the construction, operation and maintenance of a treated wastewater pipeline and irrigation area outside of GVTA to support the increased demand on the wastewater treatment plant resulting from the GVTA.

Only the ecological values relevant to the Initial Works are discussed in this document.

1.3 Purpose of this report

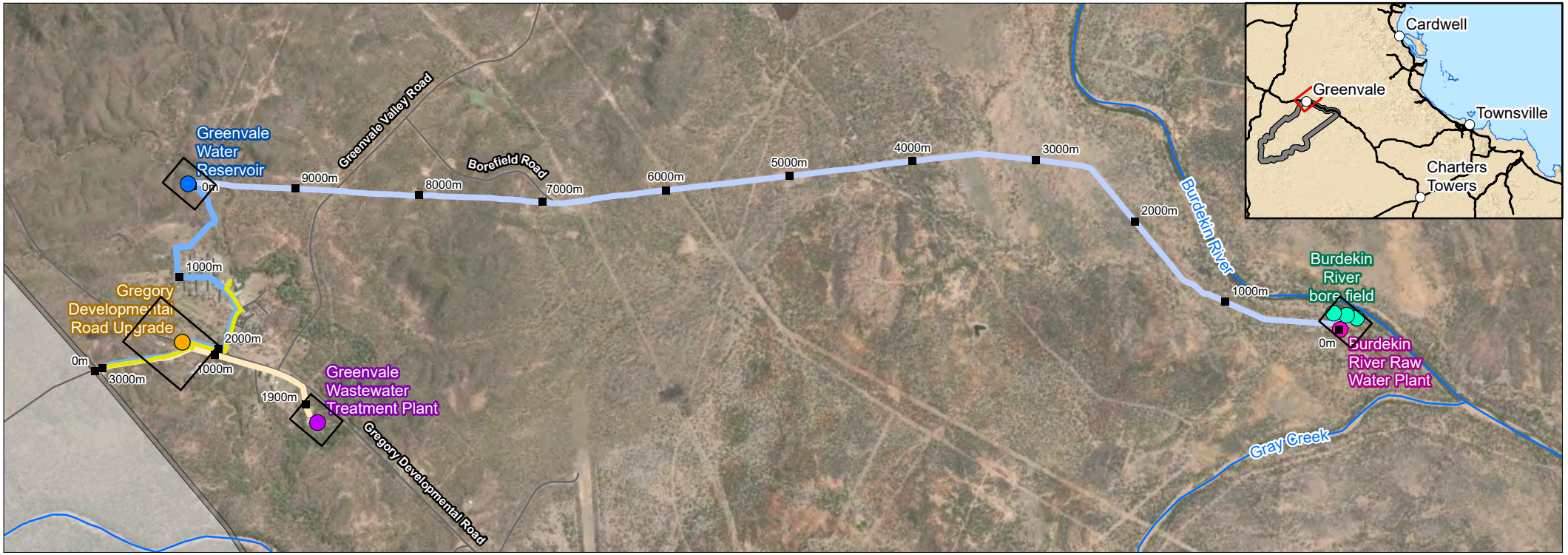
The purpose of this Biodiversity Values report is to provide a consolidated summary of the ecological values within the Initial Works as described in Section 1.2. This report is to support referral 1 for the Initial Works phase of the Project, which is an integral part of a two phase split referral process to support the establishment of GVTA.

1.4 Definitions

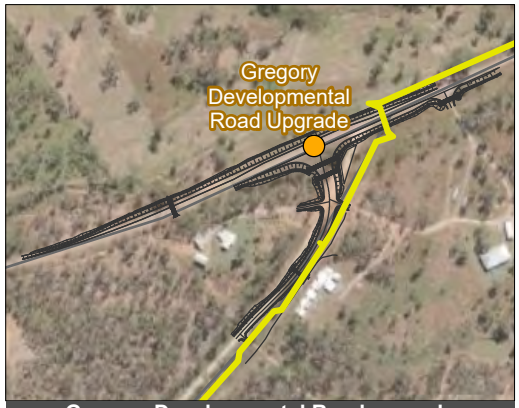
Definitions used within this document are included in Table 2.

Table 2 Project definitions

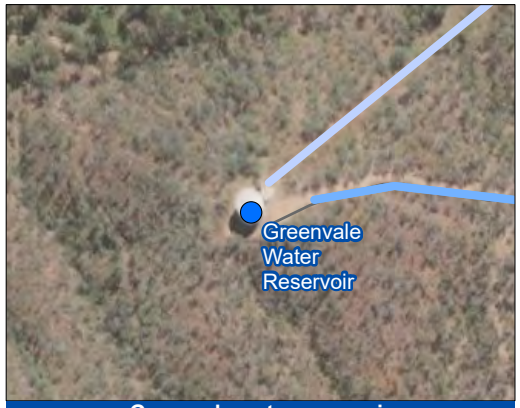
Name	Definition
Initial Works / Initial Works footprint	The Initial Works footprint includes the water extraction infrastructure on the Burdekin River, the Greenvale reservoir and water treatment plant, water supply and wastewater pipelines from the Greenvale reservoir and water treatment plant and Greenvale wastewater treatment plant to the boundary of the GVTA; road and intersection upgrades along the access to the GVTA and telecommunication infrastructure upgrades as shown in Figure 1
Study area	The Study area represents the extent of the desktop assessment, which encompassed the Initial Works footprint plus a 1 km and 10 km buffers. A wider search area was adopted for the desktop assessment to identify ecological values of the surrounding landscape.
Conservation significant species	Species listed as critically endangered, endangered, vulnerable or migratory under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or listed as critically endangered, endangered or vulnerableunder the Queensland *Nature Conservation Act 1992* (NC Act).
Pest flora species	Pest flora represent species listed as Weeds of National Significance (WoNS) under the National Weeds Strategy or listed as prohibited or restricted matter under the *Biosecurity Act 2014* (Biosecurity Act).
Pest fauna species	Pest fauna listed as key threatening processes to conservation significant species under the EPBC Act or as prohibited or restricted matter under the Biosecurity Act.



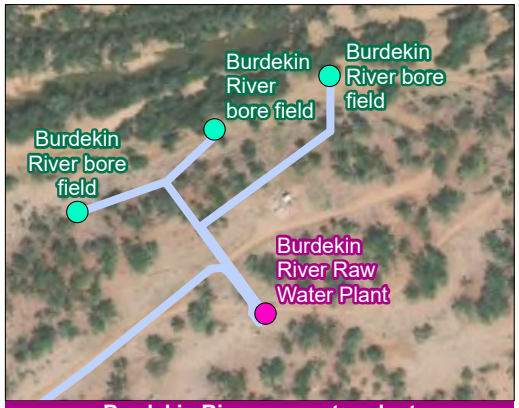
Wastewater treatment plant



Gregory Developmental Road upgrade



Greenvale water reservoir



Burdekin River raw water plant

Legend

- Burdekin Raw Water Plant
- CTRC Burdekin River water supply bore field
- Greenvale Wastewater Treatment Plant
- Greenvale Water Reservoir
- Gregory Developmental Road Upgrade
- 1km marker
- Sewer rising main
- Raw Water
- Raw Water Treated
- Greenvale telecommunications infrastructure upgrade
- Greenvale Training Area

Paper Size ISO A4

0 0.5 1 1.5 2

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Department of Defence
ASMTI Greenvale Initial Works

Project locality

Project No. **12547012**
Revision No. **1**
Date **09 Mar 2023**

FIGURE 1

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Print date: 09 Mar 2023 - 15:56

Data source: GHD: Site Layout (2023), DoR: Roads, Waterways (2022), World Imagery: Maxar.

2. Statutory framework

2.1 Commonwealth legislation

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally significant flora, fauna, ecological communities, together with heritage places which are defined in the EPBC Act as Matters of National Environmental Significance (MNES). The EPBC Act is administered by the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

The EPBC Act includes approved lists of species and communities. Relevant lists that relate to biodiversity include:

– Listed threatened ecological communities.
– Threatened flora.
– Threatened fauna.
– Migratory species.
– Marine species.

MNES under the EPBC Act include:

– Critically endangered and endangered listed threatened ecological communities (TECs).
– Critically endangered, endangered and vulnerable threatened flora and fauna.
– Migratory species.

2.2 State legislation

Defence aims to comply with the intent of State legislation and local government laws, to the extent that these provisions are not inconsistent with Commonwealth requirements. A summary of relevant Queensland Government, and Charters Towers Regional Council (CTRC) environment and planning controls is provided in Table 3 with a brief description on context as it may relate to the Initial Works.

Table 3 Relevant state legislation

Legislation, policy or control	Administering authority	Context and relevance
State government		
Vegetation Management Act 1999 (VM Act)	Department of Resources (DoR) State Assessment and Referral Agency (SARA)	The *Vegetation Management Act 1999* regulates the clearing of vegetation in Queensland in a way that conserves remnant vegetation and interacts with the Planning Act and Planning Regulation 2017 to regulate development that involves clearing of vegetation. Vegetation is defined under the *Vegetation Management Act 1999* as a native tree or plant other than grass or non-woody herbage, plants within grassland regional ecosystems prescribed under a regulation, or mangroves. Operational work that involves clearing vegetation is prohibited unless it meets one of the following: – The work is for a 'relevant purpose' under section 22A of the *Vegetation Management Act 1999*. – The work is exempt clearing work under schedule 21 of the Planning Regulation 2017. – The work is accepted development under schedule 7, part 3, section 12 of the *Planning Act 2016*. The Initial Works would require clearing of vegetation mapped as regulated vegetation under the *Vegetation Management Act 1999*. Vegetation clearing that is undertaken for the construction and/or upgrade of roads in the Initial Works is exempt clearing under

Legislation, policy or control	Administering authority	Context and relevance
		schedule 21, part 1, 1(14)(b) of the Planning Regulation 2017 as the works are for the construction or maintenance of government supported transport infrastructure. Vegetation clearing undertaken for the construction of pipelines and other infrastructure associated with water supply and wastewater treatment will not be an exempt action but is likely to be carried out in compliance with the accepted development vegetation clearing code: clearing for infrastructure. If clearing cannot be undertaken in accordance with the accepted development clearing code, it would be assessable development and would require a development application for clearing native vegetation under the *Planning Act 2016*. Assessable development requires the work to be accepted as a 'relevant purpose'.
Biosecurity Act Biosecurity Regulation 2016	Department of Agriculture and Fisheries (DAF)	Relates to comprehensive biosecurity measures to safeguard the economy, agricultural and tourism industries, environment and way of life from pests, diseases and contaminants. Mechanism for "general biosecurity obligation" and focuses on biosecurity risks that are, or are likely to become, a significant problem for human health, social amenity, the economy or the environment. Biosecurity matter includes prohibited matter and restricted matter. Prohibited matter is matter that does not currently occur in Queensland and if it is found or believed this matter exists, it must be reported immediately. Restricted matter is found in Queensland however, action should be taken to limit its impact by reducing, controlling or containing it. Legislation will be applicable to GVTA access and exit which is located south of the Initial Works footprint.
NC Act	Department of Environment and Science (DES)	The NC Act aims to conserve nature while allowing for the involvement of Indigenous people in the management of protected areas in Queensland. It provides for the dedication of a range of protected areas including national parks (including national parks that are Aboriginal land), conservation parks, resources reserves, special wildlife reserves, nature refuges and coordinated conservation areas. It also provides for the listing of protected wildlife and sets restrictions on taking or otherwise interfering with that wildlife. It provides for the making of management plans and conservation plans concerning protected areas and protected wildlife. Under the NC Act, a Species Management Program (SMP) is required if an activity is proposed that may tamper with an animal breeding place, as defined under section 335 of the Nature Conservation (Animals) Regulation 2020. SMPs can be either low risk or high risk, depending on the conservation status of the animal. SMPs do not apply to the koala (*Phascolarctos cinereus*), as koalas do not use habitual breeding places (e.g., a nest or tree hollow). Impacts to koalas are managed under the *Nature Conservation (Koala) Conservation Plan 2017*. Similarly, SMPs do not apply to flying-fox roosts as they are dealt with separately under section 88C of the NC Act and section 61 of *the Nature Conservation (Animals) Regulation 2020.* An ecology field survey is required to be undertaken to determine the presence of any animal breeding places for which an SMP would be required prior to construction.

Legislation, policy or control	Administering authority	Context and relevance
Local Government		
Biosecurity Plan 2019-2024	CTRC	Mechanism for management of invasive plants and animals within the CTRC Local Government Area. Includes strategy for the roles and responsibilities of all stakeholders in relation to the control of invasive species on their land. Defence has a number of responsibilities outlined under the Biosecurity Plan that must be followed including: – Eradicate or contain and prevent the spread of invasive plants and animals on land under their control in accordance with the Charters Towers Regional Council Biosecurity Plan and relevant legislation. – Implement weed hygiene protocols to prevent weed seed spread. – Implement monitoring program to ensure new incursions are detected and eradicated. – Implement guidelines and protocols for grazing on Australian Defence Force land. – Provide support for planned surveillance activities. Land managers (public and private) must adhere to the following responsibilities: – Follow best practice for invasive plant and animal management on land they have responsibility for in line with relevant legislation, policy, guidelines, pest management plans and codes of practice. – Be aware of and embrace Council's Biosecurity Plan 2019-24

3. Methodology

3.1 Desktop review

A desktop literature and database review has been undertaken to identify threatened flora and fauna species, populations and ecological communities (including threatened biota) as listed under the EPBC Act that could be expected to occur in the locality. The searches revealed species that are expected to occur in the locality based on previous sighting records, known distribution ranges and the localised habitats present. Biodiversity databases and existing literature and information pertaining to the Study area and locality indicated in Table 4, were reviewed prior to conducting field investigations. The desktop assessments results containing the threatened biota and migratory species as identified are included in Appendix A of this Biodiversity Values Report.

Following collation of database records and species and communities' profiles, a 'likelihood of occurrence' assessment was prepared with reference to the broad habitats at the Initial Works footprint. This was further refined following field surveys and assessment of habitats present.

The desktop searches were conducted in December 2022.

Table 4 Desktop review resources

Resource	Summary
Commonwealth	
DCCEEW EPBC Protected Matters Search Tool (PMST)	MNES and other protected matters listed under the EPBC Act located within the Study area (i.e. a 1 km and 10 km radius of the Initial Works footprint).
DCCEEW Species Profile and Threats Database (SPRAT)	Species profiles were assessed to determine habitat requirements and ecology of potentially occurring conservation significant species.
DCCEEW Directory of Important Wetlands of Australia (DIWA)	The DIWA database was searched to understand if any nationally important wetlands are present within the Study area.
State	
Queensland Government, Department of Environment and Science, Environmental Reports portal – Regional Ecosystems (RE)	A report generated for the Initial Works footprint providing information on the type, status and extent of vegetation communities, REs and broad vegetation groups present.
Queensland Government, Department of Environment and Science, Environmental Reports portal – Regulated Vegetation	A report generated for the Initial Works footprint providing information on vegetation categories for determining relevant assessment categories.
Queensland Government, Department of Environment and Science, Environmental Reports portal – Modelled Potential Habitat	A report generated for the Initial Works footprint providing information on species modelled to have potential habitat on the pre-clearance zone for threatened fauna and flora species.
Queensland Government, Department of Environment and Science, Environmental Reports portal – WildNet Records Conservation Significant Species List	A report providing information on conservation significant species that have been historically recorded within the Study area.
Queensland Government, Department of Environment and Science, Environmental Reports portal – WildNet Records Pest List	A report providing information on pest flora and fauna species identified within the Study area
Queensland Government, Department of Environment and Science, Environmental Reports portal – WildNet Records Weeds List	A report providing information on pest flora species identified within the Study area
Queensland Government, Department of Environment and Science, Wetland Info – Wetlands Mapping Report	A report providing information on wetland values within the Initial Works footprint.

Resource	Summary
Queensland Government, Department of Environment and Science, Wetland Info – Aquatic Ecosystem Rehabilitation Mapping Report	A report providing information to assist with the development of an aquatic ecosystem rehabilitation plan and the values that exist within the Initial Works footprint.
Queensland Government, Department of Environment and Science, Environmental Authority Search	A report generated for the Environmental Authorities (EAs) that exist within the Initial Works footprint.
Public	
Atlas of Living Australia (ALA) Database	The ALA database was searched to retrieve historical records of conservation significant flora and fauna species assessed as likely to occur within and near the Initial Works footprint.
Queensland Government, DoR's Queensland Globe	The Queensland Globe was consulted for mapping overlays to identify a variety of environmental values in proximity to the Initial Works footprint.

3.2 Field survey scope justification

As discussed in Section 1.2, this Initial Works application is an integral component of a two phase split referral to support the establishment of GVTA. The Main Works footprint incorporates an area (mapped as Lot 54 on SP319944) which is approximately 310,000 ha, together with an associated Greenvale Wastewater Irrigation Area.

A suite of baseline surveys has been conducted for the GVTA. In total, 16 ecological surveys (a total of 13 weeks) have been conducted within the GVTA to identify environmental values across a variety of seasons. This has included five targeted surveys, three surveys targeting specific works elements, one aquatic survey and one two-week baseline survey. The northern boundary of the GVTA is 720 m south from the Gregory Developmental Road intersection which will be upgraded as part of the Initial Works. Given the close proximity of the Main Works to the Initial Works areas, both areas would exhibit similar conditions.

The Initial Works area is a less significant footprint and is generally sited in areas predominately disturbed, which includes installation with existing pipeline infrastructure or within road corridors. Given the comparison in footprint size, the Initial Works alignment has been entirely surveyed over a two day period.

3.3 Field survey

3.3.1 Survey conditions

An ecological field survey of the Initial Works footprint was undertaken over three days between December 12 and 14, 2022. The weather was generally fine and sunny throughout the survey. However, a thunderstorm occurred on the late afternoon/the early evening of December 13. Rainfall data was captured at a radar located at Lucky Springs Station which is located 6 km south of from the Greenvale township (radar number 30115) and recorded total precipitation of 11 mm during the survey period (BoM, 2022b).

According to the Townsville – Air Weapons Range (Defence) (radar number 032196) which is approximately 136 km from Greenvale, recorded maximum temperatures on the 12, 13 and 14 of December were 33.6 °C, 34.5 °C and 39.0 °C respectively (BoM, 2022a).

3.3.2 Field survey effort

Three ecologists and one environmental scientist conducted the surveys of the Initial Works footprint over the three days. A summary of the field survey effort is presented in Table 5 and presented in Figure 2.

Table 5 Survey effort

Dates	Survey extent	Survey effort
12 December 2022	– Greenvale wastewater system upgrade. – Gregory Developmental Road intersection and Jessie Springs Road upgrade to GVTA boundary.	– Breeding place assessment (includes hollow count and active search of logs/log piles) – 191. – Fauna habitat assessment – 35. – Spot Assessment Technique (SAT) search – 26. – Quaternary assessment – 39. – Aquatic/crocodile habitat assessment – 1. – Photo point – 132.
13 December 2022	– Burdekin River water extraction facility. – Greenvale water supply upgrade.	
14 December 2022	– Greenvale water supply upgrade. – Greenvale wastewater system upgrade. – Gregory Developmental Road intersection and Jessie Springs Road upgrade to GVTA boundary.	

3.3.3 Flora survey methods

The field survey included a combination of vegetation community assessments and targeted survey effort for conservation significant species as shown in Figure 2 and Figure 5. Due to the small Initial Works footprint, the entire vegetated area was surveyed. Survey effort was predominantly targeted towards areas deemed to be of ecological significance based on a review of desktop sources, with little time dedicated to disturbed areas. The flora survey methodology is provided in Table 6.

Table 6 Flora field survey methods

Survey technique	Detailed survey methodology
Vegetation assessments	Vegetation mapping was undertaken using the Queensland Government RE mapping framework, field-verifying existing DoR (version 12.2) RE mapping through on-ground vegetation assessments. Verification of RE mapping was undertaken at 39 sites, using a combination of quaternary level vegetation assessments and informal observations (as described in *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland – Version 6* (Neldner et. al, 2022). This methodology, despite being a state methodology, is a useful tool to structure flora surveys in a consistent manner that can be repeated. It also can be used to quantify fauna habitat and directly translates to vegetation community assessments described below. At each quaternary site, data and observations were collected on the structural and floristic composition of vegetation communities to determine the RE type. Data collected included dominant species, and vegetation structure (estimation of height and cover) of the ecological dominant layer. Information on geology and landscape attributes was also collected. Some discrepancies in RE boundaries were also noted. Quaternary assessment points are shown in Figure 2.
Vegetation community assessments	Vegetation communities were field verified at 39 locations and mapped across the Initial Works footprint. The vegetation communities were mapped at a finer scale than the field verified RE mapping described. This is because the vegetation communities mapping is not restricted by the minimum patch size requirements as RE mapping is due to the requirements described in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland – Version 6* (Neldner et. al, 2022).
Searches for conservation significant flora species	The Initial Works footprint is not mapped within a high-risk flora trigger area on the State's Protected Plants Flora Survey Trigger Mapping. However, random meander methods as prescribed in the *Flora Survey Guidelines – Protected Plants 2014* were completed to survey for conservation significant flora species within vegetated areas. Of note, the survey was confined to 10 m either side of the Initial Works footprint within vegetated areas.
Biosecurity matters	Prohibited or restricted invasive species as defined under the Biosecurity Act were recorded where observed. The surveys recorded estimated densities and extent of presence of biosecurity matters observed in the Initial Works footprint.

3.3.4 Fauna survey methods

The field fauna survey was undertaken over three days and included a suite of rapid survey methods including habitat assessments, targeted searches for wildlife breeding places, bird census surveys, active searches for reptiles and amphibians, targeted searches for koala faecal pellets using the SAT and targeted searches for secondary wildlife traces. Information on the survey methods is described in more detail in Table 7. Due to the small Initial Works footprint, the entire area was surveyed. Survey effort was predominantly targeted towards areas deemed to be of ecological significance based on a review of desktop sources, with little time dedicated to disturbed areas.

Fauna survey methods are detailed in Table 7 below.

Table 7 Fauna field survey techniques

Survey technique	Detailed survey methodology
Habitat assessments	Habitat assessments were undertaken at 35 survey sites. Throughout the rapid survey, the value of habitats for terrestrial fauna was assessed based on the presence of key resources and microhabitats – as determined by the structural complexity of vegetation and the presence of features such as tree hollows, burrows, rocky outcrops, caves, leaf litter and woody debris. Key habitat features important for conservation significant species were recorded. Broad fauna habitat types were defined and mapped throughout the Initial Works footprint based on field verified RE mapping, habitat assessments, DoR essential habitat, and aerial imagery. The habitat types were validated, and mapping refined, through the ecological field surveys.
Searches for terrestrial conservation significant fauna species	Active searches for conservation significant fauna species were undertaken at within the Initial Works footprint using random meander searches, and targeted searches in potential habitat for conservation significant fauna likely to occur within the Initial Works footprint. The field assessment utilised the following methods: – SAT searches (Phillips & Callaghan, 2011) together with visual searches for target species such as koala, greater glider (northern) (26 sites). – Active searches for reptiles and amphibians (opportunistically). – Opportunistic visual and aural surveys (Loyn, 1986). – Flushing surveys for squatter pigeon (southern) (*Geophaps scripta scripta*) (opportunistically). All incidental records of conservation fauna observed during surveys were recorded including bones, feathers, skulls, sloughed skins, faecal pellets, tracks, burrows, scratches, distinctive feeding signs and other indirect wildlife traces. Potential breeding places were recorded when intersecting or adjacent to the infrastructure (191 sites). The description of the breeding place and Global Positioning System (GPS) coordinates were included per site. Fauna search type points and incidental records are shown in Figure 2.

3.3.5 `Aquatic survey methods

The aquatic field survey was limited to where the Burdekin River water extraction facility is located along the Burdekin River.

Aquatic survey techniques utilised during the field survey are presented in Table 8 below.

Table 8 Aquatic field survey techniques

Survey technique	Detailed survey methodology
Aquatic habitat and watercourse assessment	A rapid aquatic habitat assessment was conducted on the Burdekin River in accordance with the Queensland AusRivAS Sampling and Processing Manual (DNRME, 2011) and the DES Monitoring and Sampling Manual 2009 (DES, 2018). Photographs of the Initial Works footprint were taken as an additional record of habitat conditions at the time of the monitoring event. Information collected included: – channel type (braided, anabranching etc.). – habitat diversity and extent. – bed and bank composition. – hydrological attributes. – macrophytes. – suitability for aquatic fauna groups (including threatened species). – sensitivity to change. – existing disturbances/modifications or barriers and riparian condition. Habitat variable scores were summed to give a total score out of 135. A condition rating of 'Excellent', 'Good', 'Fair' or 'Poor' was then applied based on the total bioassessment scores identified in Table 9. The results of the habitat assessment were used to inform the suitability of the Initial Works footprint for potential conservation significant species. Aquatic habitat assessment and field survey points are shown in Figure 2.

Table 9 AusRIVAS riverine habitat assessment variables and categories

Habitat variable	Poor	Fair	Good	Excellent
Bottom substrate	0 - 5	6 - 10	11 - 15	16 - 20
Embeddedness	0 - 5	6 - 10	11 - 15	16 - 20
Velocity and depth category	0 - 5	6 - 10	11 - 15	16 - 20
Channel alteration	0 - 3	4 - 7	8 - 11	12 - 15
Bottom scouring and deposition	0 - 3	4 - 7	8 - 11	12 - 15
Pool/riffle, run/bend ratio	0 - 3	4 - 7	8 - 11	12 - 15
Bank stability	0 - 2	3 - 5	6 - 8	9 - 10
Bank vegetative stability	0 - 2	3 - 5	6 - 8	9 - 10
Streamside cover	0 - 2	3 - 5	6 - 8	9 - 10
Total	**0 - 38**	**39 - 74**	**75 - 110**	**111 - 135**

3.4 Compliance with survey guidelines

Targeted efforts during the field survey for EPBC-listed species was conducted in accordance with the Commonwealth survey guidelines and recommended methodologies. A summary of the survey requirements for EPBC-listed species targeted during field survey of the Initial Works footprint is presented in Table 10.

Table 10 Compliance with survey guidelines and recommended survey effort for EPBC-listed species

Species	Related guidelines	Survey effort	
		Recommended	Conducted
Koala	Survey guidelines for Australia's threatened mammals (DCCEEW, 2022i).	No specific survey requirements.	26 active SAT searches 35 fauna habitat assessments
Greater glider (northern)	Survey guidelines for Australia's threatened mammals (DCCEEW, 2022i).	Spotlighting transects Transects for tree hollows to identify habitat.	26 active SAT searches 175 hollow-bearing tree assessments
Black-throated finch (southern)	Survey guidelines for Australia's threatened birds (DEWHA, 2010). Significant Impact Guidelines for the Black-throated finch (southern) (DEWHA, 2009).	2 ha active searches for nests. Morning and afternoon waterbody watches (minimum 12 hrs) Surveys conducted during multiple seasons.	35 fauna habitat assessments 39 quaternary assessments including groundcover assessments
Squatter pigeon (southern)	Survey guidelines for Australia's threatened birds (DEWHA, 2010).	Area searches or transect surveys in areas of the species habitat. Flushing surveys also likely to be useful.	Active searches conducted during fauna habitat assessments (n = 35).
Red goshawk	Survey guidelines for Australia's threatened birds (DEWHA, 2010).	Search for nests within patches of tall forest. Active searches along riverbanks. Minimum 80 hrs searching.	Riverbanks surveyed within the Initial Works footprint.

3.5 Likelihood of occurrence

An assessment was conducted to attribute a 'likelihood of occurrence' to conservation significant species that have been previously recorded or were predicted to occur based on information obtained from the desktop searches and field survey. The desktop search methods are provided in Section 3.1. The likelihood of occurrence assessment was based on a review of species distributions and habitat requirements, historical records for the region, and the results of habitat assessments and field surveys. The likelihood of occurrence ranking is based on the framework presented in Table 11.

Results of the full likelihood of occurrence assessment is presented in Appendix B of this Biodiversity Values Report and summarised in Section 5.

Table 11 Likelihood of occurrence assessment criteria

Category	Criteria
Confirmed present	Species recorded during the field survey.
Likely to occur	Species has been recorded within or adjacent to the Initial Works project area based upon desktop review. Species habitat was confirmed present in the Initial Works project area based upon field surveys and/or desktop assessment.
May occur	The species has not been recorded in the Initial Works project area based upon desktop review and field surveys. Species distribution incorporates the Initial Works project area. Species habitat is present in the Initial Works project area based upon field surveys and/or desktop assessment.
Unlikely to occur	The species has not been recorded in the Initial Works project area based upon desktop review and field surveys. The Initial Works project area is outside of the species documented distribution. Species habitat is not present in the Initial Works project area.

*Flora species: As flora species cannot readily traverse in or out of assessment areas, likelihoods of presence can be downgraded significantly after field surveys if they are not observed. This is particularly true for conspicuous species (which may only be identified through their vegetative features such as flower and/or fruit) and if the survey effort traverses most, if not all of the area subject to field survey.

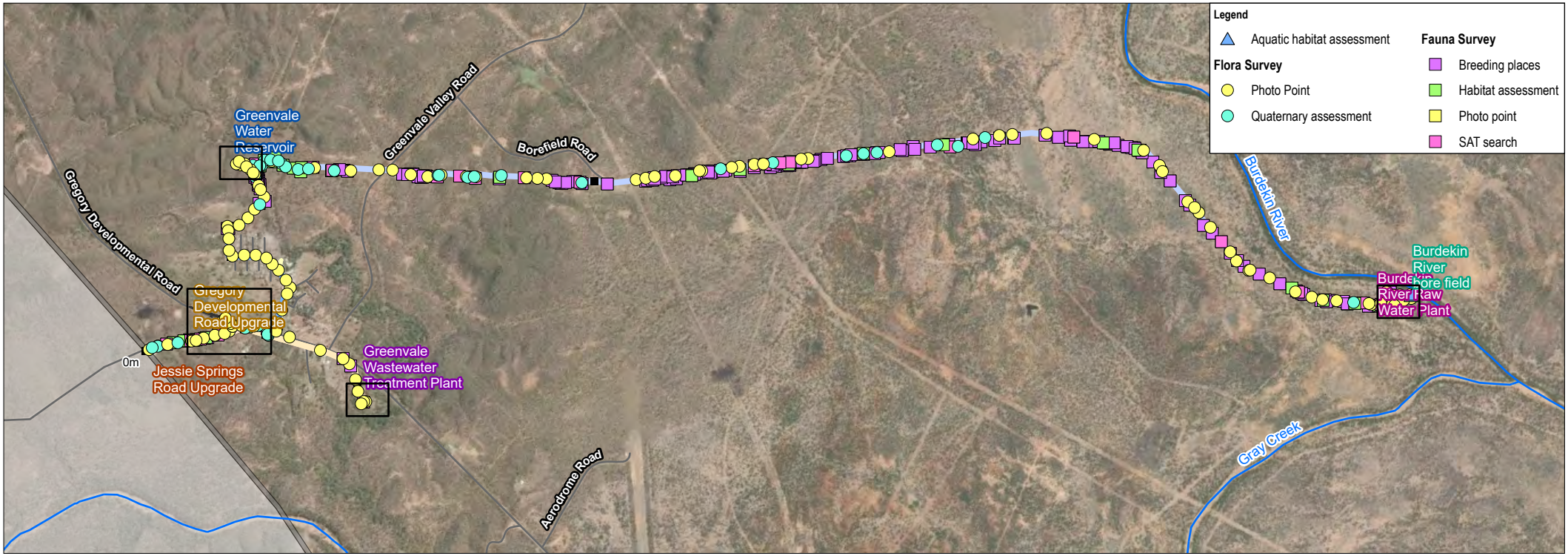
3.6 Animal ethics and legislative permits

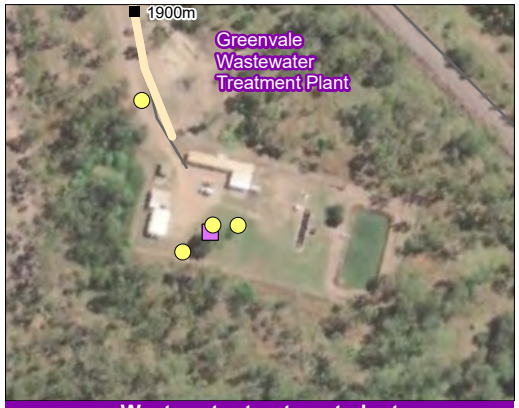
Field surveys were conducted in accordance with the following permits and approvals:

– Department of Employment, Economic Development and Innovation Scientific Users Registration Certificate (Registration Number 132).
– DES Scientific Purposes Permit (permit number WSIP15723315).
– Animal Research Authority issued by the accredited Animal Ethics Committee.
– Australian Code of Practice for the Care and Use of Animals for Scientific Purposes.

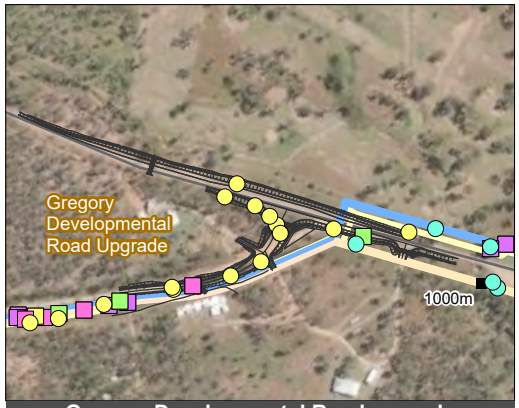
In accordance with Part 13 of the EPBC Act, no killing, injuring, taking, trading, keeping or moving of a member of the following occurred as a part of the survey efforts:

– Listed threatened species or ecological communities (refer to section 196 and 196A-196E of the EPBC Act).
– Listed migratory species (sections 211, 211A-211E).



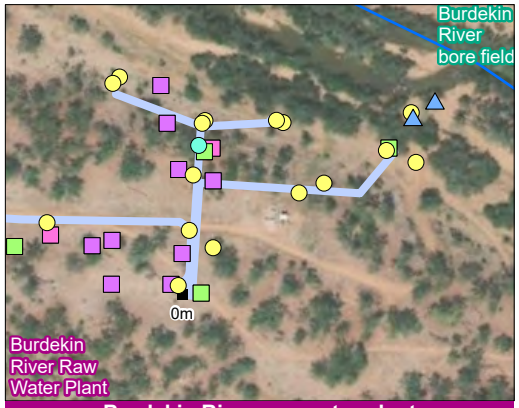


Wastewater treatment plant



Gregory Developmental Road upgrade

Greenvale water reservoir



Burdekin River raw water plant

Legend

- 1km marker
- Raw Water
- Raw Water Treated
- Sewer rising main
- GVTA telecommunications services upgrade
- Road
- Greenvale Training Area

Paper Size ISO A4

0 0.5 1 1.5

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

Department of Defence
ASMTI Greenvale Initial Works

Field survey effort

Project No. **12547012**
Revision No. **1**
Date **09 Mar 2023**

FIGURE 2

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00201-1
Print date: 09 Mar 2023 - 17:16

Data source: GHD: Aquatic Survey Site, Flora Survey Site, Fauna Survey Site, Site Layout (2022), DoR: Roads, Waterways (2022), World Imagery: Maxar.

4. Desktop review results

4.1 Land use and tenure

The Initial Works footprint is situated in the vicinity of Greenvale which is a rural township and located in outback central Queensland and adjacent to the GVTA.

The Initial Works footprint is within the CTRC local government area. The footprint is predominately within an undeveloped rural setting and has a dominant land use of livestock farming. The southern end of the Initial Works footprint traverses the Greenvale township which has mixed land uses for residential land and utility services. The Greenvale township has notable infrastructure such as a school, public pool, tennis courts, police station, public hall, together with farming outhouses, sheds and water treatment and storage facilities.

Exploration permit (EPM 26559) held by Sconi Mining Operations Pty Ltd covers the entirety of the Initial Works footprint.

Specifically, the proposed action is to generally occur within land parcels currently operating for a similar purpose (water extraction bore field, water treatment plant, wastewater treatment plant, road reserve and Greenvale SCAX Exchange) or within existing pipe and road reserve alignments, minimising impact to undisturbed land.

4.2 Landscape context

4.2.1 Description of the Initial Works footprint

The Initial Works footprint extends approximately 8 km west from the banks of the Burdekin River to the township of Greenvale. The Initial Works footprint covers large areas of undulating terrain and gentle slopes with the exception of the Greenvale reservoir and water treatment plant which is positioned on a hill crest. The surrounding landscape consists of flat alluvial country and floodplains fronting creeks, as well as mountainous areas with cliffs, steep hills, tabletops and escarpments. The area is located between the Great Dividing Range (approximately 30 km west) and Pelican Lake Range (approximately 20 km northeast).

To the north of the Initial Works footprint, there are mountain ranges of substantial topographical and geomorphological variation which include the Ironstone Mountain (height of 636 m) and One Tree Hill (height of 475 m). The Initial Works footprint is located immediately west of the Burdekin River, a major landform in the region. Extent of flow within the Burdekin River is rain event dependant with substantial changes between wet and dry season flow.

4.2.2 Catchment values

Overview

The Initial Works footprint is located within the Burdekin River catchment and includes two sub-basins in the Greenvale area which are Clarke River and Gray Creek. These watercourses discharge into the Burdekin River, which discharges into the Coral Sea at Ayr. The Initial Works footprint traverses 11 watercourses and/or tributaries which either flow into Gray Creek (which discharges into the Burdekin River) or directly into the Burdekin River.

4.2.3 Groundwater dependent ecosystems

There are no Groundwater Dependent Ecosystems (GDE) mapped with the Initial Works footprint. The closest mapped GDE is Poison Lake which is 10 km northeast of the Initial Works footprint.

4.2.4 Listed wetlands

Ramsar wetlands of international importance

No Ramsar wetlands occur within or adjacent to the Initial Works footprint. The nearest Ramsar listed wetland is the Bowling Green Bay wetland located approximately 206 km southeast of the initial Works footprint. The Burdekin River meets the ocean some 35 km south of Bowling Green Bay, greater than 600 km downstream of the Initial Works footprint. Therefore, the Bowling Green Bay is not hydraulically connected to the Upper Burdekin catchment in which the Initial Works footprint is located.

Directory of Important Wetlands in Australia (DIWA)

No DIWA listed wetlands are located within or adjacent to the Initial Works area. The nearest DIWA wetland is the Poison Lake wetland which is located 10 km northeast of water extraction infrastructure at the Burdekin River. Other wetlands listed on the DIWA include Valley of Lagoons which is 25 km north of the Initial Works footprint and Lake Lucy Wetlands which is 48 km northeast of the Initial Works footprint.

State listed wetlands

No Matters of State Environmental Significance (MSES) wetlands of High Ecological Significance (HES) and Wetland Protection Area (WPA) are located within Initial Works area. The closest HES and WPA is an unnamed wetland, located 9.5 km northeast of the Initial Works area, with an aquatic conservation score of 'very high' and covers an approximate area of 8 km^2. Furthermore, no MSES regulated vegetation (100 m from a wetland) is mapped within the Initial Works.

4.3 Flora

4.3.1 Threatened ecological communities

No TECs protected under Commonwealth legislation (EBPC Act) were identified in the PMST searches within a 1 km or 10 km search extent from the Initial Works footprint. The results of the PMST searches are included in Appendix A.

Following a review of the Queensland Government RE mapping (Queensland Government, 2022), the desktop assessment identified that no REs that correspond to TECs are mapped within the Initial Works footprint.

4.3.2 Vegetation Management Act regulated vegetation

The majority of the vegetation within the Initial Works footprint is currently mapped under the Queensland (version 6.06) Regulated Vegetation mapping as Category B remnant vegetation, protected under the VM Act (Figure 3) (Appendix A). Small sections of the Initial Works footprint intersect Category C high-value regrowth vegetation, Category R reef regrowth watercourse vegetation and Category X non-remnant vegetation along the water supply pipeline and surrounding Greenvale (Figure 3) (Appendix A).

4.3.3 Regional ecosystems

REs are groupings of vegetation communities that are consistently associated by a particular combination of geology, landform and soil (Sattler and Williams, 1999). RE mapping is conducted DoR and legislated under the Queensland VM Act. RE mapping can be used to identify areas of habitat for conservation significant fauna and potential TECs, as well as identify vegetation communities listed under the Queensland VM Act.

No endangered REs are mapped within the Initial Works footprint (Figure 3). Only one of the mapped REs within the Initial Works footprint is classed as Of Concern under the VM Act, with the remaining 13 REs being classed as Least Concern under the VM Act (Table 12). Table 12 outlines the identity, classification under the VM Act and Biodiversity Status and the brief description of RE types within the Initial Works footprint. The RE Report is included in Appendix A.

Table 12 REs mapped within the Initial Works footprint

Regional ecosystem	VM Act status	Biodiversity status	RE description
9.11.2a	LC	NC	*Eucalyptus crebra* (or several other ironbark species) +/- *Corymbia spp.* woodland on shallow texture contrast soils on low metamorphic hills and lowlands
9.11.2d	LC	NC	*Eucalyptus crebra* (or several other ironbark species) +/- *Corymbia spp.* woodland on shallow texture contrast soils on low metamorphic hills and lowlands
9.11.5	LC	NC	*Eucalyptus persistens* +/- *E. crebra* woodland on low metamorphic hills
9.3.1	LC	OC	*Eucalyptus camaldulensis* and/or *E. tereticornis* +/- *Melaleuca spp.* +/- *Casuarina cunninghamiana* fringing woodland on channels and levees
9.3.12a	LC	OC	River beds and associated waterholes on major rivers and channels
9.3.16	LC	OC	*Eucalyptus tereticornis* and/or *E. platyphylla* and/or *Corymbia clarksoniana* woodland on alluvial flats, levees and plains
9.3.22a	LC	OC	*Eucalyptus crebra* or *E. cullenii* +/- *Corymbia spp.* open woodland on alluvial levees and terraces
9.3.3a	LC	OC	*Corymbia spp*. and *Eucalyptus spp.* dominated mixed woodland on alluvial flats, levees and plains
9.3.3b	LC	OC	*Corymbia spp*. and *Eucalyptus spp*. dominated mixed woodland on alluvial flats, levees and plains
9.3.6a	LC	NC	*Eucalyptus platyphylla* +/- *Eucalyptus spp*. +/- *Corymbia spp*. woodland on alluvial plains
9.5.11	LC	NC	*Eucalyptus persistens* +/- *E. crebra* woodland on flats on Tertiary remnant plains
9.7.1a	LC	NC	*Eucalyptus persistens* woodland on lateritised and deeply weathered surfaces on undulating terrain
9.7.1b	LC	NC	*Eucalyptus persistens* woodland on lateritised and deeply weathered surfaces on undulating terrain
9.7.3c	LC	NC	*Eucalyptus crebra* or *E. portuensis* +/- *Corymbia clarksoniana* woodland on lateritised surfaces and edges of Tertiary surfaces
Key to table: OC – of concern, LC – least concern, NC – no concern at present			

4.3.4 Conservation significant flora

The PMST search identified four EPBC-listed flora species predicted to occur within the Study area based on bioclimatic modelling, habitat preferences and knowledge of species distributions, as detailed in Table 13. None of the four species identified in the PMST search have been historically recorded within the Study area. One additional conservation significant flora species, listed under the NC Act has been historically recorded in the Study area, according to the WildNet Conservation Significant Species List Report (refer Appendix A), summarised in Table 13.

Table 13 Conservation Significant Flora within the Initial Works footprint

Scientific name	EPBC Act status	NC Act status	Source
Acacia crombiei	Vulnerable	Vulnerable	PMST
Cycas platyphylla	Vulnerable	Vulnerable	PMST
Dichanthium setosum	Vulnerable	Least concern	PMST
Tephrosia leveillei	Vulnerable	Least concern	PMST
Lepturus minutus	Not listed	Vulnerable	Wildnet

4.3.5 Protected plant trigger areas

High-risk flora trigger areas represent areas that are within a 2 km radius of a validated record of a conservation significant plants species and/or contain habitat highly likely to have one or more conservation significant plant species. Protected plants trigger areas are mapped by the Queensland DES and incorporate EPBC-listed species.

The DES Protected Plants Trigger Mapping did not identify any protected plants within the Initial Works footprint. The closest protected plants trigger area is mapped approximately 8 km southeast of the proposed Greenvale wastewater treatment plant. A copy of the Protected Plants Flora Survey Trigger Map is included in Appendix A.

4.4 Fauna

4.4.1 Essential habitat

Essential habitat for protected wildlife refers any area of remnant or regrowth vegetation shown on the regulated vegetation management map that:

– Have at least three essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
– In which the protected wildlife, at any stage of its life cycle, is located.

Essential habitat is mapped by the DES and includes values for NC Act-listed species.

The Initial Works footprint intersects one site of essential habitat buffer which is located immediately surrounding the Greenvale township (Table 14). The species for which the essential habitat is identified for is identified in Table 14 below.

Table 14 Species identified in essential habitat buffer

Common name	Scientific name	EPBC Act status	NC Act Status	Vegetation community (essential habitat requirements)
Masked owl (northern)	*Tyto novaehollandiae kimberli*	V	V	Dry and wet sclerophyll forest (including riparian), rainforest, woodland (including melaleuca swamps) & mangroves; feeding mostly in open country and cleared land along ecotones (e.g. canefield margins) and roosting in dense cover. Nest in tree hollow (40-500 cm deep and 45-100 cm diameter) in forested (usually eucalypt) area 10-30 m above ground.
Key to table: V – vulnerable.				

A copy of the Regulated Vegetation Map Search which identifies the location of the essential habitat and identifies the species the essential habitat is for, is included in Appendix A of this Biodiversity Values Report.

4.4.2 Conservation significant fauna

The PMST search (refer Appendix A) identified 16 conservation significant fauna species for which habitat is predicted to occur within 1 km of the Initial Works footprint. This comprised:

– Eight birds.
– Seven mammals.
– One reptile.

The PMST search is a conservative predictive search tool, based on bioclimatic modelling, species distribution and habitat preferences.

Of those species identified in the PMST search, three species, the red goshawk, black-throated finch (southern) and masked owl (northern) have been previously recorded within 10 km of the Initial Works footprint. Table 15 outlines the conservation significant fauna species identified in the PMST search.

Table 15 Conservation significant fauna species

Common name	Scientific name	Conservation status		Source
		EPBC	NC Act	
Birds				
Curlew sandpiper	*Calidris ferruginea*	CE	CE	PMST
Red goshawk	*Erythrotriorchis radiatus*	E	E	PMST
Gouldian finch	*Erythrura gouldiae*	E	E	PMST, Wildnet
Black-throated finch (southern)	*Poephila cincta cincta*	E	E	PMST, Wildnet
Australian painted snipe	*Rostratula australis*	E	E	PMST
Grey falcon	*Falco hypoleucos*	V	V	PMST
Squatter pigeon (southern)	*Geophaps scripta scripta*	V	V	PMST
Masked owl (northern)	*Tyto novaehollandiae kimberli*	V	V	PMST, Wildnet
Mammals				
Northern quoll	*Dasyurus hallucatus*	E	LC	PMST
Koala	*Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)*	E	E	PMST
Ghost bat	*Macroderma gigas*	V	E	PMST
Black-footed tree-rat	*Mesembriomys gouldii rattoides*	V	LC	PMST
Greater glider (northern)	*Petauroides minor*	V	V	PMST
Greater large-eared horseshoe bat	*Rhinolophus robertsi*	V	E	PMST
Bare-rumped sheath-tailed bat	*Saccolaimus saccolaimus nudicluniatus*	V	E	PMST
Reptiles				
Yakka Skink	*Egernia rugosa*	V	V	PMST

Key to table: CE – Critically endangered, E – Endangered, V – Vulnerable, LC – Least Concern

4.4.3 Migratory species

The PMST (refer Appendix A) identified 13 migratory species for which habitat is predicted to occur within 1 km of the Initial Works footprint based on bioclimatic modelling, species distribution and preferential habitat. Table 16 presents the migratory species that were identified in the PMST search for a 1 km buffer of the Initial Works footprint.

Table 16 Conservation significant migratory species

Common name	Scientific name	Conservation status		Source
		EPBC	NC Act	
Migratory Marine Birds				
Fork-tailed Swift	*Apus pacificus*	Mig, Mar	SL	PMST
Migratory Terrestrial Species				
Common Sandpiper	*Actitis hypoleucos*	Mig, Mar	SL	PMST
Oriental Cuckoo, Horsfield's Cuckoo	*Cuculus optatus*	Mig, Mar	SL	PMST
Barn Swallow	*Hirundo rustica*	Mig, Mar	SL	PMST
Grey Wagtail	*Motacilla cinerea*	Mig, Mar	SL	PMST
Yellow Wagtail	*Motacilla flava*	Mig, Mar	SL	PMST
Satin Flycatcher	*Myiagra cyanoleuca*	Mig, Mar	SL	PMST
Migratory Wetlands Species				
Curlew Sandpiper	*Calidris ferruginea*	CE, Mig, Mar	CE	PMST
Common Sandpiper	*Actitis hypoleucos*	Mig, Mar	SL	PMST
Sharp-tailed Sandpiper	*Calidris acuminata*	Mig, Mar	SL	PMST
Pectoral Sandpiper	*Calidris melanotos*	Mig, Mar	SL	PMST
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii*	Mig, Mar	SL	PMST
Osprey	*Pandion haliaetus*	Mig, Mar	SL	PMST
Common greenshank	*Tringa nebularia*	Mig, Mar	SL	PMST

Key to table: CE - Critically Endangered, Mig – Migratory, Mar – Marine, SL – Special least concern

4.5 Biosecurity matters

4.5.1 Pest flora species

A WildNet search (refer Appendix A) identified nine pest flora species which have been recorded in the Initial Works footprint. Of these nine species, no WoNS have been recorded in the Initial Works footprint (refer Table 17) (DES, 2022c). Five species have management strategies within the *Charters Towers Regional Council Biosecurity Plan 2019-2024* (CTRC, 2019).

Table 17 Pest flora species likely to occur within the Initial Works footprint

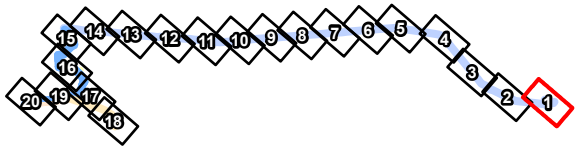
Common name	Scientific name	Cth WoNS	Biosecurity Act Category	CTRC Bio Plan Priority	Source
Yellow Oleander / Captain Cook bush	*Cascabela thevetia*		Invasive restricted category 3	Medium	WildNet
-	*Distimake quinquefolius*		-	-	WildNet
Lance crotalaria	*Crotalaria lanceolata subsp. lanceolata*		-	-	WildNet
Leucaena	*Leucaena leucocephala*		-	Medium	WildNet
Coffee senna	*Senna occidentalis*		-	-	WildNet
-	*Ammannia auriculata*		-	-	WildNet
Thatch Grass	*Hyparrhenia rufa subsp. rufa*		-	Low	WildNet
Giant rat's tail grass	*Sporobolus natalensis*		Invasive restricted category 3	High	WildNet
Grader grass	*Themeda quadrivalvis*		-	Medium	WildNet

4.5.2 Pest fauna species

Two pest fauna species have been historically located within 1 km of the Initial Works footprint according to a WildNet Search (refer Appendix A). Table 18 identifies the pest fauna species identified within 1 km of the Initial Works footprint.

Table 18 Pest fauna species likely to occur within the Initial Works footprint

Common name	Scientific name	Source
House sparrow	*Passer domesticus*	WildNet
Feral pig	*Sus scrofa*	WildNet



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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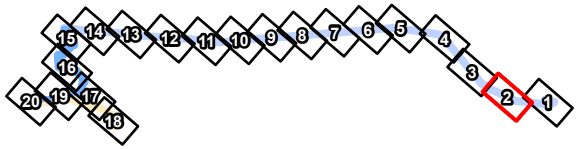
FIGURE 3-1

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:45

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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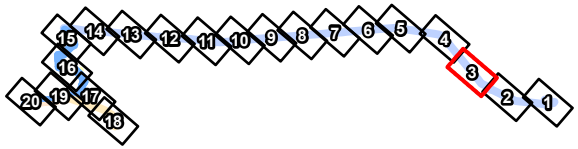
FIGURE 3-2

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:46

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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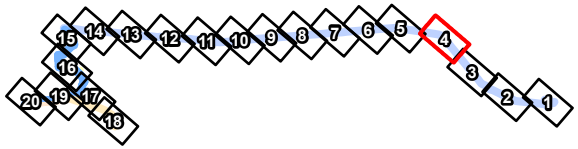
FIGURE 3-3

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:46

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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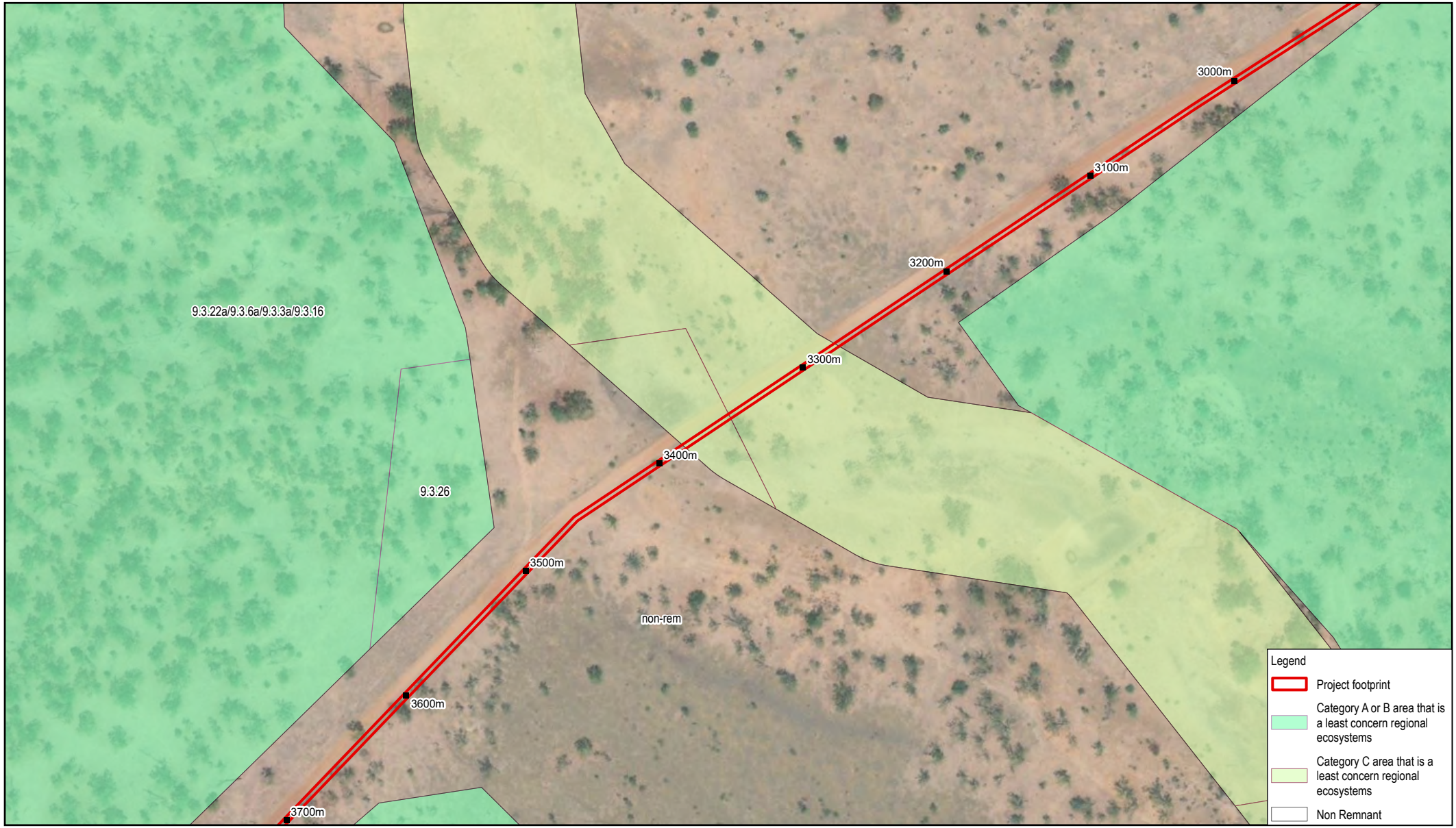
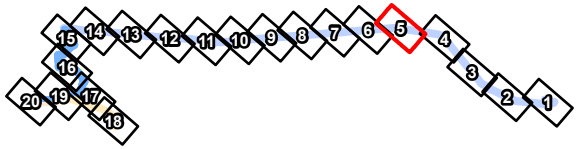
FIGURE 3-4

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:46

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.





Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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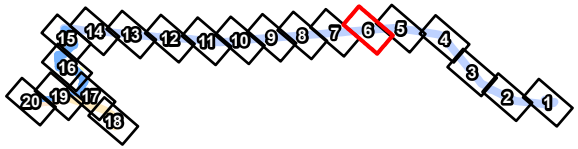
FIGURE 3-5

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:47

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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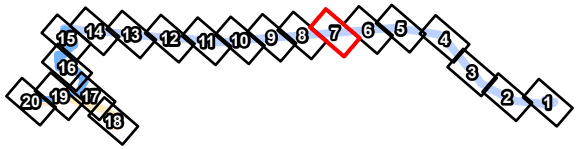
FIGURE 3-6

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:47

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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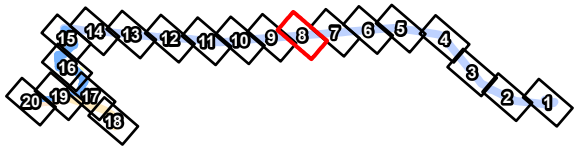
FIGURE 3-7

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:47

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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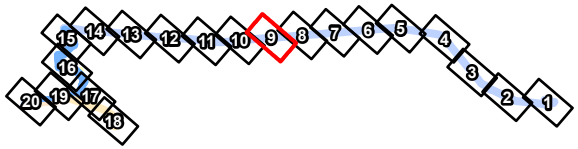
FIGURE 3-8

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:48

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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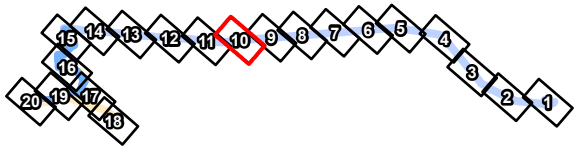
FIGURE 3-9

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:48

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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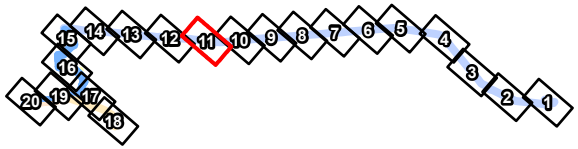
FIGURE 3-10

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:48

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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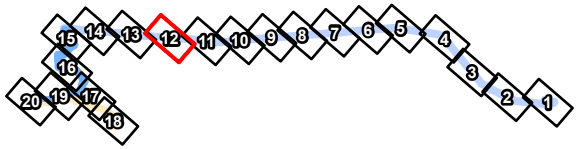
FIGURE 3-11

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:48

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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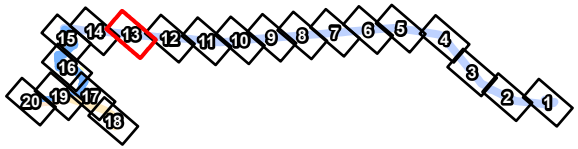
FIGURE 3-12

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:49

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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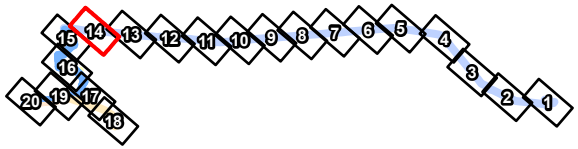
FIGURE 3-13

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:49

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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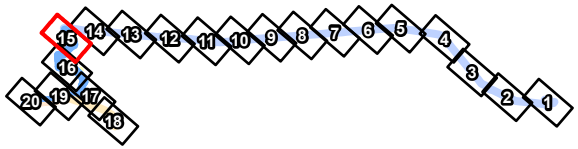
FIGURE 3-14

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:49

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Ecological values identified from the desktop assessment

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FIGURE 3-15

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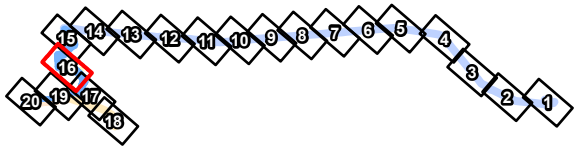
Print date: 09 Mar 2023 - 16:50

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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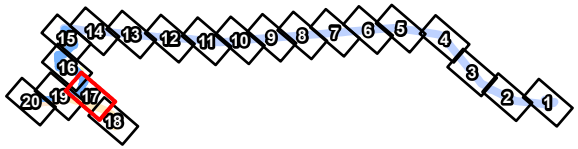
Date **09 Mar 2023**

FIGURE 3-16

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:50

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Department of Defence
ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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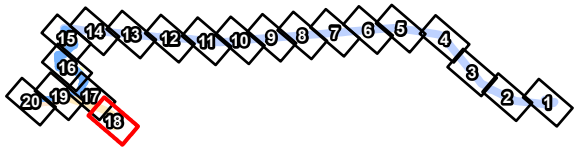
FIGURE 3-17

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:50

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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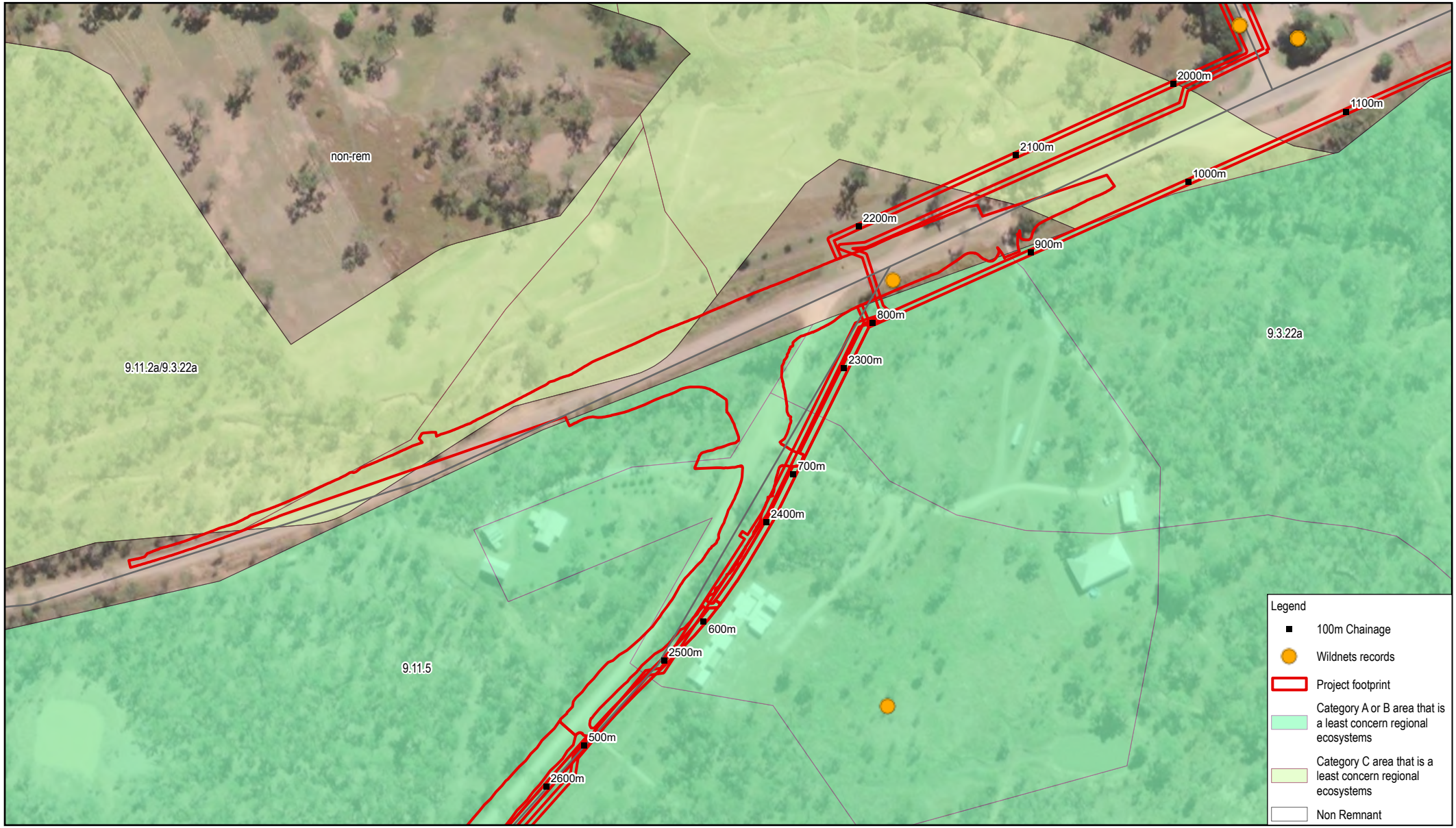
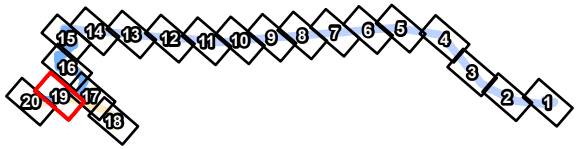
FIGURE 3-18

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:51

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.





Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

Project No. **12547012**
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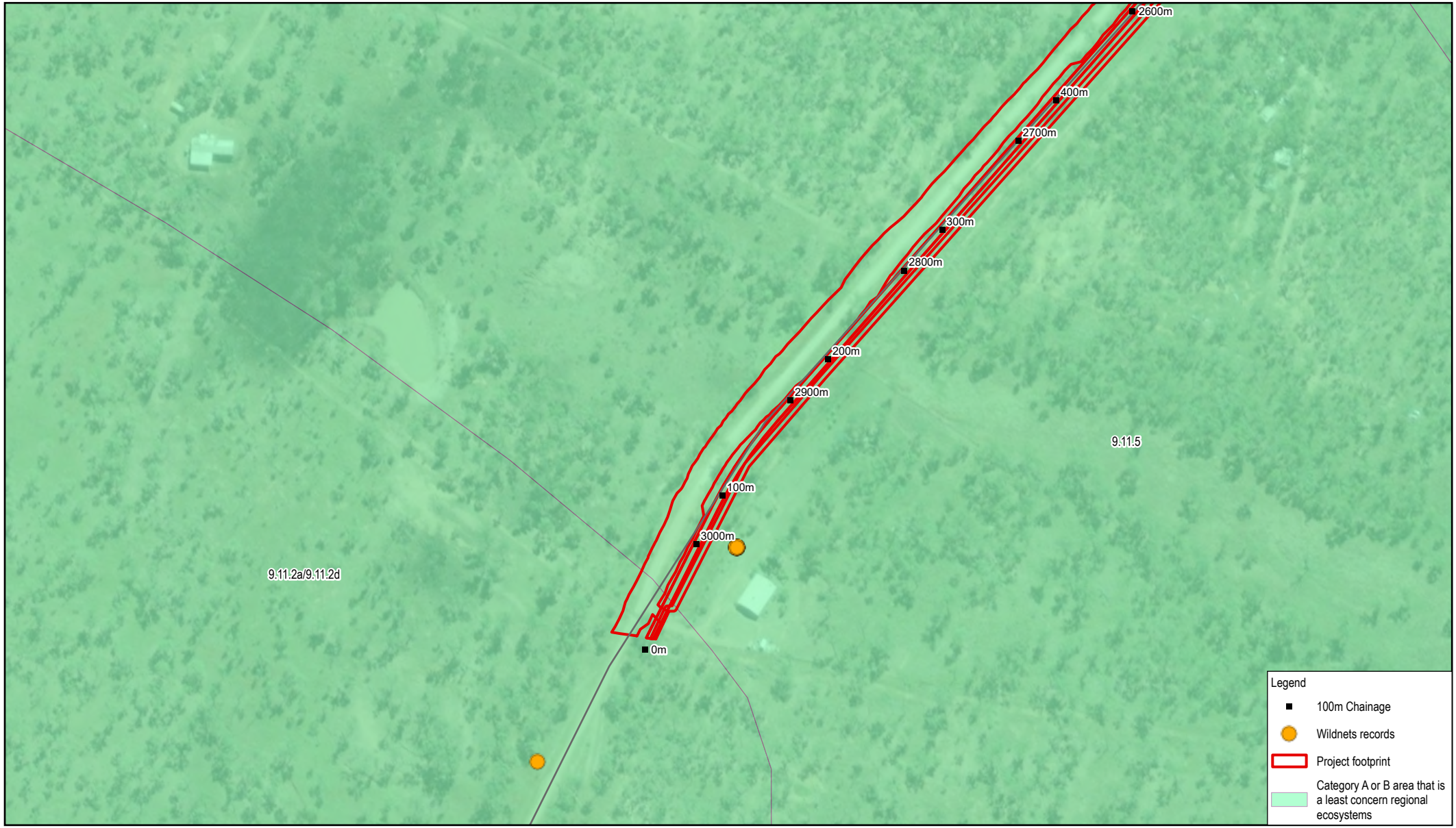
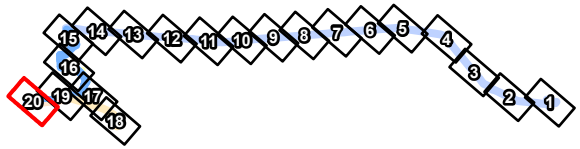
FIGURE 3-19

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:51

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.





Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Department of Defence
ASMTI Greenvale Initial Works

Ecological values identified from the desktop assessment

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Revision No. **1**
Date **09 Mar 2023**

FIGURE 3-20

N:\AU\Brisbane\Projects\42\12547012\GIS\Maps\Working\12547012_EPBC.aprx\EST00355GVTA-PW-EN-GHD-GIS-00204-1
Print date: 09 Mar 2023 - 16:51

Data source: GHD: Project Footprint, Chainages (2023); DoR: Road (2019), Watercourse (2019), Town (2021), Regional Ecosystems (v12.02), Essential Habitats (2022);World Imagery: Maxar.

5. Field values

5.1 Threatened Ecological Communities

No field verified REs within the Initial Works footprint are known to correspond with any listed TECs based on the individual listing advice for each TEC. As none of the vegetation communities correspond to a TEC, field verification of TECs was not required during the field surveys.

5.2 Regulated vegetation and Regional Ecosystems

The field-verified vegetation within the Initial Works footprint was predominantly non-remnant (Category X). Some sections of the Greenvale water supply upgrade were field verified as intersecting remnant (Category B) and regrowth (Category C or R) vegetation. A small portion of the Burdekin River water extraction facility intersected remnant vegetation.

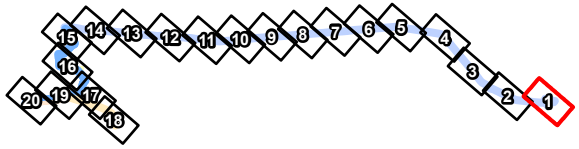
A number of discrepancies and refinements between the Queensland DoR mapping and field verified RE were noted. The DoR RE mapping for the Initial Works footprint was predominantly remnant heterogenous patches of least concern REs under the VM Act. Most of these patches were field verified as non-remnant south of the water tank from chainage 400 through the township and along Gregory Developmental Road and Jessie Springs Road. The Greenvale water supply upgrade pipeline was mostly field verified as intersecting remnant least concern vegetation. The cleared corridor containing the pipeline was too narrow to map out as non-remnant vegetation as per the RE mapping rules described in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland – Version 6* (Neldner et. al, 2022). Vegetated patches within the Initial Works footprint were all field verified to only be one homogenous remnant RE per polygon, all of which are least concern under the VM Act. No regrowth REs were recorded within the Initial Works footprint. A floristic description of the REs within the Initial Works footprint are provided in Table 19. The field verified REs within the Initial Works footprint are displayed in Figure 4.

In general, the condition of the vegetation within the Initial Works footprint was poor due to clearing, weed infestation and cattle/feral animal presence. Weed presence was high in most of the area where the Gregory Developmental Road and Jessie Springs Road intersection upgrade works are proposed. Two sections of the Greenvale water supply upgrade pipeline intersected patches of good quality remnant vegetation as these sections had no previous impacts of clearing, significant weed infestations or grazing impacts. One section is located between chainage 9,000 to 9,500; the other is located between chainage 3,800 and 6,800 (refer Figure 4).

Table 19 *Field verified REs*

Field verified RE	Field description	Representative photograph
Remnant 9.3.3b	T1 – *Eucalyptus platyphylla, Eucalyptus crebra, Corymbia clarksonii* (14 m tall, 25 % cover). T2 – T1 juveniles, *Hakea lorea* (5 m tall, 5 % cover). G – *Heteropogon contortus, Melinis repens*, Themeda triandra.* Alluvial soils.	
Remnant 9.3.22a	T1 – *Eucalyptus crebra, Corymbia clarksoniana, Corymbia dallachiana, Eucalyptus platyphylla, Corymbia erythrophloia* (16 m tall, 30 % cover). T2 – T1 juveniles, *Cassia brewsteri* (7 m tall, 10 % cover). S – T1 and T2 juveniles, *Carissa lanceolata, Acacia* spp. (10 %). G: *Themeda triandra, Melinis repens*, Bothriochloa decipiens, Digitaria ciliaris.* Recent alluvial soils.	
Remnant 9.5.11	T1 – *Eucalyptus persistens, Eucalyptus crebra, Corymbia dallachiana.* Sometimes with associate *Eucalyptus brownei* (15 m tall, 30 % cover). T2 – T1 juveniles, *Cassia brewsteri* (3 – 8 m tall, 10 % cover). S – *Carissa lanceolata*, *Acacia* spp. (15 %). G - *Themeda triandra, Melinis repens*, Bothriochloa decipiens, Digitaria ciliaris.* Old alluvial plains.	
Remnant 9.7.1a	T1 – *Eucalyptus persistens, Acacia shirleyi* (12 m tall, 20 % cover). T2 – T1 juveniles, dominated by *Acacia shirleyi* (3 – 8 m tall, 20 % cover). S – T1 and T2 juveniles, *Carissa lanceolata* (15 %). G - *Themeda triandra.* Rocky undulating hills and slopes.	
Remnant 9.11.1a	T1 – *Eucalyptus shirleyi, Corymbia dallachiana* (5 – 10 m, 20 % cover). S – T1 juveniles, *Petalostigma pubescens* (20 % cover). G – *Themeda triandra, Heteropogon contortus.* Skeletal soils on rocky metamorphic slopes.	

Field verified RE	Field description	Representative photograph
Remnant 9.11.5	T1 – *Eucalyptus persistens* (11 m, 30 % cover). T2 – T1 juveniles, *Acacia* spp. (10 % cover). S – *Acacia spp.* (10 % cover). G – *Themeda triandra, Heteropogon contortus.* Skeletal soils on rocky metamorphic slopes.	
Key: * - introduced species; T1 – canopy layer, T2 – sub-canopy layer, S – shrub layer; G – ground layer		



Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-1

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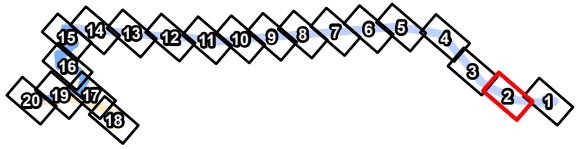

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-2

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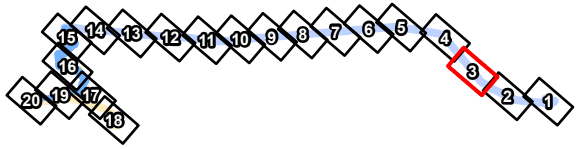
Print date: 09 Mar 2023 - 17:06

Data source: GHD: Site Layout, Field Verified Regional Ecosystem (2022); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.



Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-3

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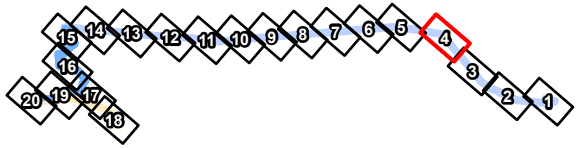

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-4

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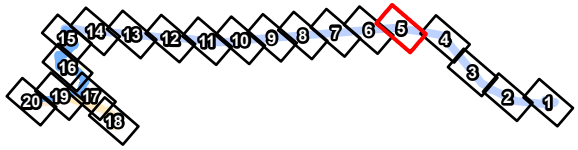

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-5

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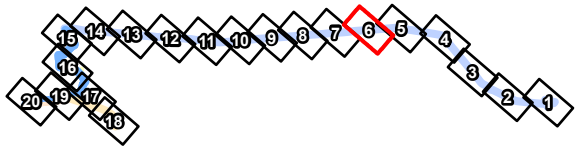

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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-6

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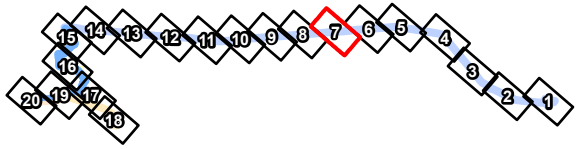

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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-7

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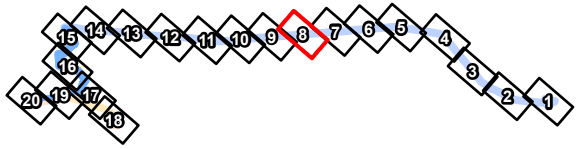

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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-8

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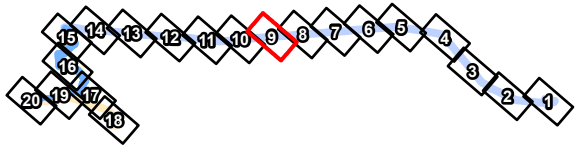

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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-9

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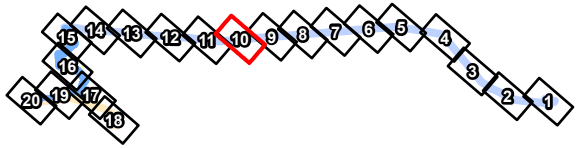

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FIGURE 4-10

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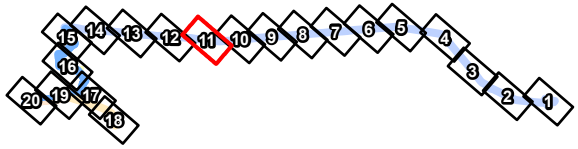

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-11

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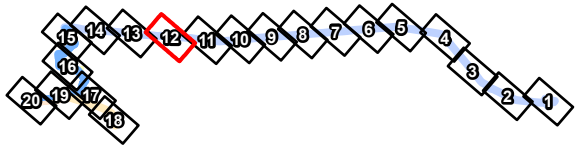

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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FIGURE 4-12

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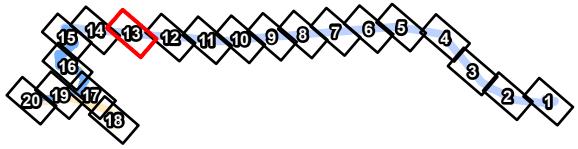

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-13

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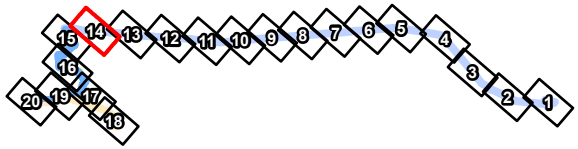

Paper Size ISO A4

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-14

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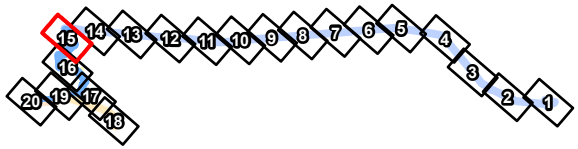

Paper Size ISO A4

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-15

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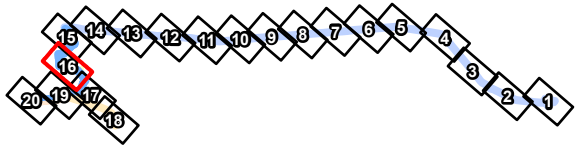

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-16

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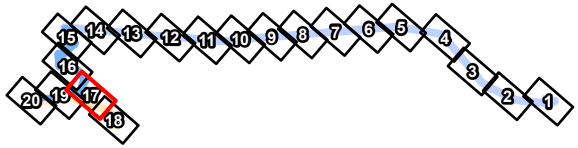

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-17

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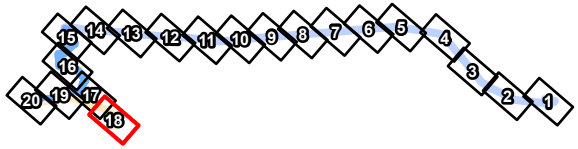

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-18

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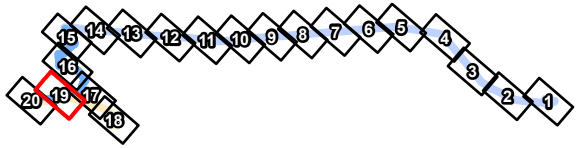

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-19

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Print date: 09 Mar 2023 - 17:09

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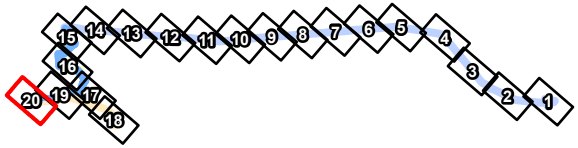

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 4-20

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Print date: 09 Mar 2023 - 17:10

Data source: GHD: Site Layout, Field Verified Regional Ecosystem (2022); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

5.3 Vegetation communities and fauna habitat

Historically, the landscape has been impacted by decades of disturbance from cattle grazing, vegetation clearing and intrusion by invasive weeds. These processes have altered local ecosystem composition and processes, reducing in places the density of native vegetation including eucalypts, and habitat for threatened species. Additionally, the location of the infrastructure has been designed to avoid remnant and/or higher quality habitat where possible, and to utilise historically cleared pipeline corridors and access tracks or roads. This has resulted in a fairly small impact on remnant vegetation within the Initial Works footprint.

Five broad vegetation communities and corresponding fauna habitat types were identified within the Initial Works footprint during the field survey. The vegetation communities observed within the Initial Works footprint include the following and are mapped in Figure 5:

- 0.20 ha of mature *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils or plains and low stony rises on downs (corresponds to REs 9.3.3b, 9.3.22a, 9.5.11 and 9.7.1a).
- 0.14 ha of mature *Eucalyptus/Corymbia* woodland on stony rises and hills (corresponds to REs 9.11.1a and 9.11.5).
- 0.04 ha of Freshwater creek lines and drainage lines (corresponds to any RE intersecting a mapped watercourse).
- 3.07 ha of historically cleared vegetation with emergent *Eucalyptus* scattered *Acacia* regrowth (corresponding to non-remnant vegetation).
- 5.19 ha of cleared or significantly modified areas (corresponding to non-remnant vegetation).

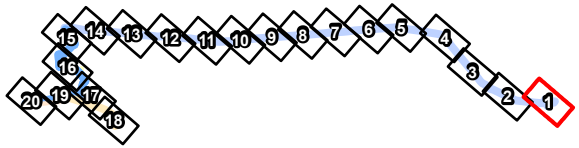
A representative photograph and description of each vegetation community and habitat type is provided in Table 20, together with identification of MNES and MSES with potential to occur. The vegetation communities and fauna habitats are provided in Figure 5. Corresponding REs for each vegetation community is also provided in Table 20 and shown on Figure 4 which presents the field verified RE mapping.

Table 20 Field verified vegetation communities and fauna habitat

Vegetation community / fauna habitat type	Description
Remnant *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils or plains and low stony rises on downs (corresponds to RE 9.3.3b, 9.3.22a, 9.5.11 and 9.7.1a)	
	– High density of hollow-bearing trees present. Hollow sizes included small to mid-size (<10 cm to 2 cm diameter), providing habitat for roosting microbats, arboreal reptiles and amphibians, hollow-nesting birds (i.e. parrots and lorikeets) and arboreal mammals including greater glider (northern). There were also an abundance of large hollows (>30 cm diameter) for hollow nesting birds (i.e. cockatoos and arboreal mammals. – Ground-level microhabitats were variable but relatively dense in availability of ground hollow and non-hollow bearing logs, large and small woody debris, log piles and leaf litter providing shelter and foraging habitat for small to medium sized mammals, reptiles and amphibians. – Abundant termite mounds were present as a food source for insectivorous reptiles and mammals. – Groundcover densities were high throughout vegetated areas due to the regular rainfall Greenvale received over spring. A mixture of native and introduced grasses were present that consistently covered the ground. – Potential conservation significant species: red goshawk, koala, greater glider (northern), black-throated finch (southern), squatter pigeon (southern), and fork-tailed swift.

Vegetation community / fauna habitat type	Description
Eucalyptus/Corymbia woodland on stony rises and hills (corresponds to RE 9.11.1a and 9.11.5)	
	– Ground-level microhabitats were variable but moderately dense in availability of ground hollow and non-hollow bearing logs, large and small woody debris, log piles and leaf litter providing shelter and foraging habitat for small to medium sized mammals, reptiles and amphibians. Rocky outcrops and rock piles were common in this habitat, providing cracks to shelter small mammals and reptiles including snakes, lizards and geckoes. – Abundant termite mounds were present as a food source for insectivorous reptiles and mammals. – Moderately thick understorey of shrubs for habitat of smaller woodland birds (i.e. fairy-wrens and finches). – Groundcover densities was high throughout vegetated areas with some more exposed areas due to the presence of rockier soils and exposed bedrock. A mixture of native and introduced grasses were present that consistently covered the ground. – Potential conservation significant species: squatter pigeon (southern), koala and black-throated finch (southern)
Freshwater creek lines and drainage lines (corresponds to any RE intersecting a mapped watercourse)	
	– Fringing riparian vegetation along ephemeral waterways were dominated by *Eucalyptus* and *Corymbia* spp. containing abundant hollows and occasionally, *Melaleuca* and *Casuarina* spp. – *Melaleuca* and *Eucalyptus* species flowers provide foraging opportunities for honeyeaters and parrots. – Ground-level microhabitats, including coarse woody debris and dense ground cover, provide shelter and foraging habitat for a variety of reptile, amphibian and small mammal species. – Instream sandy or silty soils with exposed roots, trailing vegetation and shallow water edges. – Abundant termite mounds were present as a food source for insectivorous reptiles and mammals. – An important movement corridor for native mammals, birds, reptiles and amphibians, and are important foraging routes and flyways for microbats. – Potential conservation significant species: Red goshawk, black-throated finch (southern), greater glider (northern), squatter pigeon (southern), koala, satin flycatcher, and fork-tailed swift.
Historically cleared vegetation with emergent *Eucalyptus* scattered *Acacia* regrowth (corresponding to non-remnant vegetation)	
	– Low density of hollow bearing trees in the emergent *Eucalyptus* and stags. – Increased presence of introduced flora. – Increased erosion potential due to extent of bare ground. – Dense grass cover due to lack of canopy including both native and exotic groundcover species. – Provides foraging habitat for aerial insectivores and raptors. – Nesting habitat for ground-dwelling birds. – Potential flyways for foraging microbats. – Abundant termite mounds were present as a food source for insectivorous reptiles and mammals. Potential conservation significant species: black-throated finch (southern), squatter pigeon (southern), and koala.

Vegetation community / fauna habitat type	Description
Cleared or significantly modified areas (corresponding to non-remnant vegetation)	
 	– Complete absence of vegetation or only isolated and scattered retained *Eucalypts/Corymbia spp.* – Includes sections of highly modified residential gardens which includes mown lawns and exotic tree species. – Mown or seeded lawns provide habitat for invasive or urbanised birds such as common mynas, noisy miners, cockatoos, galahs and apostlebirds. – Not habitat for conservation significant species.



Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Field verified vegetation communities and general fauna habitat

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FIGURE 5-1

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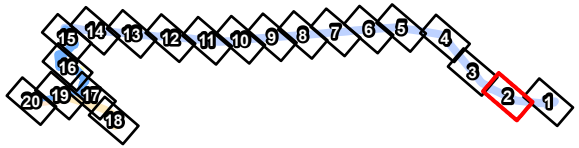

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-2

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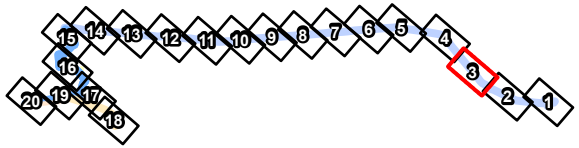
Print date: 26 May 2023 - 17:18

Data source: GHD: Site Layout, Breeding Places, Field Verified Vegetation Communities & Fauna Habitats (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community.



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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-3

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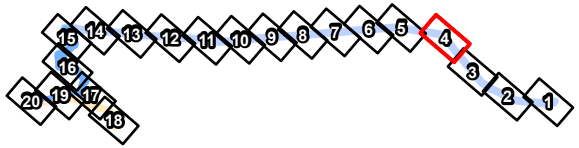

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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FIGURE 5-4

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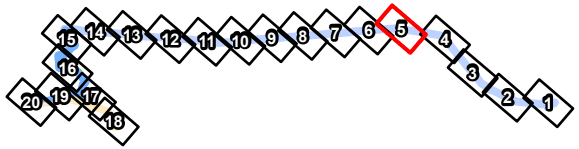

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Grid: GDA 1994 MGA Zone 55

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FIGURE 5-5

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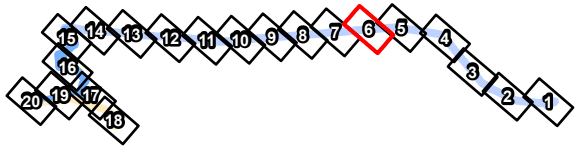

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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FIGURE 5-6

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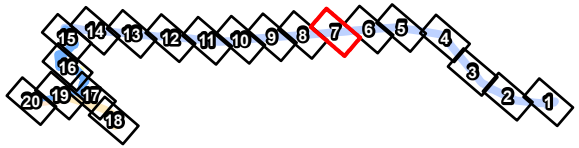

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Grid: GDA 1994 MGA Zone 55

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FIGURE 5-7

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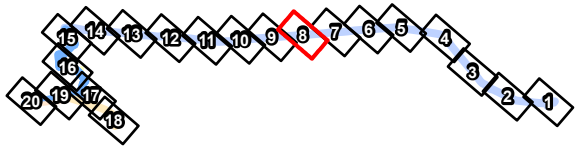

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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FIGURE 5-8

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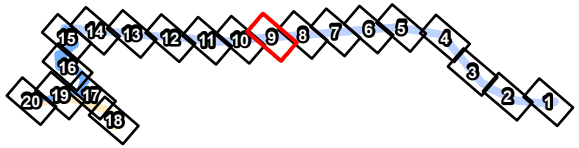

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-9

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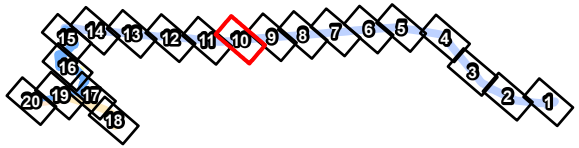

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-10

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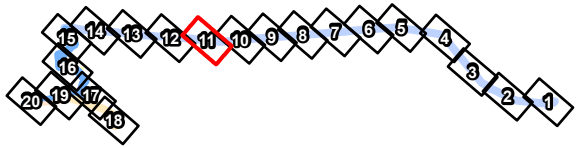

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-11

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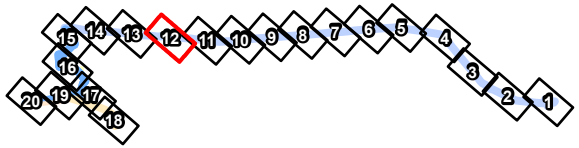

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-12

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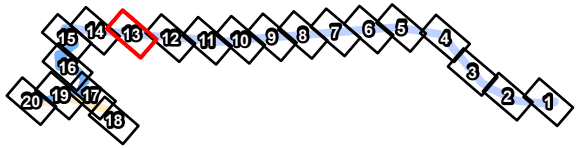

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-13

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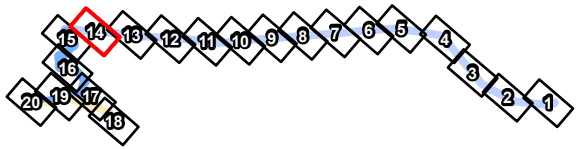

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-14

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Print date: 26 May 2023 - 17:22

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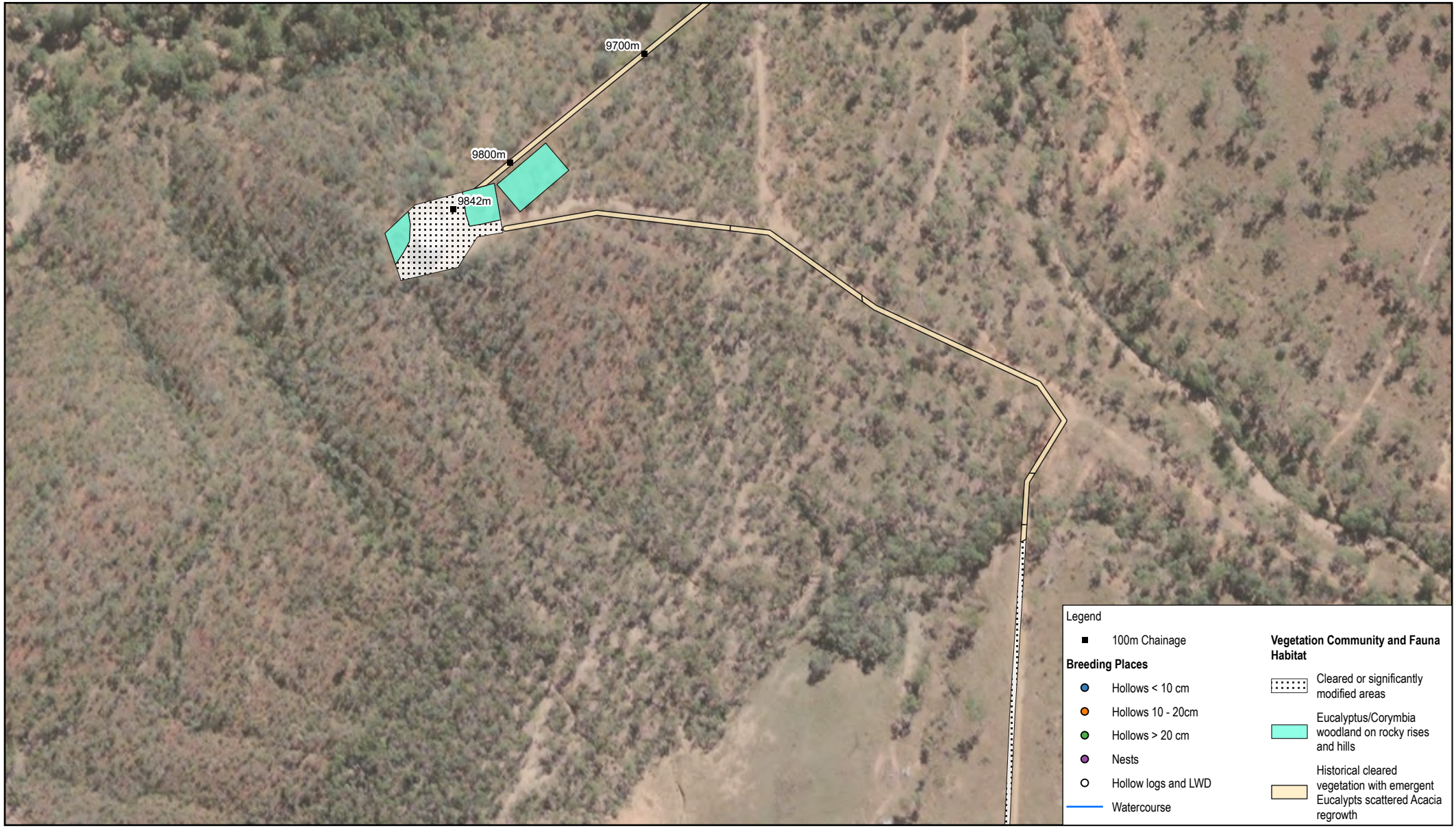

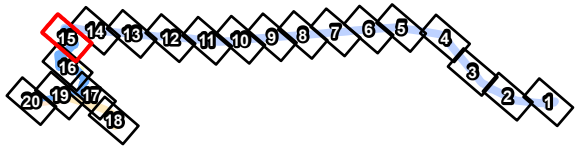

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Field verified vegetation communities and general fauna habitat

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FIGURE 5-15

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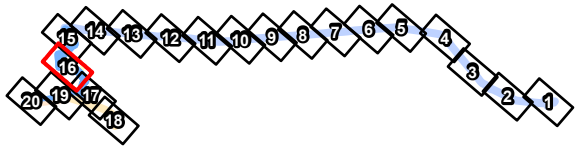

Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-16

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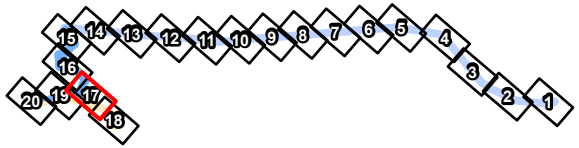

Paper Size ISO A4

0 30 60 90

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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FIGURE 5-17

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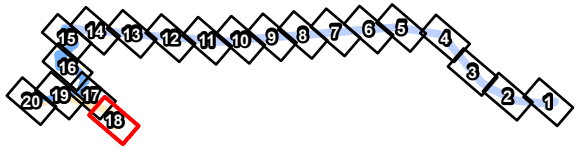
Data source: GHD: Site Layout, Breeding Places, Field Verified Vegetation Communities & Fauna Habitats (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.



Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Field verified vegetation communities and general fauna habitat

Project No. **12547012**
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FIGURE 5-18

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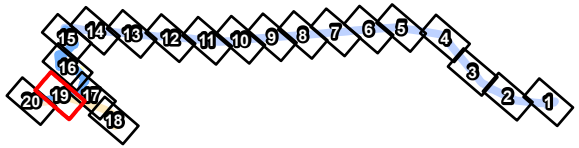

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Map Projection: Universal Transverse Mercator
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Grid: GDA 1994 MGA Zone 55

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Field verified vegetation communities and general fauna habitat

Project No. **12547012**
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FIGURE 5-19

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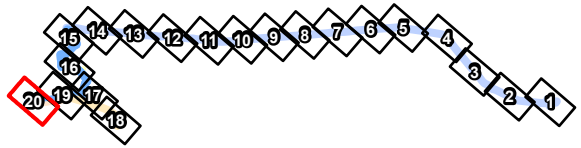
Print date: 26 May 2023 - 17:24

Data source: GHD: Site Layout, Breeding Places, Field Verified Vegetation Communities & Fauna Habitats (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.



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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Field verified vegetation communities and general fauna habitat

Project No. **12547012**
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FIGURE 5-20

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Print date: 26 May 2023 - 17:24

Data source: GHD: Site Layout, Breeding Places, Field Verified Vegetation Communities & Fauna Habitats (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

5.4 Conservation significant flora

No conservation significant flora species listed under the EPBC Act or NC Act were recorded in field surveys of the Initial Works footprint. As the Initial Works footprint was thoroughly traversed and surveyed during the appropriate season for detection of the target species, it can be concluded with a high degree of confidence that no threatened or near threatened plant species 'in the wild' are present.

A likelihood of occurrence was completed for all conservation significant plant species identified in the desktop assessment. One species, *Lepturus minutus* was assessed to be a species that 'may occur' in the Initial Works footprint. No species were assessed to be likely to occur in the Initial Works footprint. The full likelihood of occurrence assessment is provided in Appendix B.

5.5 Conservation significant fauna

No conservation significant terrestrial fauna were confirmed present during field surveys. However habitat that could be utilised by the red goshawk, black-throated finch (southern), squatter pigeon (southern), koala, greater glider (northern), fork-tailed swift and satin flycatcher was identified throughout the Initial Works footprint and surrounding vegetation. The presence of habitat identified from field surveys and historical records within 10 km of the Initial Works footprint has resulted in these species being assessed to be "likely to occur" within the Initial Works footprint. The following sections provide a brief description of each species and the suitability of habitat within the Initial Works footprint. The likelihood of occurrence assessment for all species retrieved from the desktop searches is provided in Appendix B. Seven conservation significant species were assessed as 'may occur' and four migratory species as 'may occur'.

5.5.1 Red goshawk

The red goshawk is listed as endangered under the EPBC Act and the NC Act.

The red goshawk is a large raptor endemic to northern and eastern Australia, occurring throughout coastal and subcoastal Queensland, Cape York and the Kimberly (DCCEEW, 2022a; Menkhorst et al*.,* 2019). The species occurs in lower densities in central and southern Queensland (Czechura et al*.,* 2010); however stronghold populations persist in the Northern Territory and Tiwi Islands (DCCEEW, 2022a; Woinarski et al*.,* 2000). While records are scattered from the QLD-NSW border north to Cape York, the red goshawk has experienced a recent, rapid northward contraction, and is now rarely encountered south of southern Cape York in Queensland (MacColl et al., 2023). However, recent tracking data from Australian Wildlife Conservancy, University of Queensland, Rio Tinto, and the Queensland Department of Environment and Science have recorded an individual of the species flying south of Cape York to arid southwest QLD (AWC, 2022).

As a bird-eating raptor, the red goshawk requires vegetative cover for both roosting and ambush hunting (DCCEEW, 2022a). The species breeds solitarily, in forested or wooded areas, in large trees, often adjacent to or within 1 km of permanent water, usually the tallest in the area (over 20 m tall) (DCCEEW, 2022a). Nest trees are sometimes selected along clearings, but always within 1 km of permanent water (DERM, 2012). Habitats providing appropriate foraging conditions for the species include intact, extensive woodlands and forests with a mosaic of vegetation types that are open enough for fast maneuvering flight (Marchant and Higgins, 1993). Foraging habitats containing permanent water is favoured due the ability to support biologically rich population of birds (Sattler and Williams, 1999). The species generally avoids very open or very densely vegetated habitats but will hunt along ecotones (DERM, 2012). Past studies of the red goshawk in remote areas with rugged terrain and tall, mature vegetation, primarily eucalypt woodlands (Czechura et al., 2010).

The red goshawk was not recorded during field surveys; however, an anecdotal record was reported from a proposed airfield location in the north-west of the Initial Works footprint. A total of 0.12 ha of potential critical nesting habitat for the red goshawk was mapped in tall riparian woodland adjacent to the Burdekin River, (Figure 6). A total of 0.28 ha of potential critical foraging habitat was mapped open woodlands and mature vegetation associated within watercourses (Figure 6). This corresponds to vegetation communities/broad fauna habitat types:

– *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils and plains and low stony rises on downs and
– Freshwater creek lines and drainage lines vegetation communities.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

As the red goshawk occupies a large home range, the species is unlikely to be a permanent occupant of the Initial Works footprint but could utilise the area temporarily for foraging. Regardless, a precautionary approach has been adopted for the Initial Works and the red goshawk was assessed as likely to occur.

Plate 1 Example photos of red goshawk habitat

5.5.2 Black-throated finch (southern)

The black-throated finch (southern) is listed as endangered under the EPBC Act and the NC Act.

The black-throated finch (southern) is a small granivorous bird known to only occur in northern and central Queensland (DCCEEW, 2023c; Menkhorst et. al, 2019), where is known from two general locations: the Townsville and Charters Towers region and in scattered sites in central-eastern Queensland (BTF Recovery Team, 2018). Although once extending to the QLD / NSW border, the species has been extinct in southern Queensland since the 1930s (BTF Recovery Team, 2018; DCCEEW, 2023c). The species requires three key resources within its range: potential nesting trees, grass seeds, and daily access to water (DEWHA, 2009). The species nest within 400 m of permanent water sources (DCCEEW, 2023c) and it is likely that these areas (and the habitat surrounding these) provide refuge for the species during the dry season, especially during drought years (DCCEEW, 2023c). Although the black-throated finch (southern) is thought to be sedentary, some local movements are thought to occur in response to drought conditions (Ley & Cook, 2001).

Preferred habitats for the species represent open, grassy woodlands and forests, typically dominated by *Eucalyptus, Corymbia* and *Melaleuca* spp. (BTF Recovery Team, 2018; Menkhorst et. al, 2019; Pizzey & Knight, 1999). Some of the more common species of eucalypts in woodlands frequented by the subspecies include narrow-leaved ironbark (*E. crebra*), river red gum (*E. camaldulensis*), silver-leaved ironbark (*E. melanophloia*) and Reid River box (*E. brownii*; DCCEEW, 2023c). The species is thought to require a mosaic of different habitats in which it can find seed during the wet season (Mitchell, 1996), with preferred foraging species including sabi grass (*Urochloa mosambicensis**), red natal grass (*Melinis repens**), *Enteropogon acicularis*, native panic (*Panicum decompositum*), hairy panic (*Panicum effusum*), Queensland bluegrass (*Dichanthium sericeum*), love grass (*Eragrostis sororia*) and kangaroo grass (*Themeda triandra*) (Mitchell, 1996; NRA, 2007). Of particular importance are grasses which seed in the early wet season, with a critical foraging resource bottleneck thought to occur in November – December, when existing fallen seed germinates, but new seed has yet to be produced (NRA, 2007). Therefore, presence of grass species which produce seed early in the wet season are likely to be essential for the species (DEWHA, 2009).

The Initial Works footprint is located within the species' known range (DCCEEW, 2023c); however, it is not identified as an important habitat area in the 'Greater Townsville region important areas' map or the 'Whole of range important areas' map for the species (DEWHA, 2009). Regardless, the species has two historical

records within 10 km and five historical records within 50 km of the Initial Works footprint. Large segments of the Greenvale water supply upgrade could provide habitat for the species due to the presence of foraging species, namely *Themeda triandra* (kangaroo grass) and *Melinis repens** (red natal grass) in the ground layer. In particular, the open woodland habitat surrounding the Burdekin River provides opportunity for nesting and as well as foraging habitat due to the presence of foraging resources and permanent water.

The distribution of habitat (foraging and breeding) within the Initial Works footprint is presented Figure 6. A total of 0.12 ha of mature vegetation within 400 m of the Burdekin River corresponding to the Mature *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils or plains and low stony rises on downs vegetation community was mapped as providing potential critical nesting habitat (Plate 2). A total of 0.42 ha of mature vegetation was mapped as providing potential critical foraging habitat. This corresponds to the following mapped vegetation communities:

– Mature *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils or plains and low stony rises on downs.
– Mature *Eucalyptus/Corymbia* woodland on stony rises and hills.
– Mature open woodland vegetation along freshwater creek lines and drainage lines vegetation community.

A total of 3.08 ha of historically cleared vegetation with emergent *Eucalyptus* scattered *Acacia* regrowth vegetation community was mapped as foraging habitat for this species.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

Plate 2 ***Example photos of black-throated finch (southern) habitat***

5.5.3 Squatter pigeon (southern)

The squatter pigeon (southern) is listed as vulnerable under the EPBC Act and NC Act.

Its current distribution extends from central Queensland, west to Longreach and Charleville, and south to New South Wales (TSSC, 2015). The species occurs in remnant and regrowth open forest and woodland dominated by *Eucalyptus*, *Corymbia*, *Acacia* and *Callitris* spp. with tussock grassy understorey with 3 km of water sources (TSSC, 2015). Soils are generally a good predictor of their foraging and breeding habitat, which is generally restricted to well-draining, gravelly, sandy, or loamy soils. These typically have a patchy ground layer composed of native perennial tussock grasses or a mix of native perennial tussock grasses and low shrubs or forbs (Squatter Pigeon Workshop, 2011). Breeding habitats are typically on stony rises within 1 km of permanent water (Squatter Pigeon Workshop, 2011). The subspecies is unlikely to move far from woodland trees which provide protection from predatory birds (Squatter Pigeon Workshop, 2011). Where scattered trees still occur, and the distance of cleared land between remnant trees or patches of habitat does not exceed 100 m, individuals may be found foraging in, or moving across modified or degraded environments (Squatter Pigeon Workshop, 2011).

The distribution of foraging habitat within the Initial Works footprint is presented in Figure 6. No nesting habitat was identified within or immediately adjacent to the Initial Works footprint. A total of 0.42 ha of foraging habitat that was assessed to be ‘habitat critical to the survival of the species’ is mapped within the mature woodland habitat which corresponds to the following field validated vegetation communities (Plate 3):

– Mature *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils or plains and low stony rises on downs.
– Mature *Eucalyptus/Corymbia* woodland on stony rises and hills.
– Mature open woodland vegetation along freshwater creek lines and drainage lines vegetation communities.

A total of 3.08 ha of historically cleared vegetation with emergent *Eucalyptus,* and scattered *Acacia* regrowth was mapped as foraging habitat for this species.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

Plate 3 ***Example photos ofsquatter pigeon (southern) habitat***

5.5.4 Koala

The koala is listed as endangered under the EPBC Act and NC Act.

In Queensland, the koala is widely distributed along the east coast, from Cairns in the north, to the QLD border in the south (DCCEEW, 2022b; DCCEEW, 2022g). Throughout its distribution, the koala occurs within dry Eucalypt woodlands and open forests (Melzer & Houston, 2018; DCCEEW, 2022g). The local koala population represents an inland koala population, which include populations in areas receiving annual rainfall of less than 800 mm (Lucky Springs, station ID: 30115 – 695 mm; Greenvale Township, station ID: 32122 – 633 mm; Christmas Creek, station ID: 32104 – 643 mm) (BoM, 2022b). The koala is regarded as a specialist feeder, feeding exclusively on the leaves of various *Eucalyptus, Corymbia, Lophostemon, Angophora* and *Melaleuca* species (Martin & Handasyde, 1999). Under the Commonwealth Guidelines, koala habitat is defined as 'any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees' (DCCEEW, 2022g). This is inclusive of both remnant and non-remnant vegetation throughout natural, agricultural, urban and peri-urban environments, and regardless of whether the species is recorded to be present (DCCEEW, 2022g). The current Commonwealth listing advice states there is currently insufficient information to reliably define habitat critical to the survival of the koala across its' range. However, habitat critical to the survival of the species is likely to include habitat that is used during times of stress, used to meet essential life cycle requirements, used by important populations, necessary for maintaining genetic diversity or allowing movement along corridors, necessary for the long-term survival of the species. In this context, riparian woodland within 250 m of the Burdekin River have been considered habitat critical to the survival of the species, as these areas would be important for movement of koalas and provide local refuge during times of drought.

The species food tree preference is known to vary with locality, with koalas exhibiting foraging preference towards the tree species with the highly nutritional content. Within drier regions of central and northern Queensland, forest red gum (*Eucalyptus tereticornis*) and narrow-leaved ironbark (*E. crebra*) are regarded as the species' key feed trees (Ellis et. al., 2018). On average, the species consumes 500 g of leaves per day and can obtain approximately 50% of their water requirements from their food. Therefore, areas with high moisture availability (i.e. riparian woodlands) provide optimal habitat for the species, particularly in arid regions. Key threats include habitat loss and fragmentation, dog attacks, vehicle strikes, disease and drought (DCCEEW, 2022g).

The distribution of koala habitat present within the Initial Works footprint is mapped in Figure 6. A total of 0.23 ha of potential habitat critical to the survival of the species was mapped within remnant vegetation

within 250 m of the Burdekin River as a permanent water source. All remaining areas of vegetation communities except for the cleared or significantly modified areas community within the Initial Works footprint provide 3.38 ha of habitat for this species (Plate 4). These areas supported preferred foraging vegetation for the koala including *E. crebra*, *E. persistens, E. platyphylla* and *C. dallachiana*.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

Plate 4 Example photos of koala habitat

5.5.5 Greater glider (northern)

The greater glider (northern) is listed as vulnerable under the EPBC Act and NC Act.

The greater glider (northern) is found inland from Mackay to Hughenden through to Cooktown in Queensland in the Einasleigh Uplands (DCCEEW, 2022h). The species is restricted to eucalypt forests and woodlands, typically occurring in highest abundance in taller, montane, moist eucalypt forests with an abundance of mature, hollow-bearing trees (Eyre, 2004; van der Ree et. al., 2004; Vanderduys et. al., 2012). The species are highly adapted to the Australian environment and display high levels of dietary specificity, feeding almost exclusively on leaves of the Eucalypt genus (Kehl & Borsboom, 1984; van der Ree et. al., 2004). The species displays strong seasonal food preferences, and therefore, favours forests that contain a diversity of eucalypt tree species and provides consistent access to foraging habitat throughout the year (Kavanagh, 1984). The species utilises tree hollows as diurnal refuges and breeding habitat (Kehl & Borsboom, 1984; Lindenmayer et. al., 1991; Smith et. al., 2007; Goldingay, 2012) and therefore, the availability of mature hollow-bearing trees appears to be a limiting factor for the species. Given the species' limited capacity for dispersal, and reluctance to cross vegetation gaps, the species is highly sensitive to habitat fragmentation (Lindenmayer et. al., 2000; Eyre, 2006; Taylor & Goldingay, 2009). Greater gliders are generally unlikely to persist in small forest remnants, with modelling suggesting the species requires patches of remnant forest that are at least 160 km^2 (16,000 ha) (Eyre, 2002).

The distribution of greater glider (northern) habitat within the Initial Works footprint is presented in Figure 6. A total of 0.39 ha habitat was observed within mature *Eucalyptus* and *Corymbia* open woodland dominated by *E. persistens and C. dallachiana* due to the high abundance of suitable hollows (Plate 5). This corresponds to the *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils and plains and low stony rises on downs and freshwater creek lines and drainage lines vegetation communities (Table 21).

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

Plate 5 ***Example photos of greater glider (northern) habitat***

5.5.6 Fork-tailed swift

The fork-tailed swift is listed as migratory under the EPBC Act and special least concern under the NC Act.

The fork-tailed swift is exclusively aerial, occurring at altitudes between 1 m and 300 m, and occurs over a wide range of habitats in both inland and coastal areas (Menkhorst et al., 2019). The fork-tailed swift is mostly found above dry and open habitats including riparian woodland, salt marshes, grasslands, sand plains and farmland (DCCEEW, 2022h). They are sometimes recorded above wetter habitats including rainforest, wet sclerophyll and pine plantations (Higgins, 1999). The species typically forages aerially, using low pressure systems to assist their movement. Birds are sometimes observed at canopy level within open forests (Higgins, 1999).

The fork-tailed swift was recorded on two occasions within the GVTA Main Works project area at Jack's Hill Gorge. The species may forage over remnant vegetation and surrounding watercourses within the Initial Works footprint. An estimated 0.28 ha of habitat for the species within *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils and plains and low stony rises on downs and freshwater creek lines and drainage lines vegetation communities occurs within the Initial Works footprint. Habitat in the Initial Works footprint would contributes to the wider available habitat of the species under the correct climatic and seasonal conditions due to local records, open woodland habitat and the Initial Works being located within this species distribution. The distribution of habitat for the species is presented in Figure 6.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.

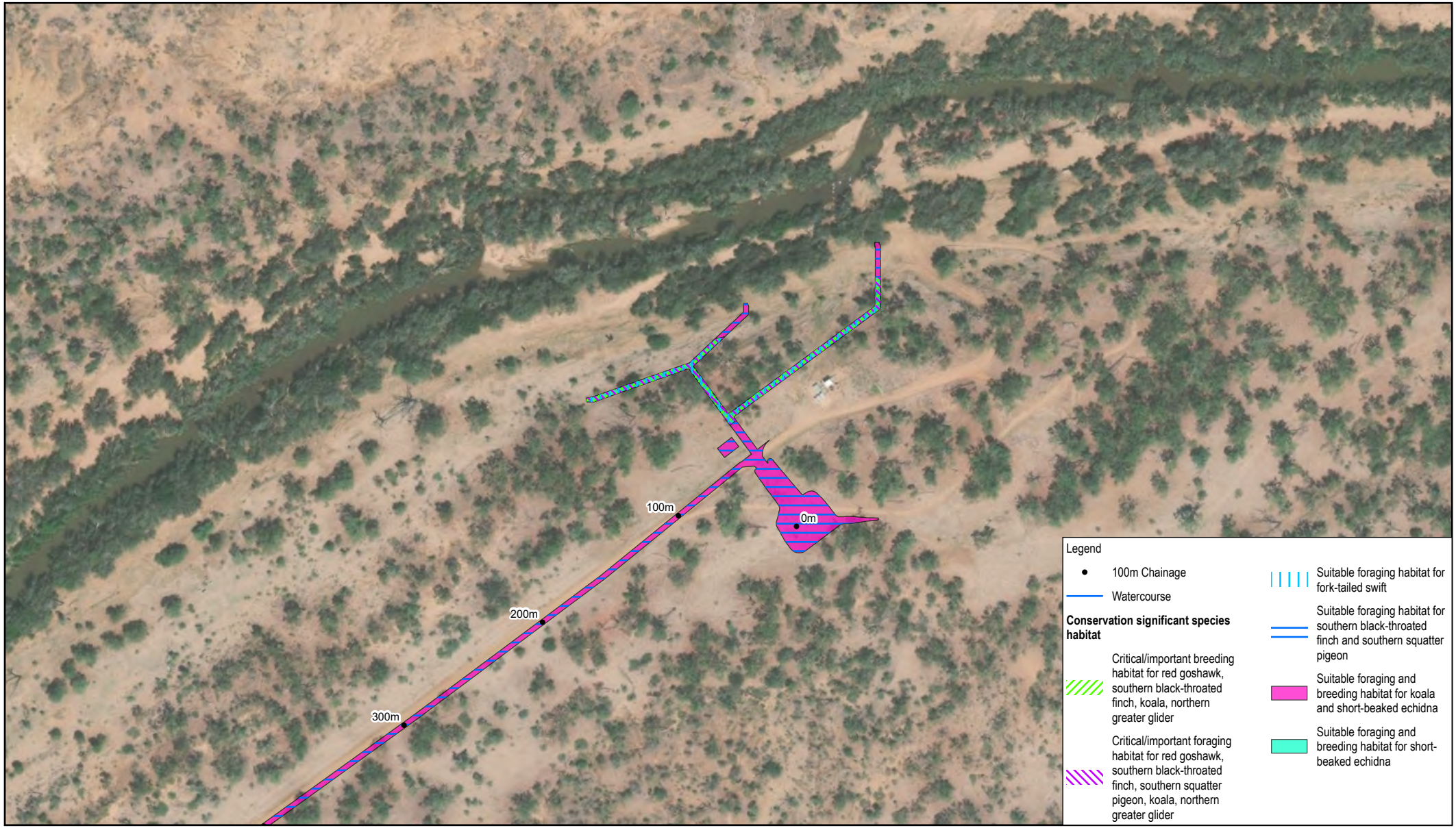
5.5.7 Satin flycatcher

The satin flycatcher is listed as migratory under the EPBC Act and special least concern under the NC Act.

The satin flycatcher has a broad distribution, occurring widely throughout the east coast of the Australian mainland and Tasmania (Menkhorst et al., 2019; Pizzey & Knight, 1999). The species migrates annually, spending spring and summer in south-eastern Australia and migrating to northern Australia and Papua New Guinea in the winter months (Blakers et al., 1984). The species occurs in a range of habitats, predominantly favouring heavily vegetated gullies associated with wetlands and watercourses in wet sclerophyll woodland (Menkhorst et al., 2019). During migration the species occurs in a broader range of habitats including coastal forests, woodlands, mangroves and drier woodlands and forests (Blakers et al., 1984). In northern and central Queensland, the species is considered an infrequent passage migrant (Menkhorst et al., 2019).

The satin flycatcher has been previously recorded within the GVTA Main Works project area during the 2019 field surveys, where the species was recorded at Jack's Hill Gorge. Watercourses provide important foraging habitat for the species. A total of 0.04 ha of important foraging habitat has been mapped within the freshwater creek lines and drainage lines vegetation community. The distribution of habitat for the species is presented in Figure 6.

A detailed description of the habitat mapping criteria for this species is provided in Appendix C.



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Grid: GDA 1994 MGA Zone 55

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Conservation significant species habitat

FIGURE 6-1

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Date **26 May 2023**

Conservation significant species habitat

FIGURE 6-2

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Conservation significant species habitat

FIGURE 6-3

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Conservation significant species habitat

FIGURE 6-4

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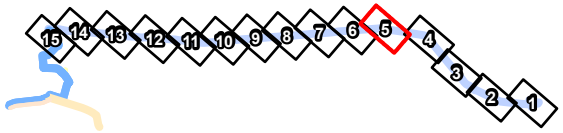

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Project No. **12547012**
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FIGURE 6-5

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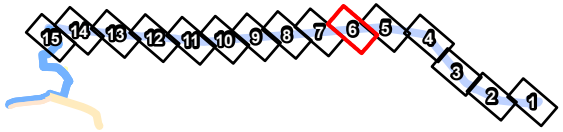

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Conservation significant species habitat

Project No. **12547012**
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Date **26 May 2023**

FIGURE 6-6

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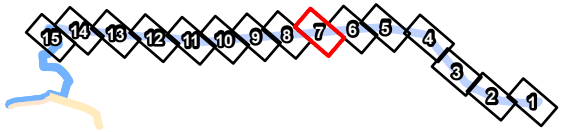

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Grid: GDA 1994 MGA Zone 55

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Conservation significant species habitat

FIGURE 6-7

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Print date: 26 May 2023 - 17:05

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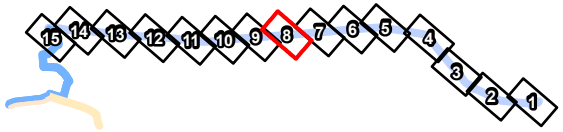

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Department of Defence
ASMTI Greenvale Initial Works

Conservation significant species habitat

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

FIGURE 6-8

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Data source: GHD: Site Layout (2022), Conservation significant species habitat (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

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Map Projection: Universal Transverse Mercator
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ASMTI Greenvale Initial Works

Conservation significant species habitat

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

FIGURE 6-9

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Print date: 26 May 2023 - 17:06

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Conservation significant species habitat

Project No. **12547012**
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Date **26 May 2023**

FIGURE 6-10

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Print date: 26 May 2023 - 17:06

Data source: GHD: Site Layout (2022), Conservation significant species habitat (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

Paper Size ISO A4

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

Conservation significant species habitat

FIGURE 6-11

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Print date: 26 May 2023 - 17:06

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Revision No. **C**
Date **26 May 2023**

Conservation significant species habitat

FIGURE 6-12

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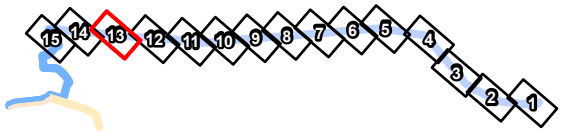

Paper Size ISO A4

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Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Department of Defence
ASMTI Greenvale Initial Works

Conservation significant species habitat

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

FIGURE 6-13

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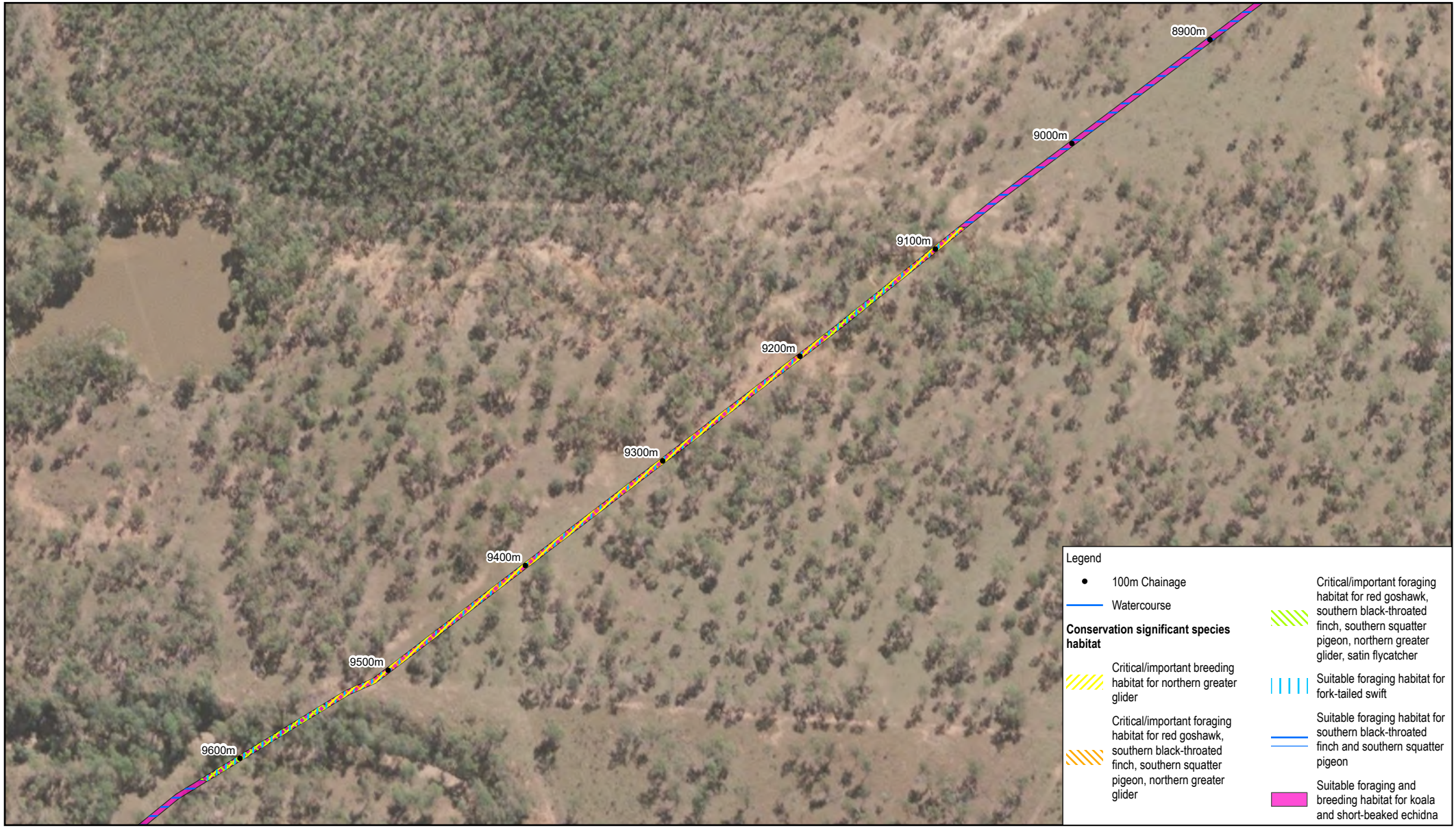
Print date: 26 May 2023 - 17:07

Data source: GHD: Site Layout (2022), Conservation significant species habitat (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.



Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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ASMTI Greenvale Initial Works

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

Conservation significant species habitat

FIGURE 6-14

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Print date: 26 May 2023 - 17:07

Data source: GHD: Site Layout (2022), Conservation significant species habitat (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

Paper Size ISO A4

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Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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Department of Defence
ASMTI Greenvale Initial Works

Project No. **12547012**
Revision No. **C**
Date **26 May 2023**

Conservation significant species habitat

FIGURE 6-15

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Print date: 26 May 2023 - 17:08

Data source: GHD: Site Layout (2022), Conservation significant species habitat (2023); DoR: Road (2019), Watercourse (2019), Town (2021);World Imagery: Maxar.

5.6 Aquatic habitat

The Bioassessment score for the Burdekin River conducted during the field survey is shown in Table 21. Site characteristics and ecological values are summarised in Table 22.

Table 21 Bioassessment score of the Burdekin River

Habitat variable	Scale	Burdekin RIver
Bottom substrate	0-20	3
Embeddedness	0-20	2
Velocity and depth category	0-20	8
Channel alteration	0-15	5
Bottom scouring and deposition	0-15	14
Pool/riffle, run/bend ratio	0-15	1
Bank stability	0-10	7
Bank vegetation and stability	0-10	9
Streamside cover	0-10	9
Totals	**0-135**	**58**
Habitat score category		**Fair**

Key to table	Poor	Fair	Good	Excellent

Table 22 Aquatic habitat assessment of the Burdekin River

Site	Characteristics	Ecological values
Burdekin River		
Upstream 	– Major risk (purple) waterway mapped under the Waterway Barrier Works (WWBW) spatial layer. – Mildly sinuous permanent river channel with flow including runs and extended connecting pool sections. – Extensive bar formation containing mature *Melaleuca leucadendra.* – Log piles and single branches and logs common in-stream. – Highly turbid water, the depth could not be determined. Wetted width 60 m. – Left bank steep with a wide lower bench. Right bank has a softer gradient of low to moderate. – Continuous riparian vegetation along banks consists of mature *M. leucadendra* and a mixed native and introduced mixed grassy understory. – Overhanging canopy cover and trailing bank vegetation at 75 %. – Observable substrate consisting of silt and sand. – Both banks highly stable due to the high coverage of *M. leucadendra* with only some local erosion at entry point to the bore due to frequent use from pigs and cattle. – Localised and upstream land use cattle grazing.	– Overall habitat rating condition was fair (58). – Habitat types included runs and connected pools. – Instream habitat consisted of log piles, individual logs and branches and trailing bank vegetation. – Macrophyte species *Cyperus* spp. found along banks. – Abundant overhanging canopy and trailing vegetation from continuous *M. leucadendra* along the banks. – Sandy/silty banks suitable for burrowing. – Permanent drinking water source for terrestrial fauna. – Site provides habitat for freshwater turtle species.
Downstream 		

5.7 Conservation significant aquatic fauna

The DCCEEW PMST and Wildlife Online (WO) searches did not identify any threatened aquatic species within the Initial Works footprint.

5.8 Potential breeding places

Almost all native and introduced vegetation within the Initial Works footprint and surrounds provides microhabitat features (woody vegetation at different strata, ground cover, large woody debris litter and soils) that contribute to the breeding, shelter and roosting habitat for fauna. In general, key active, potential or significant habitat features encountered included:

- Mature eucalypt woodlands with abundant hollows of a range of sizes (<10 cm to 30 cm) which provide breeding habitat for hollow-nesting birds including parrots and cockatoos; denning mammals including greater gliders, gliders, possums and microbats and refuge seeking reptiles including geckoes, lizards, skinks and snakes. These woodlands also provide nesting habitat for large avifauna (i.e. eagles, kites and falcons) in the upper branches of the taller trees and nesting habitat for smaller avifauna (e.g. fairy wrens and robins) in the shrub layer and midstorey vegetation (Plate 6).
- Permanent and ephemeral waterbodies and drainage lines that provide habitat for amphibians, aquatic reptiles, fish, and migratory birds.
- Abandoned arboreal termite mounds that facilitate nesting woodland birds.
- Hollow logs, log and branch piles and rock piles providing shelter and breeding habitat for snakes, lizards, geckoes and ground dwelling mammals including bandicoots, rats and echidnas (Plate 6).

The most common potential breeding place type that intersects the Initial Works footprint and has the potential to be impacted by the works, are hollow bearing trees. This is because two of the most common tree species present in the Initial Works footprint are *Eucalyptus persistens* and *Corymbia dallachiana* which commonly hollow out as they age. Each potential breeding place has been described and GPS marked.

Plate 6 ***Potential breeding places within the Initial Works footprint***

5.9 Biosecurity matters

During the field surveys introduced species were observed as being generally localised to watercourses, particularly the Burdekin River, and disturbed areas such as roadsides, areas subject to cattle grazing and historically cleared areas (non-remnant). A total of two introduced mammals, one amphibian and four introduced flora species were confirmed from surveys and are described below (Table 23).

Table 23 ***Introduced species identified from field surveys***

Species	Listed under the Commonwealth WoNS list	Listing category under the Biosecurity Act	Recorded in the Initial Works footprint
Mammal			
Canis familiaris Feral dog	N/A	Restricted 3, 4 and 6	One observed near the watercourse that crosses the powerline easement from the water tank
Sus scrofa Feral pig	N/A	Restricted 3, 4 and 6	One boar observed along the Greenvale water supply upgrade pipeline
Amphibian			
Rhinella marina Cane toad	N/A	General biosecurity obligation	Observed throughout the Initial Works footprint near watercourses
Flora			
Cascabela thevetia Yellow oleander	No	Restricted 3	Observed in low densities scattered along the Greenvale water supply upgrade
Opuntia stricta	Yes	Restricted 3	Scattered throughout the Initial Works footprint in a very low density, particularly in non-remnant areas.

Species	Listed under the Commonwealth WoNS list	Listing category under the Biosecurity Act	Recorded in the Initial Works footprint
Opuntia tomentosa	Yes	Restricted 3	Scattered throughout the Initial Works footprint in a very low density, particularly in non-remnant areas.
Vachellia farnesiana Prickly acacia	No	Restricted 3	Observed in low densities scattered along the Greenvale water supply upgrade

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Appendices

Appendix A

Environmental desktop assessment

EPBC Act Protected Matters Report

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

Report created: 01-Dec-2022

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	20
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrura gouldiae Gouldian Finch [413]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area	In feature area
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mesembriomys gouldii rattoides			
Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides minor			
Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat may occur within area	In feature area
Rhinolophus robertsi			
Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Saccolaimus saccolaimus nudicluniatus			
Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acacia crombiei			
Pink Gidgee [10927]	Vulnerable	Species or species habitat may occur within area	In feature area
Cycas platyphylla			
a cycad [55796]	Vulnerable	Species or species habitat may occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tephrosia leveillei			
[16946]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
REPTILE			
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

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

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Powerlink Queensland Genex Kidston Connection Project	2021/9060		Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
NORNICO Tri-Metal Project, Qld	2012/6304	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

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

Report created: 01-Dec-2022

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	20
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

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

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrura gouldiae Gouldian Finch [413]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area	In feature area
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mesembriomys gouldii rattoides			
Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides minor			
Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat may occur within area	In feature area
Rhinolophus robertsi			
Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Saccolaimus saccolaimus nudicluniatus			
Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acacia crombiei			
Pink Gidgee [10927]	Vulnerable	Species or species habitat may occur within area	In feature area
Cycas platyphylla			
a cycad [55796]	Vulnerable	Species or species habitat may occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tephrosia leveillei			
[16946]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
REPTILE			
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundo rustica](#) Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Poison Lake	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Powerlink Queensland Genex Kidston Connection Project	2021/9060		Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
NORNICO Tri-Metal Project, Qld	2012/6304	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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Queensland Government

Department of Environment and Science

Environmental Reports

Regional Ecosystems

Biodiversity Status

For the selected area of interest
Custom Geometry

Environmental Reports - General Information

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

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

Figures in tables may be affected by rounding.

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

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

Important Note to User

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

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

Please direct queries about these reports to: Queensland.Herbarium@qld.gov.au

Disclaimer

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.

Table of Contents

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: Custom Geometry

Size (ha)	57.65
Local Government(s)	Charters Towers Regional
Bioregion(s)	Einasleigh Uplands
Subregion(s)	Broken River
Catchment(s)	Burdekin

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	23.25	40.34
No concern at present	21.54	37.36
Total remnant vegetation	44.79	77.69

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

Regional Ecosystems

1. Introduction

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

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

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

https://www.resources.qld.gov.au/

With respect to the Queensland Biodiversity Status,

"Endangered" regional ecosystems are described as those where:

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

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

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

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

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

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

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

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

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

2. Remnant Regional Ecosystems

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

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

Regional Ecosystem	Short Description	BD Status	Area (Ha)	% of AOI
9.11.2a	Eucalyptus crebra (or several other ironbark species) +/- Corymbia spp. woodland on shallow texture contrast soils on low metamorphic hills and lowlands	No concern at present	2.53	4.38
9.11.2d	Eucalyptus crebra (or several other ironbark species) +/- Corymbia spp. woodland on shallow texture contrast soils on low metamorphic hills and lowlands	No concern at present	0.73	1.27
9.11.5	Eucalyptus persistens +/- E. crebra woodland on low metamorphic hills	No concern at present	4.01	6.96
9.3.1	Eucalyptus camaldulensis and/or E. tereticornis +/- Melaleuca spp. +/- Casuarina cunninghamiana fringing woodland on channels and levees	Of concern	0.49	0.85
9.3.12a	River beds and associated waterholes on major rivers and channels	Of concern	0.01	0.02
9.3.16	Eucalyptus tereticornis and/or E. platyphylla and/or Corymbia clarksoniana woodland on alluvial flats, levees and plains	Of concern	2.92	5.07
9.3.22a	Eucalyptus crebra or E. cullenii +/- Corymbia spp. open woodland on alluvial levees and terraces	Of concern	10.57	18.33
9.3.3a	Corymbia spp. and Eucalyptus spp. dominated mixed woodland on alluvial flats, levees and plains	Of concern	8.77	15.21
9.3.3b	Corymbia spp. and Eucalyptus spp. dominated mixed woodland on alluvial flats, levees and plains	Of concern	0.49	0.85
9.3.6a	Eucalyptus platyphylla +/- Eucalyptus spp. +/- Corymbia spp. woodland on alluvial plains	No concern at present	8.77	15.21
9.5.11	Eucalyptus persistens +/- E. crebra woodland on flats on Tertiary remnant plains	No concern at present	2.37	4.1
9.7.1a	Eucalyptus persistens woodland on lateritised and deeply weathered surfaces on undulating terrain	No concern at present	0.17	0.3
9.7.1b	Eucalyptus persistens woodland on lateritised and deeply weathered surfaces on undulating terrain	No concern at present	2.92	5.07
9.7.3c	Eucalyptus crebra or E. portuensis +/- Corymbia clarksoniana woodland on lateritised surfaces and edges of Tertiary surfaces	No concern at present	0.04	0.07
non-remnant	None	None	12.86	22.31

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
9.11.2a	Pre-clearing 359000 ha; Remnant 2019 353000 ha	13c	Not a Wetland	Low
9.11.2d	Pre-clearing 359000 ha; Remnant 2019 353000 ha	13c	Not a Wetland	Low
9.11.5	Pre-clearing 389000 ha; Remnant 2019 386000 ha	19d	Not a Wetland	Low
9.3.1	Pre-clearing 100000 ha; Remnant 2019 98000 ha	16a	Riverine	Low
9.3.12a	Pre-clearing 65000 ha; Remnant 2019 64000 ha	16d	Riverine	Low
9.3.16	Pre-clearing 33000 ha; Remnant 2019 29000 ha	16c	Not a Wetland	Low
9.3.22a	Pre-clearing 99000 ha; Remnant 2019 96000 ha	16c	Not a Wetland	Low
9.3.3a	Pre-clearing 151000 ha; Remnant 2019 131000 ha	16b	Not a Wetland	Low
9.3.3b	Pre-clearing 151000 ha; Remnant 2019 131000 ha	16b	Not a Wetland	Low
9.3.6a	Pre-clearing 20000 ha; Remnant 2019 19000 ha	16c	Contains Palustrine	Medium
9.5.11	Pre-clearing 52000 ha; Remnant 2019 52000 ha	19d	Not a Wetland	Low
9.7.1a	Pre-clearing 90000 ha; Remnant 2019 88000 ha	19d	Not a Wetland	High
9.7.1b	Pre-clearing 90000 ha; Remnant 2019 88000 ha	21b	Not a Wetland	High
9.7.3c	Pre-clearing 42000 ha; Remnant 2019 42000 ha	12b	Not a Wetland	High
non-remnant	None	None	None	None

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

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

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

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

Regional Ecosystem	Special Values
9.11.2a	Potential habitat for NCA listed species: Corchorus subargenteus, Cycas couttsiana, Cycas platyphylla, Eucalyptus paedoglauca, Grevillea glossadenia
9.11.2d	Potential habitat for NCA listed species: Corchorus subargenteus, Cycas couttsiana, Cycas platyphylla, Eucalyptus paedoglauca, Grevillea glossadenia
9.11.5	Potential habitat for NCA listed species: Leptospermum pallidum, Lepturus minutus
9.3.1	Significant habitat as drought refuge, wildlife corridors and for arboreal animals.
9.3.12a	Significant habitat as drought refuge, wildlife corridors and for arboreal animals.
9.3.16	Significant habitat as drought refuge, wildlife corridors and for arboreal animals.
9.3.22a	Potential habitat for NCA listed species: Macropteranthes montana
9.3.3a	Significant habitat as drought refuge, wildlife corridors and for arboreal animals.
9.3.3b	Significant habitat as drought refuge, wildlife corridors and for arboreal animals.
9.3.6a	Includes seasonal wetlands important for water bird feeding. 9.3.6a: Includes seasonal wetlands important for water bird feeding.
9.5.11	None
9.7.1a	Habitat for the near threatened plant species Leptospermum pallidum near Poison Lake.
9.7.1b	Habitat for the near threatened plant species Leptospermum pallidum near Poison Lake.
9.7.3c	None
non-remnant	None

3. Remnant Regional Ecosystems by Broad Vegetation Group

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

A comprehensive description of BVGs is available at:

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

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

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

BVG (1 Million)	Description	Area (Ha)	% of AOI
None	None	12.86	22.31
12b	Woodlands and open woodlands dominated by Eucalyptus crebra (sens. lat) (narrow-leaved red ironbark) and/or Corymbia spp. such as C. clarksoniana (grey bloodwood), C. stockeri, C. setosa (rough leaved bloodwood) or C. peltata (yellowjacket) on hilly terrain. (land zones 7, 10, 11) (GUP, EIU, DEU, CYP)	0.04	0.07

BVG (1 Million)	Description	Area (Ha)	% of AOI
13c	Woodlands of Eucalyptus crebra (sens. lat.) (narrow-leaved red ironbark), E. drepanophylla (grey ironbark), E. fibrosa (dusky-leaved ironbark), E. shirleyi (shirley's silver-leaved ironbark) on granitic and metamorphic ranges (land zones 12, 11, 9, [5]) (BRB, EIU, SEQ, NET, CQC)	3.26	5.65
16a	Open forest and woodlands dominated by Eucalyptus camaldulensis (river red gum) (or E. tereticornis (blue gum)) and/or E. coolabah (coolabah) (or E. microtheca (coolabah)) fringing drainage lines. Associated species may include Melaleuca spp., Corymbia tessellaris (carbeen), Angophora spp., Casuarina cunninghamiana (riveroak). Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (MGD, BRB, GUP, CHC, MUL, DEU, EIU, NWH, SEQ, [NET, WET]) (All bioregions except CYP and CQC)	0.49	0.85
16b	Woodlands dominated by Eucalyptus leptophleba (Molloy red box), with Corymbia tessellaris (carbeen) or C. clarksoniana (grey bloodwood) or C. dallachiana. On sandy levees. (land zones 3, 5) (GUP, EIU, CYP)	9.26	16.06
16c	Woodlands and open woodlands dominated by Eucalyptus coolabah (coolabah) or E. microtheca (coolabah) or E. largiflorens (black box) or E. tereticornis (blue gum) or E. chlorophylla on floodplains. Does not include alluvial areas dominated by herb and grasslands or alluvial plains that are not flooded. (land zone 3) (All bioregions except WET, principally GUP, BRB, MUL).	22.26	38.61
16d	River beds, open water or sand, or rock, frequently unvegetated. (land zone 3) (GUP, EIU, BRB, CYP, DEU, [CQC, MUL])	0.01	0.02
19d	Low open woodlands dominated by Eucalyptus persistens (or E. normantonensis (Normanton box), E. tardecidens, E. provecta) with Triodia spp. dominated ground layer, mainly on hills and ranges. (land zones 7, 11, 12, 5, [4, 10]) (EIU, MGD, CHC, BRB, GUP, DEU)	6.55	11.36
21b	Low open woodlands and tall shrublands of Melaleuca citrolens or M. stenostachya or other Melaleuca spp. (land zones 5, 3, 7, 10, 11, 12) (GUP, CYP, EIU, DEU, BRB, [SEQ])	2.92	5.07

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/

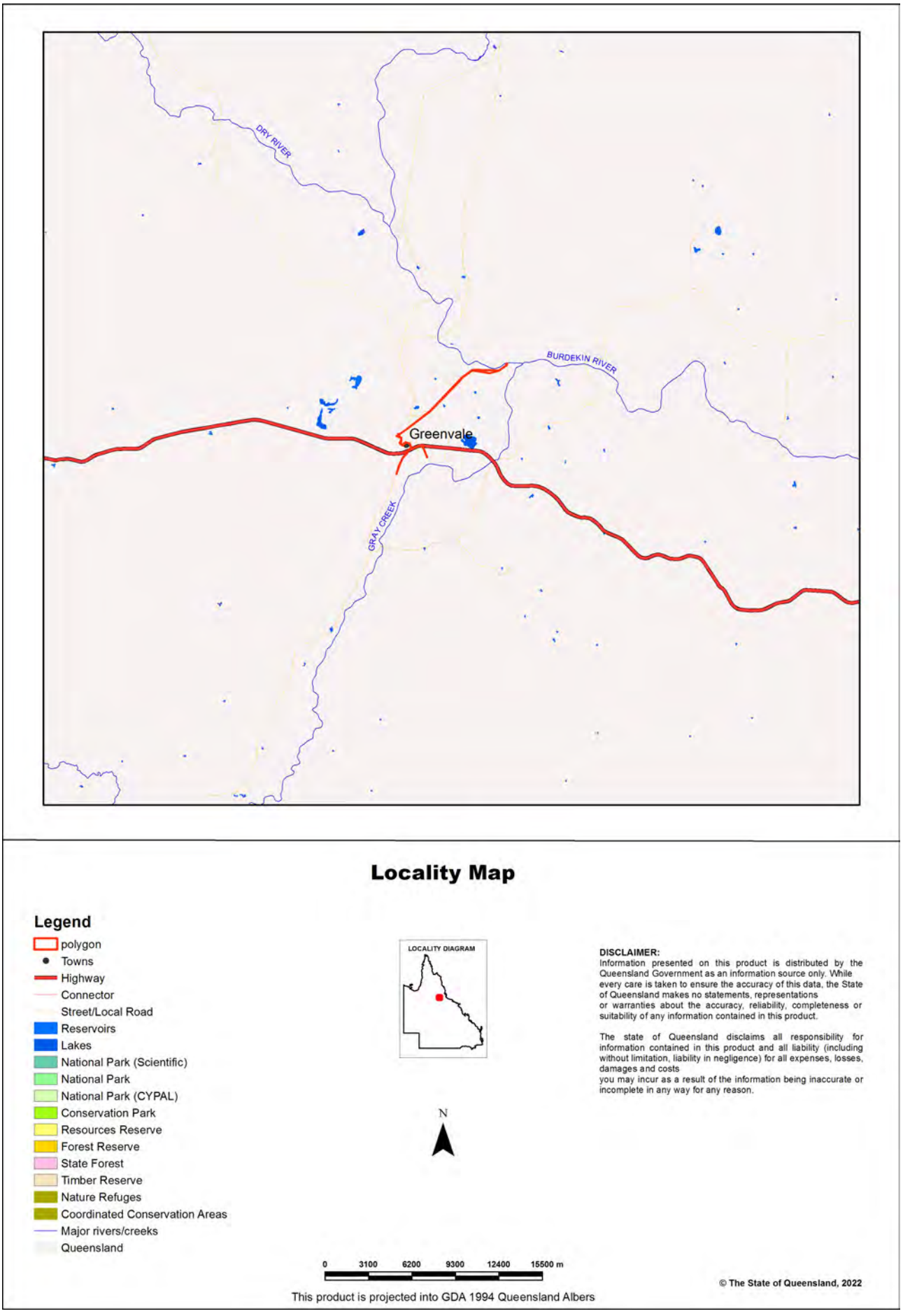
Benchmarks are based on a combination of quantitative and qualitative information and should be used as a guide only. Benchmarks are specific to one regional ecosystem vegetation community, however, the natural variability in structure and floristic composition under a range of climatic and natural disturbance 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

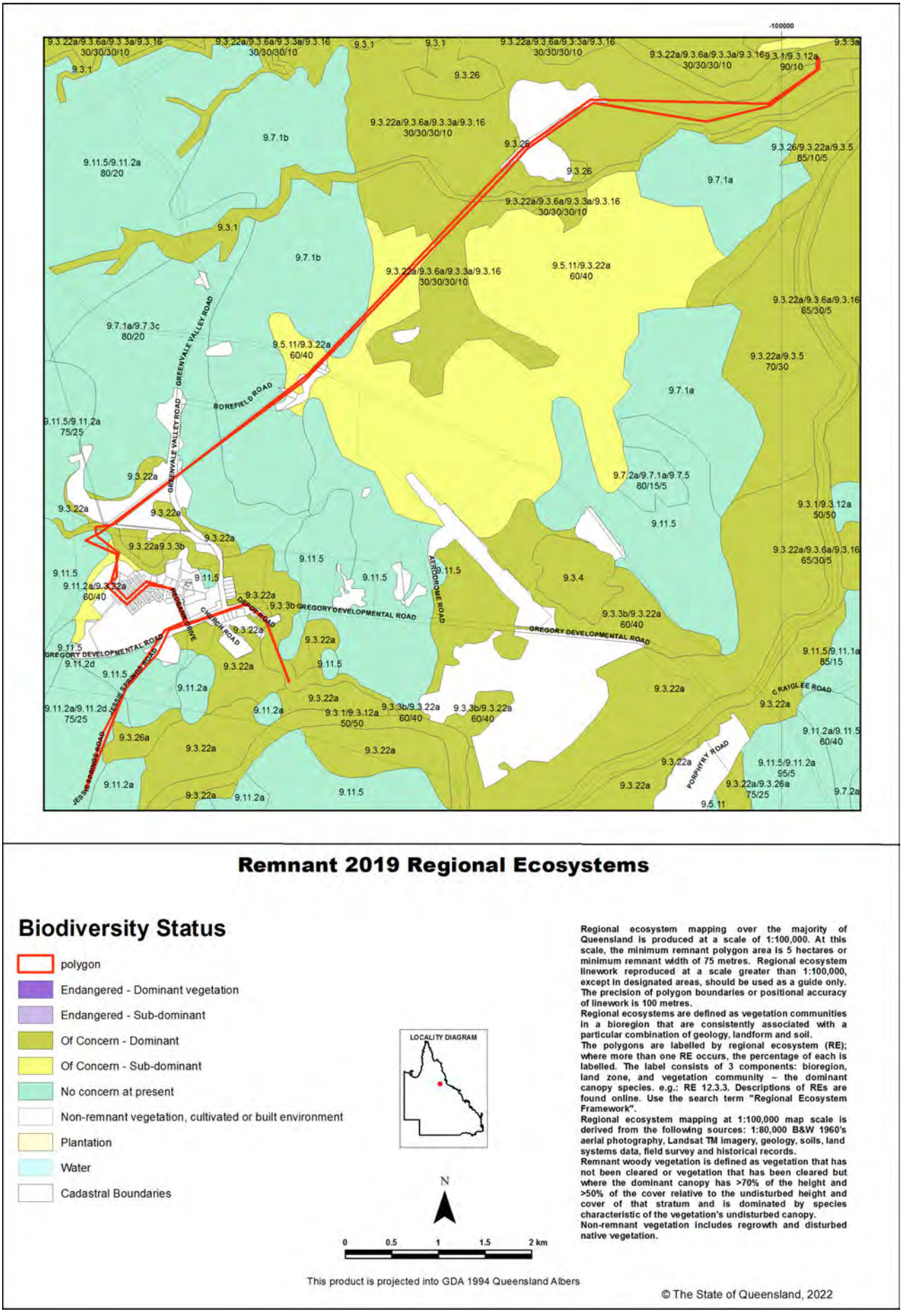
Regional ecosystems mapped as within the AOI	Technical Descriptions	Biocondition Benchmarks
9.11.2a	Available	Not currently available
9.11.2d	Available	Not currently available
9.11.5	Available	Not currently available
9.3.1	Available	Not currently available
9.3.12a	Available	Not currently available
9.3.16	Available	Not currently available
9.3.22a	Available	Not currently available
9.3.3a	Available	Not currently available
9.3.3b	Available	Not currently available
9.3.6a	Available	Not currently available
9.5.11	Available	Not currently available
9.7.1a	Available	Not currently available
9.7.1b	Available	Not currently available
9.7.3c	Not currently available	Not currently available
non-remnant	Not currently available	Not currently available

Maps

Map 1 - Location



Map 2 - Remnant 2019 regional ecosystems



Remnant 2019 Regional Ecosystems

Biodiversity Status

- polygon
- 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

N

0 0.5 1 1.5 2 km

This product is projected into GDA 1994 Queensland Albers

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

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

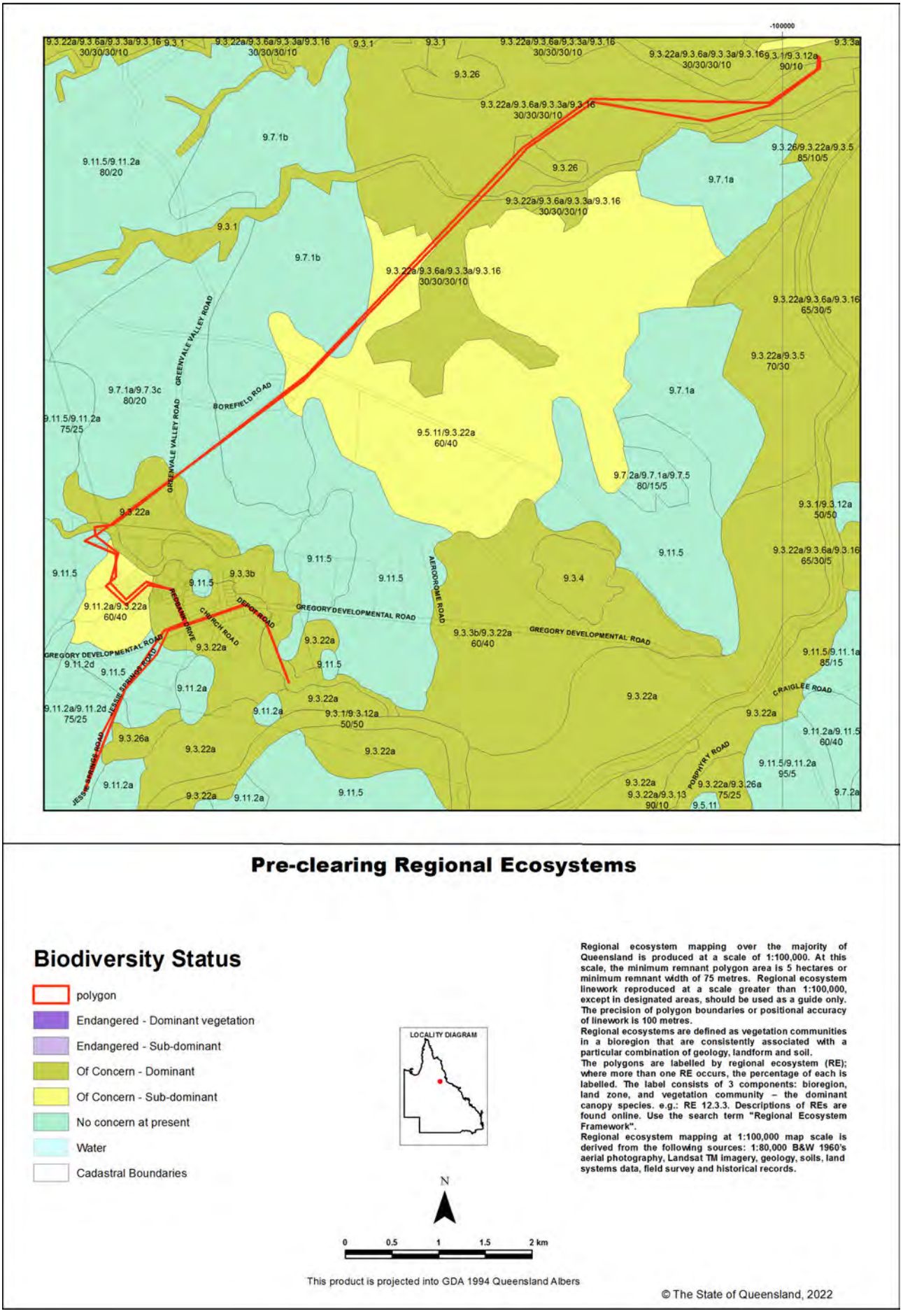
The polygons are labelled by regional ecosystem (RE); where more than one RE occurs, the percentage of each is labelled. The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search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

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

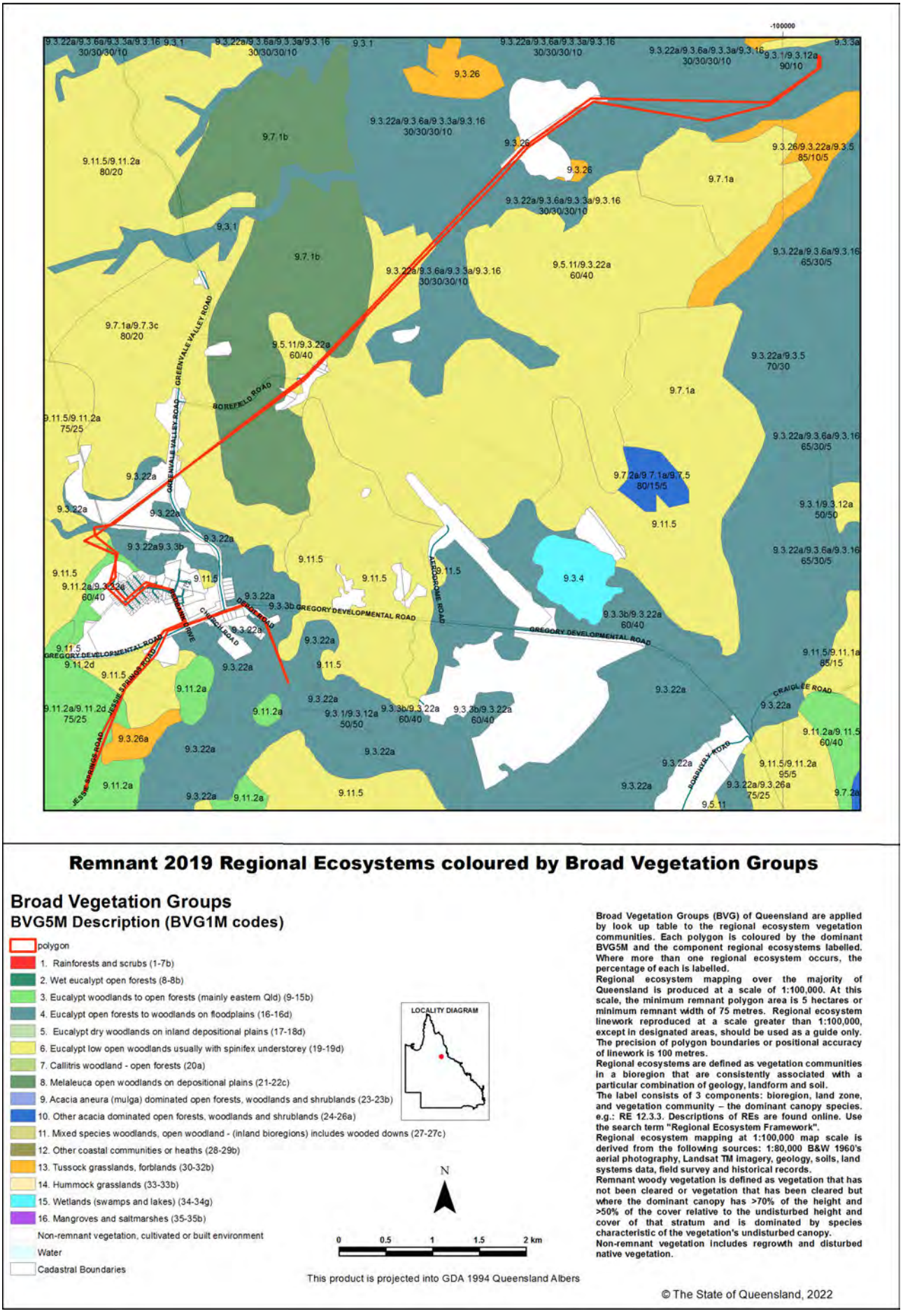
Remnant woody vegetation is defined as vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >70% of the height and >50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's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

Non-remnant vegetation includes regrowth and disturbed native vegetation.

Map 3 - Pre-clearing regional ecosystems



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



Remnant 2019 Regional Ecosystems coloured by Broad Vegetation Groups

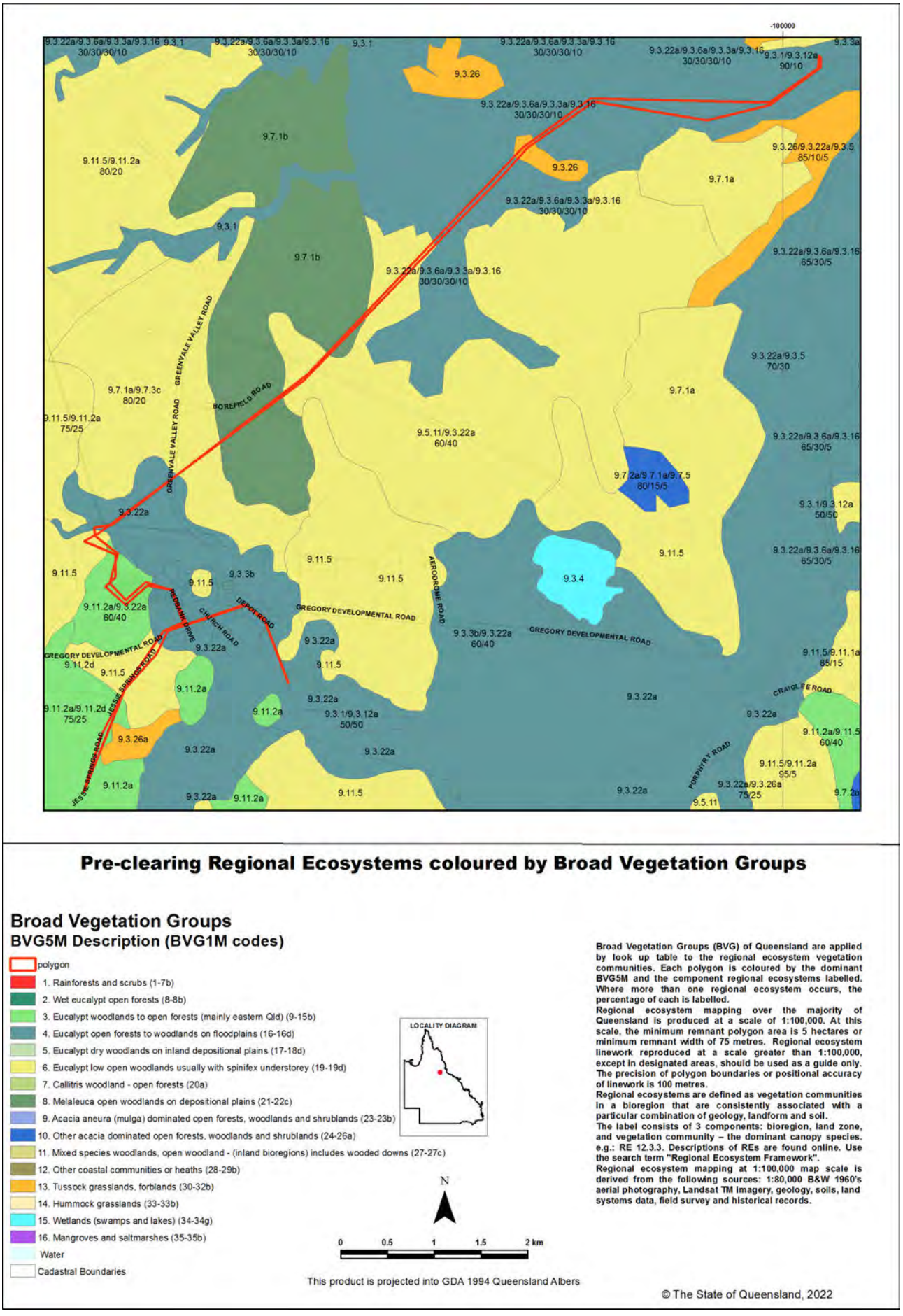
Broad Vegetation Groups
BVG5M Description (BVG1M codes)

- polygon
- 1. Rainforests and scrubs (1-7b)
- 2. Wet eucalypt open forests (8-8b)
- 3. Eucalypt woodlands to open forests (mainly eastern Qld) (9-15b)
- 4. Eucalypt open forests to woodlands on floodplains (16-16d)
- 5. Eucalypt dry woodlands on inland depositional plains (17-18d)
- 6. Eucalypt low open woodlands usually with spinifex understorey (19-19d)
- 7. Callitris woodland - open forests (20a)
- 8. Melaleuca open woodlands on depositional plains (21-22c)
- 9. Acacia aneura (mulga) dominated open forests, woodlands and shrublands (23-23b)
- 10. Other acacia dominated open forests, woodlands and shrublands (24-26a)
- 11. Mixed species woodlands, open woodland - (inland bioregions) includes wooded downs (27-27c)
- 12. Other coastal communities or heaths (28-29b)
- 13. Tussock grasslands, forblands (30-32b)
- 14. Hummock grasslands (33-33b)
- 15. Wetlands (swamps and lakes) (34-34g)
- 16. Mangroves and saltmarshes (35-35b)
- Non-remnant vegetation, cultivated or built environment
- Water
- Cadastral Boundaries

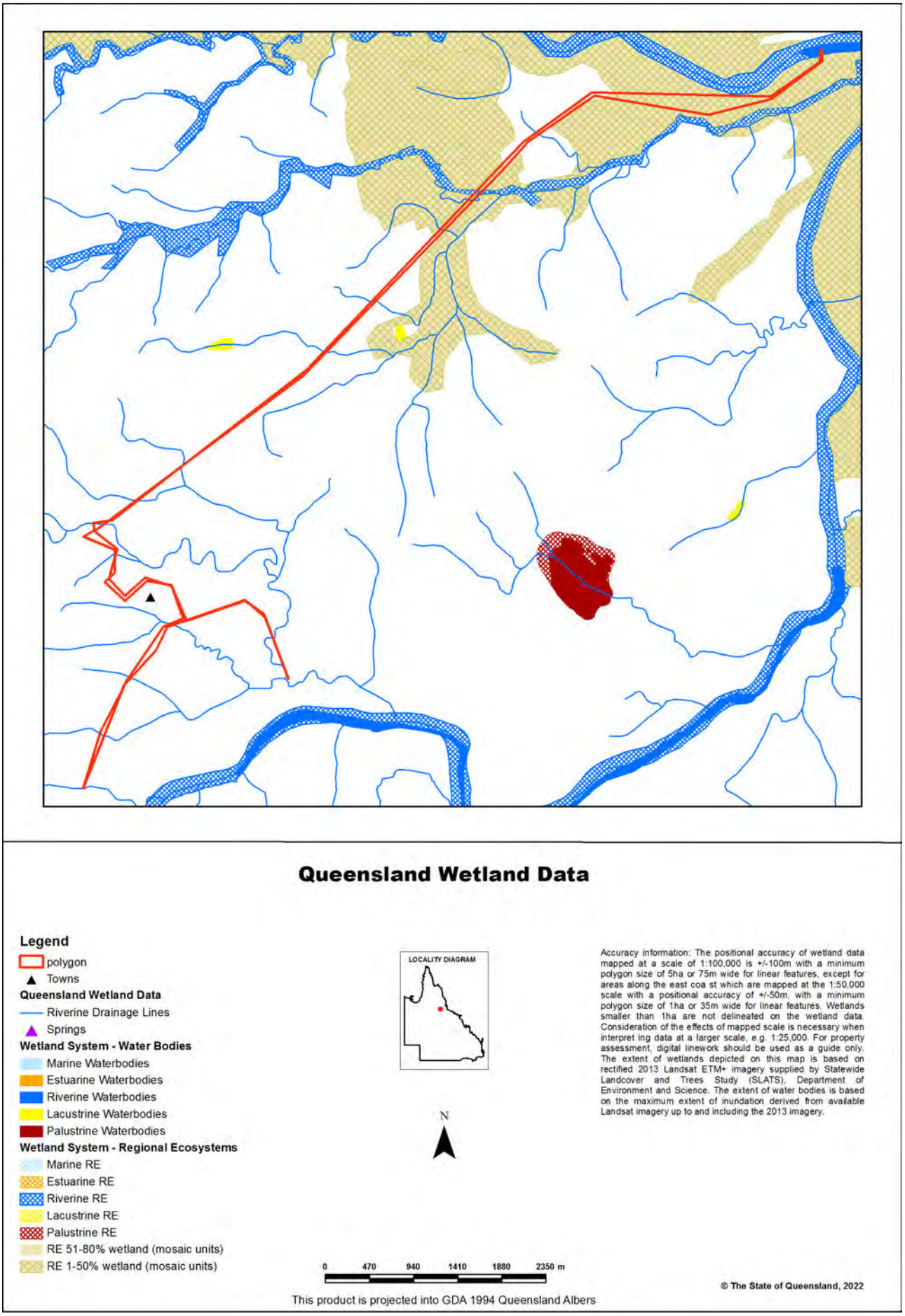
This product is projected into GDA 1994 Queensland Albers

Broad Vegetation Groups (BVG) of Queensland are applied by look up table to the regional ecosystem vegetation communities. Each polygon is coloured by the dominant BVG5M and the component regional ecosystems labelled. Where more than one regional ecosystem occurs, the percentage of each is labelled.
Regional ecosystem mapping over the majority of Queensland is produced at a scale of 1:100,000. At this scale, the minimum remnant polygon area is 5 hectares or minimum remnant width of 75 metres. Regional ecosystem linework reproduced at a scale greater than 1:100,000, except in designated areas, should be used as a guide only. The precision of polygon boundaries or positional accuracy of linework is 100 metres.
Regional ecosystems are defined as vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil.
The label consists of 3 components: bioregion, land zone, and vegetation community – the dominant canopy species. e.g.: RE 12.3.3. Descriptions of REs are found online. Use the search term "Regional Ecosystem Framework".
Regional ecosystem mapping at 1:100,000 map scale is derived from the following sources: 1:80,000 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.

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:

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

References

Neldner, V.J., Niehus, R.E., Wilson, B.A., McDonald, W.J.F., Ford, A.J. and Accad, A. (2019). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 4.0. Queensland Herbarium, Department of Environment and Science.

(https://publications.qld.gov.au/dataset/redd/resource/78209e74-c7f2-4589-90c1-c33188359086)

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Addicott, E.P. and Appelman, C.N. (2020). Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 5.1. Updated March 2020. Queensland Herbarium, Queensland Department of Environment and Science, Brisbane.

(https://publications.qld.gov.au/dataset/redd/resource/6dee78ab-c12c-4692-9842-b7257c2511e4)

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

Appendices

Appendix 1 - Source Data

The dataset listed below is available for download from:

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

- Regional Ecosystem Description Database

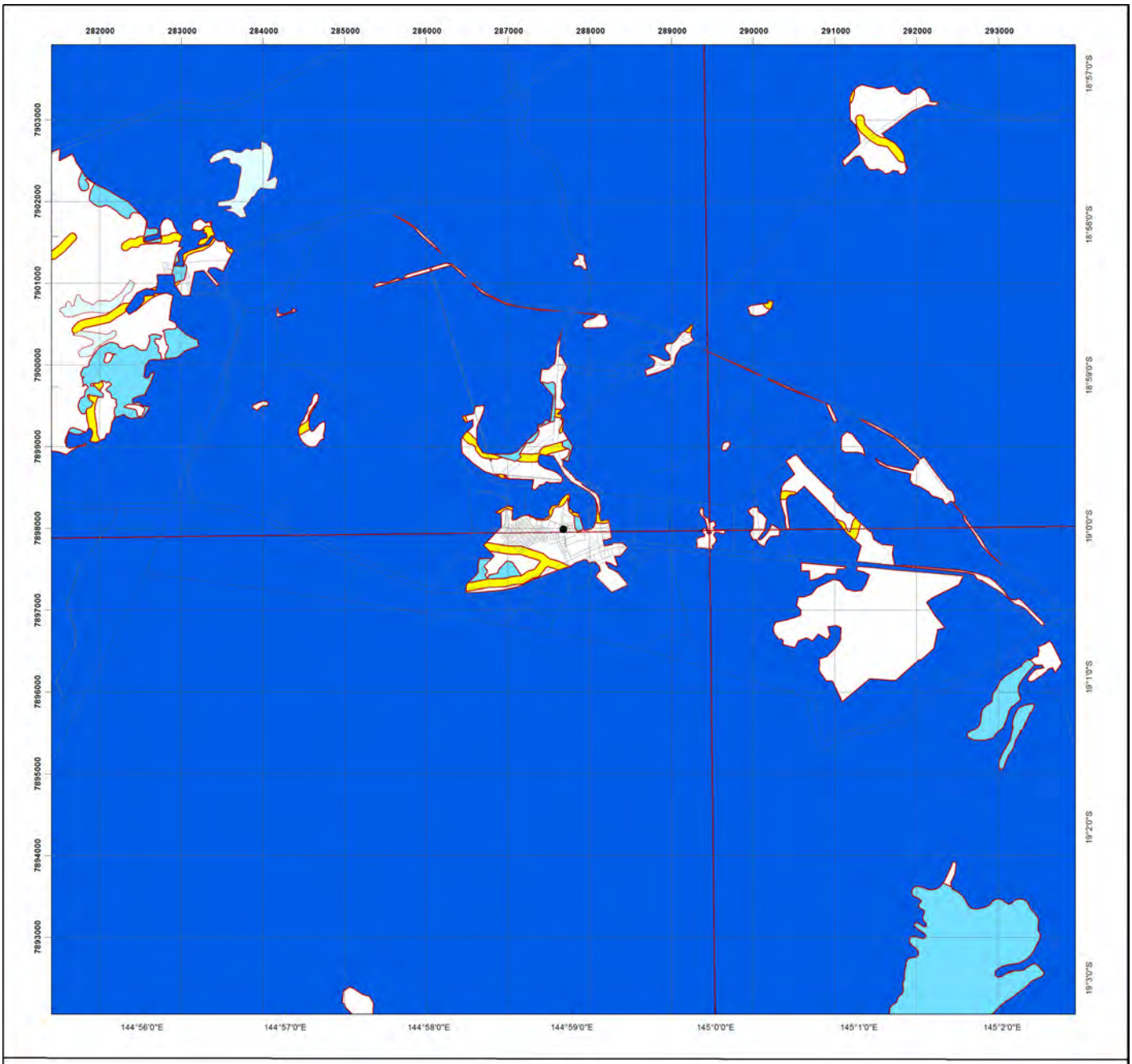
The datasets listed below are available for download from:

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

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

Appendix 2 - Acronyms and Abbreviations

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



Regulated Vegetation Management Map

Legend

- Coordinates
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries

N

0 675 1,350 2,025 2,700 3,375 m

This product is projected into:
GDA 1994 MGA Zone 55

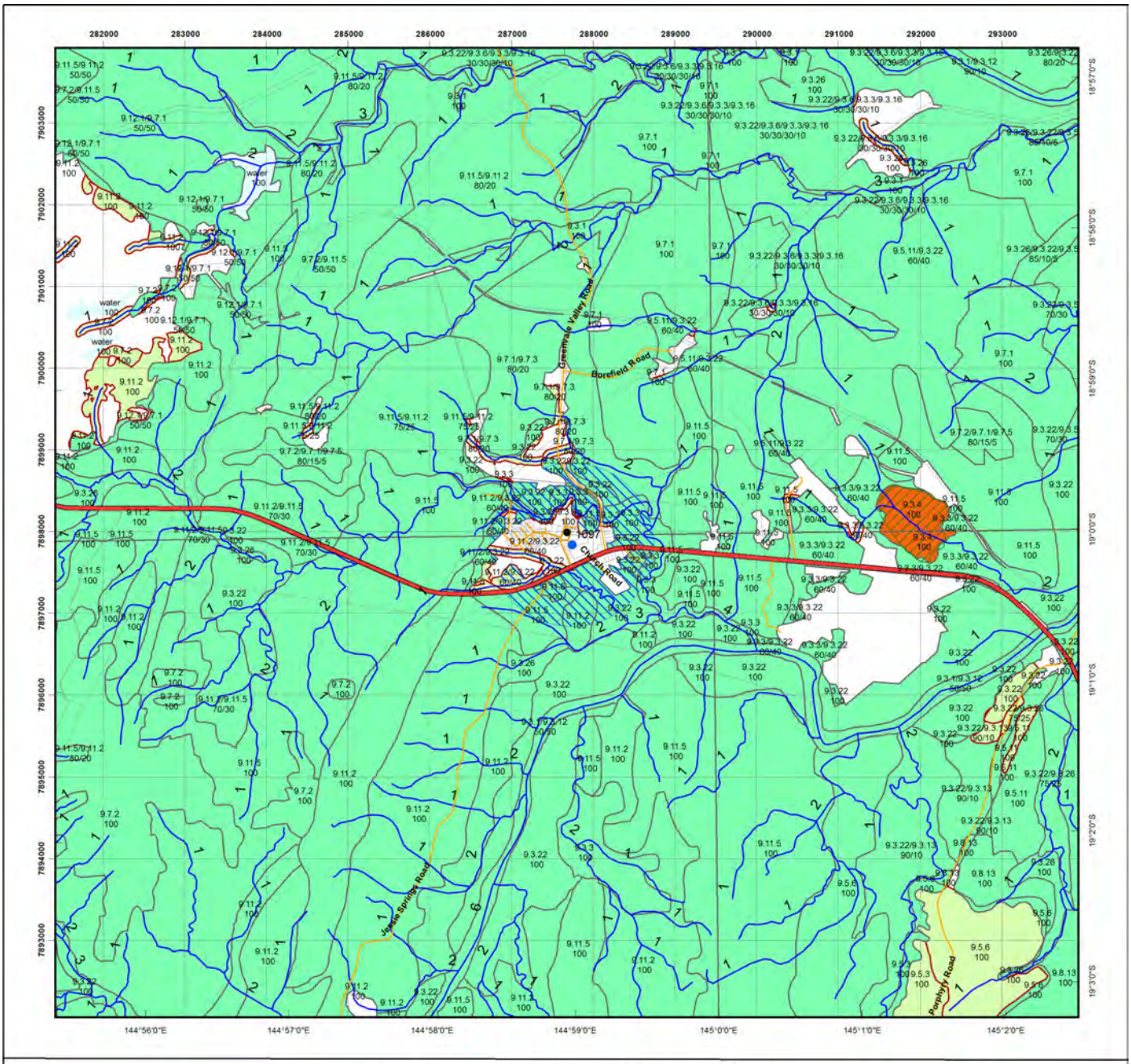
Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Resources makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.



Vegetation Management Supporting Map

Legend

- Coordinates
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map
  (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries

N

0 480 960 1,440 1,920 2,400 m

This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Resources 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 you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.resources.qld.gov.au or contact the Department of Resources.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - State Code 16: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Planning Act 2016*; and
- Accepted development vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Resources website (http://www.resources.qld.gov.au) has more information on how the layer is applied under the State Development Assessment Provisions - State Code 16: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or

2) in which the protected wildlife, at any stage of its life cycle, is located.

Protected wildlife includes critically endangered, endangered, vulnerable or near-threatened native wildlife prescribed under the *Nature Conservation Act 1992*.

Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
1097	Tyto novaehollandiae kimberli	masked owl (northern subspecies)	V	Dry and wet sclerophyll forest (including riparian), rainforest, woodland (including melaleuca swamps) & mangroves; feeding mostly in open country and cleared land along ecotones (e.g. canefield margins) and roosting in dense cover. Nest in tree hollow (40-500cm deep and 45-100cm diameter) in forested (usually eucalypt) area 10-30m above ground.	None	None	None

Label	Regional Ecosystem (mandatory unless otherwise specified)
1097	1.3.7, 1.10.5, 1.10.6, 1.11.2, 1.11.7, 1.11.8, 1.11.9, 1.11.10, 1.11.11, 1.11.12, 2.3.6, 2.3.21, 2.3.24, 2.3.26, 2.3.28, 2.3.29, 2.3.50, 2.3.52, 2.3.53, 2.3.54, 2.3.55, 2.3.56, 2.3.59, 2.3.60, 2.3.62, 2.3.64, 2.3.65, 2.3.72, 2.5.8, 2.7.1, 2.10.3, 3.1.2, 3.2.3, 3.2.4, 3.2.14, 3.3.8, 3.3.9, 3.3.10, 3.3.11, 3.3.12, 3.3.13, 3.3.17, 3.3.41, 3.3.67, 3.3.70, 3.5.21, 3.7.2, 3.8.3, 3.10.6, 3.10.12, 3.11.4, 3.11.6, 3.11.10, 3.12.7, 3.12.8, 3.12.9, 3.12.23, 3.12.24, 3.12.25, 3.12.39, 7.2.3, 7.2.4, 7.2.7, 7.2.8, 7.2.9, 7.2.10, 7.2.11, 7.3.5, 7.3.6, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.34, 7.3.35, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.46, 7.3.47, 7.3.49, 7.3.50, 7.5.1, 7.5.2, 7.5.4, 7.8.4, 7.8.7, 7.8.8, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.8, 7.11.10, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.26, 7.11.31, 7.11.32, 7.11.33, 7.11.38, 7.11.40, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.49, 7.11.51, 7.12.4, 7.12.5, 7.12.9, 7.12.12, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.29, 7.12.33, 7.12.37, 7.12.53, 7.12.54, 7.12.59, 7.12.61, 9.3.3, 9.3.15, 9.3.17, 9.5.1, 9.5.5, 9.7.2, 9.10.4, 9.10.5, 9.11.4, 9.11.17, 9.12.2

WildNet Records
Conservation Significant Species List

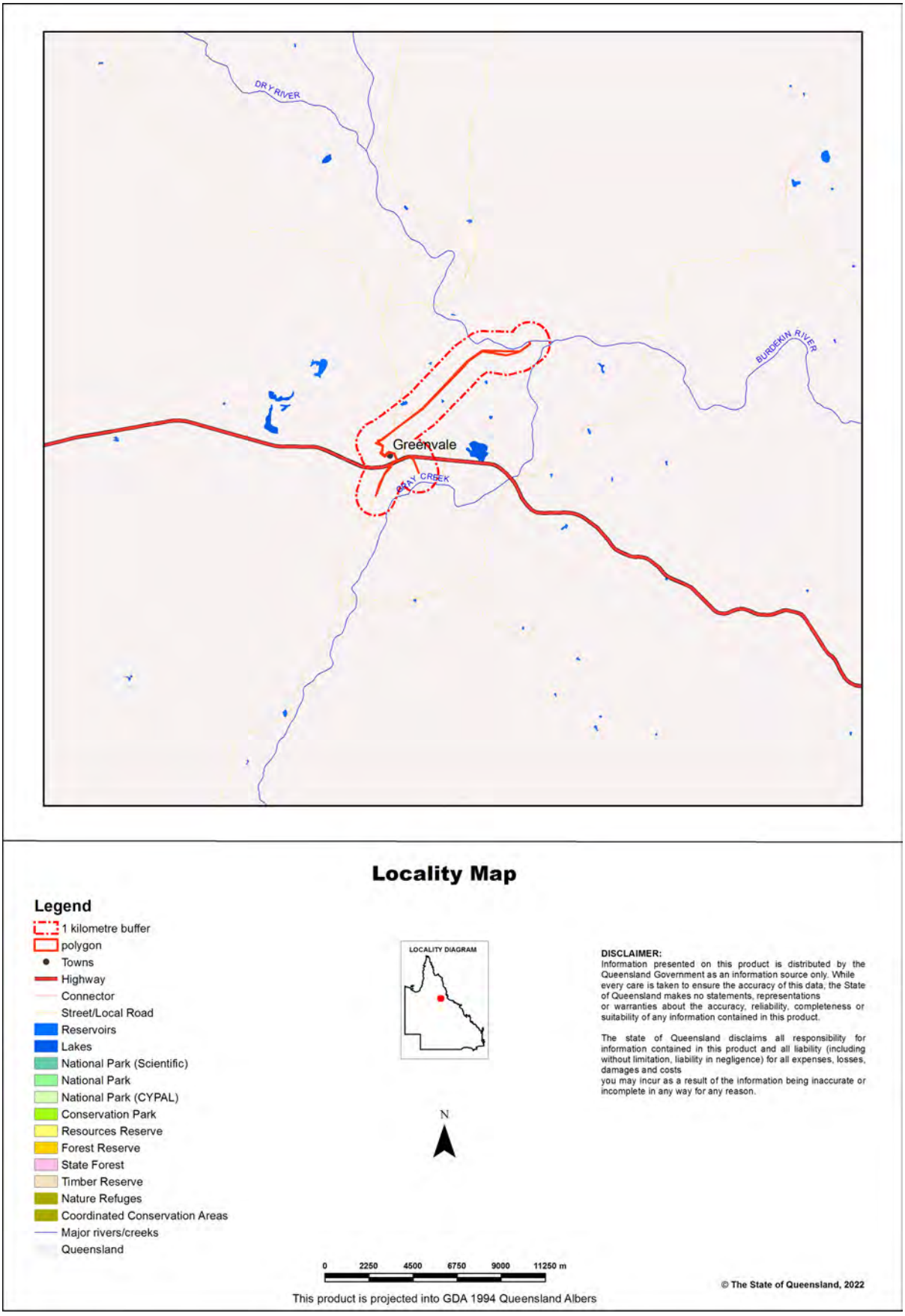
For the selected area of interest 57.65ha Custom Geometry

Current as at 01/12/2022

12547012

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	57.65
Local Government(s)	Charters Towers Regional
Bioregion(s)	Einasleigh Uplands
Subregion(s)	Broken River
Catchment(s)	Burdekin

Protected Area(s)
No estates or reserves are located within the area of interest.

World Heritage Area(s)
No World Heritage Areas are located within the area of interest.

Ramsar Area(s)
No Ramsar Areas are located within the area of interest.

Conservation Significant Species List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

Conservation significant species are species listed:

- as threatened or near threatened under the Nature Conservation Act 1992;
- as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* or
- migratory species protected under the following international agreements:
  - Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
  - China-Australia Migratory Bird Agreement
  - Japan-Australia Migratory Bird Agreement
  - Republic of Korea-Australia Migratory Bird Agreement

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Table 2 lists the species recorded within the area of interest and its one kilometre buffer.

Table 2. Conservation significant species recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1097	Animalia	Aves	Tytonidae	*Tyto novaehol landiae kimberli*	masked owl (northern subspecies)	V	V	0	1	14/07/2020

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Least Concern (C), Critically Endangered (CR), Endangered (E), Extinct (EX), Near Threatened (NT), Extinct in the Wild (PE), Special Least Concern (SL), and Vulnerable (V)).

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

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

01/12/2022 16:34:35
Custom Geometry

Protected Plants Flora Survey Trigger Map

Legend

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

N

0 480 960 1,440 1,920 2,400 m

This product is projected into:
GDA 1994 Queensland Albers

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

Land parcel boundaries are provided as locational aid only.

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

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

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

Protected plants flora survey trigger map

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

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

Updates to the data informing the flora survey trigger map

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

Species information

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

WetlandMaps Report

For selected area of interest Custom Geometry

Current as at 01/12/2022

Environmental Reports - General Information

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 ot present within the Area of Interest(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 mapping of water bodies and wetland regional ecosystems across Queensland. The Queensland wetland mapping was produced using existing information including water body mapping derived from Landsat satellite imagery, regional ecosystem mapping, topographic data, and a springs database. The result is a consistent wetland map for the whole of Queensland.

Ancillary data, such as higher resolution imagery (for example SPOT and aerial photographs), other vegetation and wetland mapping, geology, soil and land system mapping was also used in attributing and assessing the derived Queensland Wetlands Program wetland mapping products.

The wetland mapping was done in accordance with a detailed peer reviewed methodology which included quality assurance measures for all steps in the process. For more detailed information on how the Queensland Wetlands Program wetland mapping was produced, please see the Wetland Mapping and Classification Methodology.

Disclaimer

The State of Queensland, as represented by this department, gives no warranty in relation to the data (including without limitation, accuracy, reliability, completeness or fitness for a particular purpose) hosted on this website.

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Summary Information

The following table provides an overview of the area of interest.

Table 1. Area of interest details

Size (ha)	57.65
Local Government(s)	Charters Towers Regional
Bioregion(s)	Einasleigh Uplands
Subregion(s)	Broken River
Catchment(s)	Burdekin
Drainage sub-basin	Upper Burdekin River

NRM Regions

The following NRM region(s) are in the area of interest:

NQ Dry Tropics

Water Resource Plan Boundaries

The following Water Resource Plan(s) are in the area of interest:

Burdekin Basin

Learn more about how Wetlands are mapped in Queensland:

Queensland Wetlands Mapping Definitions

Wetlands are areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres. To be a wetland the area must have one or more of the following attributes:

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time.

Examples under this definition **include**:

- those areas shown as a river, stream, creek, swamp, lake, marsh, waterhole, wetland, billabong, pool or spring on the latest Sunmap 1:25,000, 1:50,000, 1:100,000 or 1:250,000 topographic map
- areas defined as wetlands on local or regional maps prepared with the aim of mapping wetlands
- wetland regional ecosystems (REs) as defined by the Queensland Herbarium (Environmental Protection Agency 2005a)
- areas containing recognised hydrophytes as provided by the Queensland Herbarium
- saturated parts of the riparian zone
- artificial wetlands such as farm dams
- water bodies not connected to rivers or flowing water such as billabongs and rock pools.

Examples under this definition **exclude**:

- areas that may be covered by water but are not wetlands according to the definition
- floodplains that are intermittently covered by flowing water but do not meet the hydrophytes and soil criteria
- riparian zone above the saturation level.

Wetland Systems

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.

Palustrine wetlands are primarily vegetated non-channel environments of less than 8 hectares. They include billabongs, swamps, bogs, springs, soaks etc, and have more than 30% emergent vegetation.

Lacustrine wetlands are large, open, water-dominated systems (for example, lakes) larger than 8ha. This definition also applies to modified systems (for example, dams), which are similar to lacustrine systems (for example, deep, standing or slow-moving waters).

Marine wetlands include the area of ocean from the coastline or estuary, extending to the jurisdictional limits of Queensland waters (3 nautical mile limit). This definition differs from that in Ramsar, as it includes waters deeper than 6m below the lowest astronomical tide.

Estuarine wetlands are those with oceanic water sometimes diluted with freshwater run-off from the land.

Subterranean wetlands are wetlands occurring below the surface of the ground and that are fed by groundwater i.e. caves and aquifers. These wetlands provide water to groundwater dependent ecosystems.

Methodology and Wetland Classification: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/wetland-background/

Links and support

Other sites that deliver wetland related information include:

Wetland*Summary* tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

Queensland Globe: https://qldglobe.information.qld.gov.au/

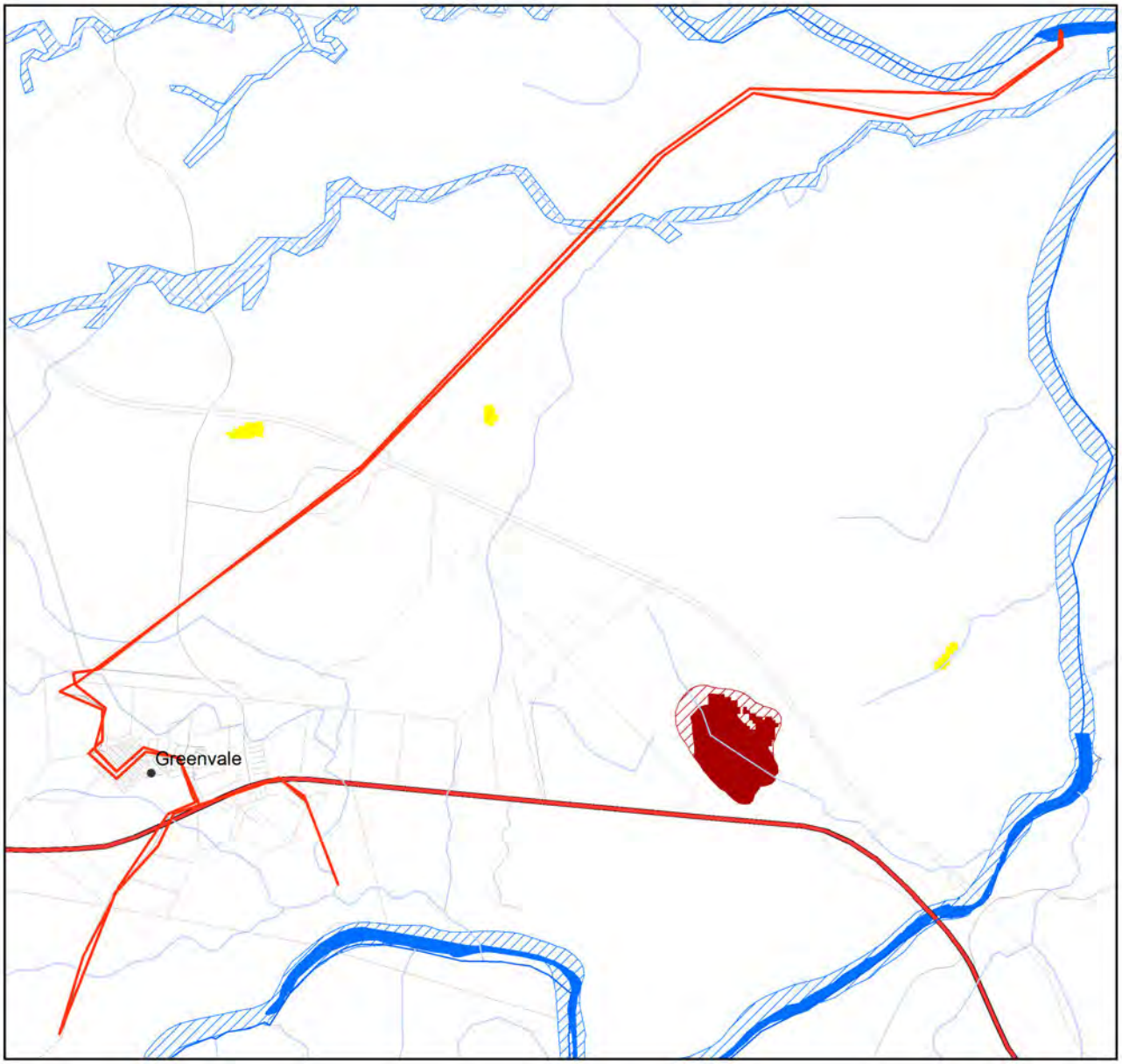
Environmental reports online: https://environment.ehp.qld.gov.au/report-request/environment/

Wetland on-line education modules: https://wetlandinfo.des.qld.gov.au/wetlands/resources/training/

Regional Ecosystem Mapping information: : https://www.qld.gov.au/environment/plants-animals/plants/herbarium/mapping-ecosystems

Aquatic Conservation Assessments: : https://wetlandinfo.des.qld.gov.au/wetlands/assessment/assessment-methods/aca/

Groundwater Dependant Ecosystems information: https://wetlandinfo.des.qld.gov.au/wetlands/ecology/aquatic-ecosystems-natural/groundwater-dependent/



Legend

- polygon
- Springs
- Dams and weirs
- Towns
- Highways
- Roads
- Cadastral boundaries
- Sub-basin

Wetland Mapping

Wetland System - Water Bodies

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies

Wetland System - Regional Ecosystems

- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51_80% wetland (mosaic units)

Riverine System Drainage Lines

- Major
- Minor

Queensland Wetland Map

Queensland Government

Australian Government

Queensland Wetlands Program

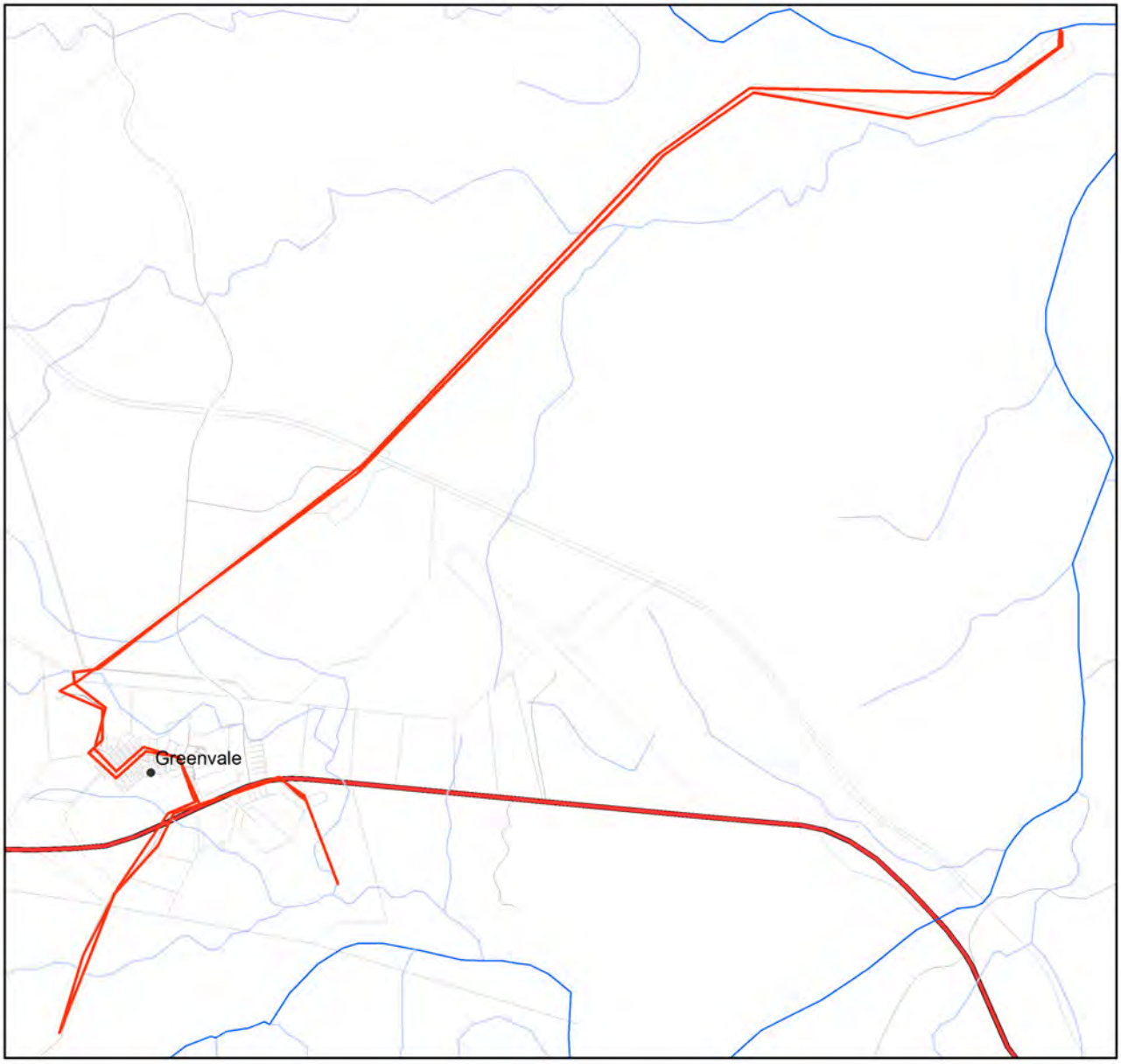
N

0 475 950 1425 1900 2375 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, December 2022.

For further information contact: wetlands@des.qld.gov.au



Queensland Wetlands of Importance Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin
- Directory of Important Wetlands
- Ramsar Wetlands

Riverine System Drainage Lines

- Major
- Minor

Queensland Government

Australian Government

Queensland Wetlands Program

N

0 475 950 1425 1900 2375 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, December 2022.

For further information contact: wetlands@des.qld.gov.au

Queensland Protected Area Map

Legend

- polygon
- Towns
- Cadastral boundaries
- Highways
- Roads
- Sub-basin

Riverine System Drainage Lines

- Major
- Minor

Protected Areas

- National Park
- National Park (Scientific)
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve

Marine Parks

- General Use Zone
- Habitat Protection Zone
- Estuarine Conservation Zone
- Conservation Park Zone
- Buffer Zone
- Scientific Research Zone
- Marine National Park Zone
- Preservation Zone

Queensland Government
Australian Government

Queensland Wetlands Program

N

0 470 940 1410 1880 2350 m

Horizontal Datum: Geographic Datum of Australia 1994 (GDA94)

This map was produced by the Queensland Wetlands Program, Department of Environment and Science, December 2022.

For further information contact: wetlands@des.qld.gov.au

Wetland habitat types in the AOI. Total area: 29.07ha

Wetland Class	Habitat type	Area (ha)
	Arid/ Semi-arid non-floodplain grass, sedge, herb swamps	28.55
Riverine	Riverine	0.52

Queensland wetland habitat typology: Major wetland habitat types for wetland conceptual models and wetland management profiles

Wetland name	Conceptual model	Wetland profile
Mangrove Wetlands	Not developed	Mangrove Wetlands
Saltmarsh Wetlands	Not developed	Saltmarsh Wetlands
Coastal and subcoastal saline swamps of all substrates, water regimes, topographic types and vegetation communities	Coastal and subcoastal saline swamps	Coastal grass-sedge wetlands
Coastal and subcoastal non-floodplain tree swamps (Melaleuca and Eucalypt) of all substrates and water regimes	Coastal and subcoastal non-floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal non-floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal non-floodplain grass, sedge and herb swamps of all substrates and water regimes	Coastal and subcoastal non-floodplain grass, sedge and herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal spring swamps of all substrates, water types, water regimes and vegetation communities	Coastal and subcoastal spring swamps	Great Artesian Basin spring wetlands
Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt of all substrates and water regimes	Coastal and subcoastal floodplain tree swamps - melaleuca and eucalypt	Coastal and subcoastal tree swamps
Coastal and subcoastal floodplain wet heath swamps of all substrates and water regimes	Coastal and subcoastal floodplain wet heath swamps	Coastal and subcoastal wet heath swamps
Coastal and subcoastal floodplain, grass, sedge herb swamps of all substrates and water regimes	Coastal and subcoastal floodplain grass, sedge, herb swamps	Coastal grass-sedge wetlands
Coastal and subcoastal tree swamps - palm of all substrates, topographic types and water regimes	Coastal and subcoastal floodplain tree swamps - palm	Coastal Palm Swamps
Coastal and subcoastal Floodplain Lakes of all substrates, water types and water regimes	Coastal and subcoastal Floodplain Lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Coastal and subcoastal non-floodplain rock lakes of all water types and water regimes	Coastal and subcoastal non-floodplain rock lakes	Coastal and subcoastal non-floodplain rock lakes
Coastal and subcoastal non-floodplain sand lakes (window) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - window	Coastal non-floodplain sand lakes
Coastal and subcoastal non-floodplain sand lakes (perched) of all water types and water regimes	Coastal and subcoastal non-floodplain sand lakes - perched	Coastal non-floodplain sand lakes
Coastal and subcoastal non-floodplain soil lakes of all water types and water regimes	Coastal and subcoastal non-floodplain soil lakes	Coastal and subcoastal floodplain lakes and non-floodplain soil lakes
Arid and semi-arid saline swamps of all substrates, water regimes, topographic types and vegetation communities	Arid and semi-arid saline swamps	Semi-arid swamps

Wetland name	Conceptual model	Wetland profile
Arid and semi-arid fresh tree swamps of all substrates, and water regimes and topographic types	Arid and semi-arid tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid lignum swamps of all substrates, and water regimes and topographic types	Arid and semi-arid lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid grass, sedge, herb swamps of all substrates, water regimes and topographic types	Arid and semi-arid grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain tree swamps of all substrates and water regimes	Arid and semi-arid non-floodplain tree swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain lignum swamps of all substrates and water regimes	Arid and semi-arid non-floodplain lignum swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid fresh non-floodplain grass, sedge, herb swamps of all substrates and water regimes	Arid and semi-arid non-floodplain grass, sedge, herb swamps	Arid swamps Semi-Arid swamps
Arid and semi-arid, non-floodplain swamps - springs of all substrates, water regimes and vegetation communities	Arid and semi-arid spring swamps	Great Artesian Basin spring wetlands
Arid and semi-arid, saline lakes of all substrates, topographic types and water regimes	Arid and semi-arid saline lakes	Arid and semi-arid lakes
Arid and semi-arid, floodplain lakes of all, substrates and water regimes	Arid and semi-arid floodplain lakes	Arid and semi-arid lakes
Arid and semi-arid, non-floodplain Lakes of all substrates and water regimes	Arid and semi-arid non-floodplain lakes	Arid and semi-arid lakes
Arid/ semi-arid, non-floodplain (clay pans) lakes of all substrates and water regimes	Arid and semi-arid fresh non-floodplain lakes (clay pans)	Arid and semi-arid lakes
Arid and semi-arid, Permanent Lakes permanently inundated lakes of all substrates, water types, topographic types and vegetation communities	Arid and semi-arid permanent lakes	Arid and semi-arid lakes

WildNet Records
Pest List

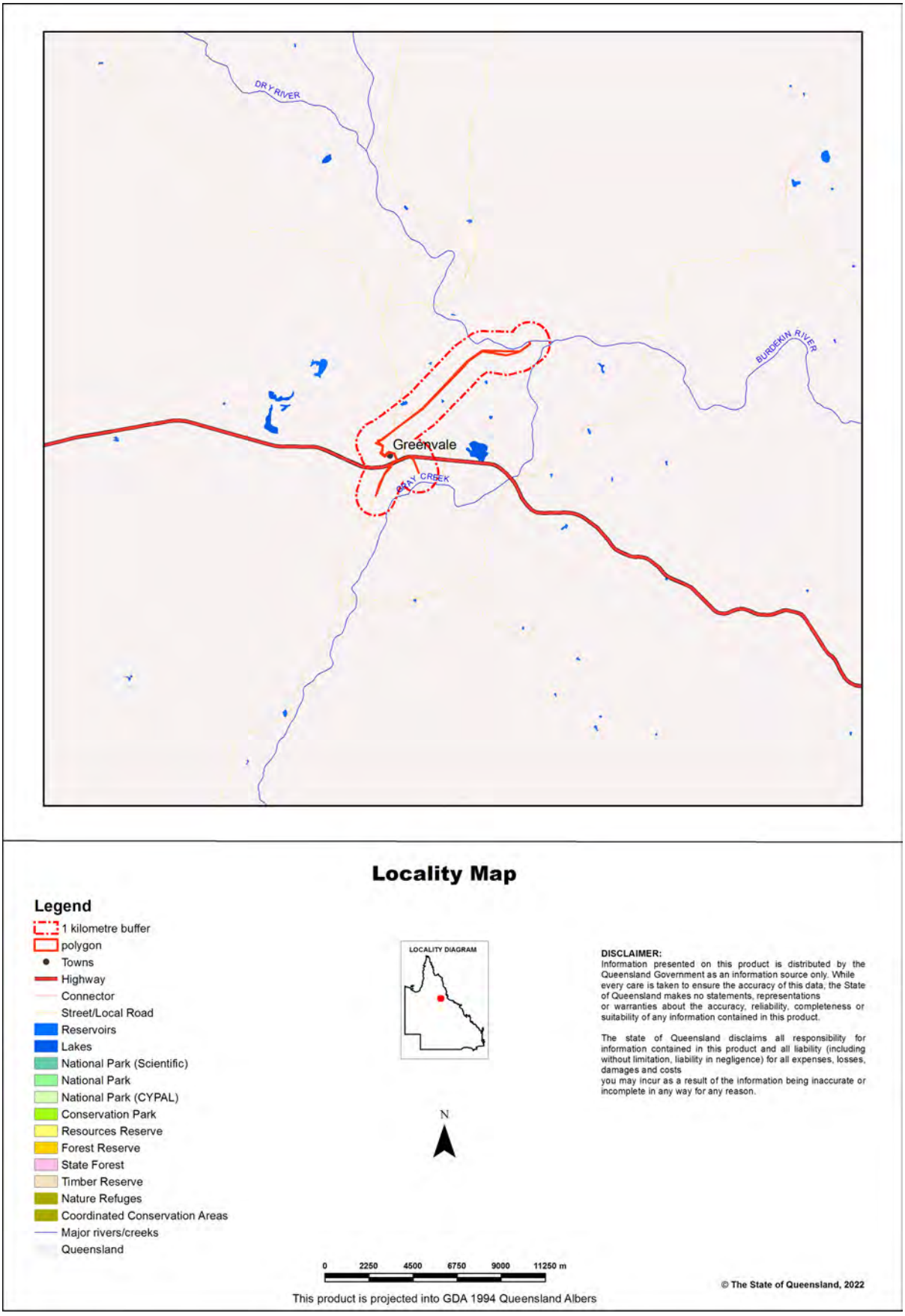
For the selected area of interest 57.65ha Custom Geometry

Current as at 01/12/2022

12547012

Queensland Government

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest Custom Geometry.

Table 1. Area of interest details

Size (ha)	57.65
Local Government(s)	Charters Towers Regional
Bioregion(s)	Einasleigh Uplands
Subregion(s)	Broken River
Catchment(s)	Burdekin

Protected Area(s)

No estates or reserves are located within the area of interest.

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Pest List

Introduction

This report is derived from a spatial layer generated from the WildNet database managed by the Department of Environment and Science. The layer which is generated weekly contains the WildNet wildlife records that are not classed as erroneous or duplicate, that have a location precision equal to or less than 10000 metres and do not have a count of zero.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species is not listed in this report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area. It is recommended that you also access other internal and external data sources for species information in your area of interest (Refer Links and Support).

Species Data

Contextual location information is presented in Map 1.

A summary of the pests recorded within the area of interest and its one kilometre buffer is presented in Table 2.

Table 2. Pests recorded within the area of interest and its one kilometre buffer

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
1360	Animalia	Aves	Passeridae	*Passer domesticus*	house sparrow	0	1	13/08/2001	II
1080	Animalia	Mammalia	Suidae	*Sus scrofa*	pig	0	1	27/08/2012	II
17693	Plantae	Equisetopsida	Apocynaceae	*Cascabela thevetia*	yellow oleander	1	1	29/08/2006	IU
36246	Plantae	Equisetopsida	Convolvulaceae	*Distimake quinquefolius*	None	1	1	29/08/2006	IU
15468	Plantae	Equisetopsida	Leguminosae	*Crotalaria lanceolata subsp. lanceolata*	None	1	1	29/08/2006	IU
14445	Plantae	Equisetopsida	Leguminosae	*Leucaena leucocephala*	None	0	1	21/05/2016	IU
14196	Plantae	Equisetopsida	Leguminosae	*Senna occidentalis*	coffee senna	1	1	17/03/2014	IU

Taxon Id	Kingdom	Class	Family	Scientific Name	Common Name	Specimens	Records	Last record	Endemicity
13300	Plantae	Equisetopsida	Lythraceae	*Ammannia auriculata*	None	2	2	09/04/1991	IU
15803	Plantae	Equisetopsida	Poaceae	*Hyparrhenia rufa subsp. rufa*	None	1	1	02/08/2012	IU
10158	Plantae	Equisetopsida	Poaceae	*Sporobolus natalensis*	None	1	1	17/03/2001	IU
14973	Plantae	Equisetopsida	Poaceae	*Themeda quadrivalvis*	grader grass	1	1	29/05/2000	IU

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Endemicity: The endemicity code for the taxon (Introduced (Intranational) (IA), Introduced (International) (II), Introduced (Unknown), Exotic (Intranational) (XA), Exotic (International) (XI) and Exotic (Unknown) (XU)).

Links and Support

Other sites that deliver species information from the WildNet database include:

- Species profile search - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- Species lists - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- Biomaps - view biodiversity information, including WildNet records approved for publication, and generate reports
- Queensland Globe - view spatial information, including WildNet records approved for publication
- Qld wildlife data API - access WildNet species information approved for publication such as notes, images and records etc.
- Wetland*Maps* - view species records, survey locations etc. approved for publication
- Wetland*Summary* - view wildlife statistics, species lists for a range of area types, and access WildNet species profiles
- WildNet wildlife records - published - Queensland - spatial layer of WildNet records approved for publication generated weekly
- Generalised distribution and densities of Queensland wildlife - Queensland species distributions and densities generalised to a 10 km grid resolution
- Conservation status of Queensland wildlife - access current lists of priority species for Queensland including nomenclature and status information
- Queensland Confidential Species - the list of species flagged as confidential in the WildNet database.

Please direct queries about this report to the WildNet Team.

Other useful sites for accessing Queensland biodiversity data include:

- Useful wildlife resources
- Queensland Government Data
- Atlas of Living Australia (ALA)
- Online Zoological Collections of Australian Museums (OZCAM)
- Australia's Virtual Herbarium (AVH)
- Protected Matters Search Tool

Disclaimer

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.

Appendix B

Likelihood of occurrence assessment

Table A1 Likelihood of occurrence assessment

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Flora				
Acacia crombiei	V	V	Distributed south east of Winton (near Bladensburg National Park) to north-west of Greenvale in the north, over a linear range of 450 km (DCCEEW, 2022h). Habitat includes wooded downs in woodlands and open woodlands, often associated with gidgee (*Acacia cambagei*) and whitewood (*Atalaya hemiglauca*), on alluvial, sandstone and basalt derived soils.	**Unlikely to occur** Habitat occurs within the Initial Works footprint; however, no records were identified within the desktop search extent and the species was not observed during field surveys. The nearest record is located approximately 33 km north of the Project. This record was recorded in *Corymbia* spp. and *Eucalyptus* spp. dominated mixed woodland on alluvial flats, levees and plains.
Cycas platyphylla	V	V	The main population is known from the Petford district, smaller quite disjunct populations recorded from Taravale, Wando Vale, and at White Mountains, north of Torrens Creek (DEWHA 2008). Occurs in sparse *Eucalyptus sideroxylon* woodland with a grassy understorey, often on rocky slopes in shallow red stony loams (DEWHA 2008).	**Unlikely to occur** Habitat was identified during field surveys. However, no records were identified within the desktop search extent and the species was not observed during field surveys. The nearest confirmed population of the species is in the Atherton Tableland, 270 km north of the Project.
Dichanthium setosum	V	LC	The species is distributed throughout inland NSW and Queensland, from Sydney to Cairns and inland to Hughenden (DCCEEW, 2022h). Occurs in heavy soils (predominantly cracking clays or alluvium, often in gilgai) in woodland or open woodland usually dominated by *Acacia* (brigalow) and / or Eucalyptus species (DCCEEW, 2022h). As a warm season perennial, the species commences growing in spring, flowers in summers and becomes dormant in late autumn (DCCEEW, 2022h).	**Unlikely to occur** The soil type was not suitable for the species. The species has not been confirmed within 279 km of the Project. Previously reported local records have since been formally reidentified as *Dichanthium sericeum.*
Lepturus minutus	NL	V	The species is distributed from Chillagoe in the north to Greenvale in the south (AusGrass2, 2010). Surrounding records describe the habitat as dry rainforest on tertiary surface, vine thicket on rocky limestone and in understorey of *Melaleuca bracteata* scrub (ALA, 2021). Detection of the species is likely dependent on seasonal conditions.	**May occur** Species has been historically recorded within the desktop search extent; however, no habitat (vine thicket communities on rocky slopes or *Melaleuca bracteata* scrub) was observed during field surveys.
Tephrosia leveillei	V	LC	The species is distributed throughout a small area of eastern and central northern Queensland, from Charters Towers to Cairns and west to Georgetown (DCCEEW, 2022h).	**Unlikely to occur** No historical records were identified within the desktop assessment. The nearest record is located approximately 100 km north of the Project and no habitat was identified within the Initial Works footprint.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Birds				
Calidris ferruginea Curlew sandpiper	CE, Mig	E	The curlew sandpiper is widely distributed around Australia; however, the species occurs in high densities on coastal areas (DCCEEW, 2022h; Menkhorst et al., 2019; Pizzey and Knight, 1999). Small numbers are known to occur in inland Australia (DCCEEW, 2022h). Preferred habitats include intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also non-tidal swamps, lakes and lagoons (DCCEEW, 2022h). They are also recorded inland around ephemeral and permanent lakes, dams, waterholes and bore drains (DCCEEW, 2022h).	**Unlikely to occur** This species has not been recorded from the desktop search extent. The closest record is 94 km north-west of the Initial Works footprint. No habitat was observed from field surveys. The species has the capacity to fly over the Initial Works Project area during migration; however, the species is unlikely to occur due to the lack of habitat.
Erythrotriorchis radiatus Red goshawk	V	E	The red goshawk is widely distributed throughout northern and eastern Australia, particularly in a wide coastal strip along eastern Queensland, through to Cape York and west into the Northern Territory and the Kimberly. The species occurs in a range of habitats, often at ecotones, including coastal and sub-coastal tall open forests, tropical savannahs crossed by wooded or forested watercourses, woodlands, edges of rainforests and gallery forests along watercourses, and wetlands that include Melaleuca and Casuarina species (Menkhorst et al., 2019). The species typically nests in tall trees within 1 km of permanent water and occurs in habitats that support a high abundance of bird species (Pizzey & Knight, 1999).	**Likely to occur** The desktop review did not confirm known records of the species within the search extent. The nearest historical record is located approximately 151 km northeast of Wade; however, an anecdotal record was reported from Lucky Springs by Project consultants. Limited nesting and foraging habitat were observed within the Initial Works footprint; however, the species occupies a large home range (200 km^2) and has the potential to occur within the Initial Works footprint.
Erythrura gouldiae Gouldian finch	E	E	The species inhabits tropical eucalypt and paperbark woodlands, where they feed on grass seeds and drink at waterholes (TSSC, 2016b). During the breeding season, they inhabit small areas of open woodland retaining hollow-bearing trees, with a grassy understorey containing sorghum (*Sorghum* spp.), *Schizachyrium* spp. and spinifex (*Trodia* spp.) and within 2-4 km of perennial waterholes or springs (TSSC, 2016b).	**May occur** The species was recorded within the desktop search extent; however, the closest record is mapped as 77 km north-west of the Initial Works footprint. Gouldian finch habitat including grassy open woodlands with abundant small hollow-bearing trees was recorded within the Initial Works footprint, However, waterholes and springs and the key grassy foraging species were not observed during field surveys, however waterholes and springs were not observed during field surveys.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Falco hypoleucos Grey falcon	V	V	The grey falcon is an extremely rare raptor which occurs at unusually low densities, exclusively in the arid and semi-arid zones of Australia (Schoenjahn, 2013). It inhabits a range of habitat types, including lightly timbered woodlands, *Acacia* shrublands and Triodia grasslands with annual rainfall under 500 mm (Marchant & Higgins, 1993). The species core breeding habitat lies within areas of the hottest climate classes (Schoenjahn, 2018), situated between the eastern and western borders of the central deserts of Western Australia.	**May occur** This species has not been recorded from the desktop search extent, however, open woodland habitat was observed from field surveys.
Geophaps scripta scripta Squatter pigeon (southern)	V	V	In Queensland, the squatter pigeon (southern) can be found from the Burdekin - Lynd divide to the NSW / Qld border. Generally, the species is encountered west of the Great Diving Range (DCCEEW, 2022h). The species occurs in open forests to sparse, open-woodlands and scrub that are dominated by Eucalyptus, Corymbia and *Acacia* or Callitris species, remnant and regrowth within 3 km of water (DCCEEW, 2022h). Breeding and foraging habitat is generally restricted to well-draining, gravelly, sandy or loamy soils with a tussock-grassy understorey (Squatter Pigeon Workshop, 2011).	**Likely to occur** This species has not been recorded from the desktop search extent however the northern subspecies has been locally recorded in high abundance and the southern subspecies has the potential to occur in mixed populations. Open woodland with native grassy understorey habitat was observed from field surveys. The species known distribution is mapped outside of the GVTA.
Poephila cincta cincta Black-throated finch (southern)	E	E	This species occurs at two general locations: the Townsville and Charters Towers region and in scattered sites in central-eastern Queensland (BTF Recovery Team, 2004). The species inhabits grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (DCCEEW, 2022h). Permanent water sources are the most critical limiting resource, along with an abundance of perennial grasses with a high moisture content and early wet season germination (DEWHA, 2009).	**Likely to occur** The species has been historically recorded within 10 km of the Initial Works footprint. Seeding grassy open woodlands adjacent permanent and ephemeral to watercourses were observed from field surveys.
Rostratula australis Australian painted snipe	E	V	The Australian painted snipe has a broad distribution and known to occur in all mainland states of Australia. The species generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps, claypans and waterlogged grasslands (DCCEEW, 2022h, Menkhorst et al., 2019).	**Unlikely to occur** This species has not been recorded from the desktop search extent and no habitat was observed from field surveys. The species has been historically recorded 55 km southeast of the Project area.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Tyto novaehollandiae kimberli Masked owl (northern)	V	V	The masked owl (northern) occurs throughout northern Australia, from Mackay to the Kimberley region of Western Australia (DCCEEW, 2022h). The species inhabits riparian forest, rainforest, open forest, Melaleuca swamps, edges of mangroves, margins of sugar cane fields (DCCEEW, 2022h; Menkhorst et al., 2019). Key habitat requirements for the species include a large home range, presence of hollow-bearing trees for nesting and the abundance of arboreal and small mammals (Woinarski, 2004).	**May occur** The species has been historically recorded within the desktop search extent. However the closest record is 115 km east of the Initial Works footprint, south of Ingham. No forest habitat was observed from field surveys.
Reptiles				
Egernia rugosa Yakka skink	V	V	The yakka skink is endemic to Queensland, although records close to the Queensland - NSW border suggest it is also present in northern NSW (DCCEEW, 2022h). The species is typically found in open dry sclerophyll forest or woodland. This skink uses refuges in dense ground vegetation, in hollow logs, cavities in soil-bound root systems and beneath rocks (DCCEEW, 2022h).	**May occur** The desktop review did not confirm known records of the species within proximity of the Initial Works footprint, and the nearest historical record of the species is approximately 122 km southwest of the Initial Works footprint. No latrine sites, burrows or other evidence of the species was observed from field surveys; however, habitat in the form of dense ground vegetation, hollow logs and soil cavities were present.
Mammals				
Dasyurus hallucatus Northern quoll	E	LC	The northern quoll was once distributed throughout much of northern Australia; however, the species range is now highly fragmented due to habitat clearing and cane toad invasion (DCCEEW, 2022h). The species inhabits a variety of habitats, ranging from eucalypt woodlands to rainforests (TSSC, 2005). Species particularly prefers areas that contain rock crevices, hollow logs and termite mounds (DCCEEW, 2022h).	**May occur** The desktop review did not confirm known records of the species within proximity of the Initial Works footprint, and the nearest historical record of the species is approximately 90 km north of the Initial Works footprint. Sub-optimal denning habitat is present in infrequent large hollow ground logs within the Initial Works footprint and the species has a low probability to temporarily forage within the Initial Works footprint.
Macroderma gigas Ghost bat	V	E	The ghost bat inhabitants a highly fragmented distribution, with geographically disjunct colonies occurring in the Pilbara, Kimberley, Northern Territory, the Gulf of Carpentaria and coastal and near coastal eastern Queensland (DCCEEW, 2022h). This species is known to occur in rainforest areas, vine shrub, open woodlands and arid zone (McKenzie & Hall, 2008), and roosts in caves, rock crevices and old mine shafts (TSSC, 2016a). The species requires multiple roosting sites and move between several caves seasonally or as dictated by weather conditions (TSSC, 2016a).	**Unlikely to occur** The species has not been historically recorded within the Initial Works footprint and the nearest historical record is located approximately 98 km north of the Initial Works footprint. Habitat for the species, such as limestone caves and vine thickets were not identified in the Initial Works footprint.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Mesembriomys gouldii rattoides Black-footed tree-rat	V	LC	The distribution of the black-footed tree rat (north Queensland subspecies) is poorly known. It has been recorded mostly from eucalypt forests and woodlands (but not rainforests) around Mareeba, but there are records sparsely across Cape York Peninsula. The species den in tree hollows, and occasionally in dense foliage (e.g. Pandanus) (TSSC, 2015d). They mostly forage up to 500 m from roost sites on fruits (e.g. *Pandanus tectorius*) and seeds, as well as invertebrates, flowers and grass (TSSC, 2015d).	**Unlikely to occur** The species has not been historically recorded within the Initial Works footprint and the nearest historical record is located approximately 55 km east of the Initial Works footprint. Denning habitat was detected throughout the Initial Works footprint; however, foraging species (*Pandanus tectorius*) was not observed from field surveys.
Petauroides minor Greater glider (northern)	V	V	The greater glider (northern)r is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria. This species is largely restricted to eucalypt forests and woodlands (DCCEEW, 2022h). Species requires abundance of hollow- bearing trees which provide den sites and is generally restricted to extensive forest networks larger than 160 km^2 (DCCEEW, 2022h).	**Likely to occur** This species has been recorded in the larger GVTA area and denning and foraging habitat was observed adjacent the Initial Works footprint from field surveys. especially in areas where *Eucalyptus persistens* and *E. platyphylla* occurred.
Phascolarctos cinereus Koala	E	E	The range of the species extends from north-eastern Queensland to the south-east corner of South Australia (DCCEEW, 2022h). Inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species. In Queensland, Koalas are also found in vegetation communities dominated by Melaleuca or Casuarina species (DCCEEW, 2022h).	**Likely to occur** The koala was confirmed present in seven locations within the Greenvale Training Area; however, no evidence of the species was recorded during the Initial Works surveys. Habitat for the koala is widely available within the Initial Works footprint and surrounding landscape.
Rhinolophus robertsi Greater large-eared horseshoe bat	V	E	This species is found in lowland rainforest, along gallery forest-lined creeks within open eucalypt forest, Melaleuca Forest with rainforest understorey, open savannah woodland and tall riparian woodland (DCCEEW, 2022h). They roost in caves and underground mines, as well as culverts, tree hollows, dense foliage, rock piles and areas beneath creek banks (DCCEEW, 2022h). The species forages in open forest, particularly amongst dense vegetation along gullies and creek lines, as well as wattle-dominated ridges in rainforests (DCCEEW, 2022h).	**May occur** This species was confirmed present from one location within the Main Works Project area, however no evidence of the species was recorded during the Initial Works surveys. Roosting habitat such as large hollow bearing trees are present adjacent the Initial Works footprint and the species may occur.
Saccolaimus saccolaimus nudicluniatus Bare-rumped sheath-tailed bat	V	E	The bare-rumped sheath-tail bat is predicted to occur across of northern Australia, (DCCEEW, 2022h). Preferred habitat for the species typically includes lowland areas supporting a range of woodland, forest and open environments with roosts typically within tree hollows, caves, overhangs or man-made structures (DCCEEW, 2022h).	**May occur** The species has not been historically recorded within the Initial Works footprint. The nearest historical record is located approximately 138 km east of Christmas Creek. However the quality of roosting habitat in hollow trees was high within the Initial Works footprint.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Migratory species				
Actitis hypoleucos Common sandpiper	Mig	LC	The common sandpiper is widely distributed across much of Australia, including Tasmania and several offshore islands (DCCEEW, 2022h). Species inhabits coastal wetlands and some inland wetlands. They mostly occur around muddy margins or rocky shores, and occasionally around lakes, billabongs, reservoirs, dams and claypans (Menkhorst et al., 2019). Species generally forages in shallow water and on bare soft mud edges of wetlands (DCCEEW, 2022h).	**Unlikely to occur** The desktop review did not confirm known records of the species within the Initial Works footprint, and the nearest historical record is located approximately 123 km of the Initial Works footprint. Habitat for the common sandpiper was not observed from field surveys.
Apus pacificus Fork-tailed swift	Mig	LC	The fork-tailed swift occurs over much of the Australian mainland, excluding only the Western Australian deserts (DCCEEW, 2022h). Throughout its range, the species occurs mostly over inland plains, above foothills and in coastal areas (DCCEEW, 2022h). The species is almost entirely aerial favours dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, riparian woodlands, health land or saltmarsh (Menkhorst et al., 2019; Pizzey & Knight, 1997). They are also found at treeless grassland and sandplains covered with spinifex.	**Likely to occur** The species was recorded on two occasions within the Main Works Project area and has historically been sited approximately 400 m from the Initial Works footprint, within Greenvale village. Habitat for the fork-tailed swift was observed during field surveys,
Calidris acuminata Sharp-tailed sandpiper	Mig	LC	The sharp-tailed sandpiper is a non-breeding visitor to much of Australia, particularly Queensland, New South Wales and central Northern Territory (DCCEEW, 2022h). The species is often encountered in inland freshwater wetlands (Menkhorst et al., 2019), but also favours damp grasslands, tidal flats, mangroves and swamp margins (Menkhorst et al., 2019; Pizzey & Knight, 1999).	**Unlikely to occur** This species was not recorded within the desktop search extent and no habitat was observed during field surveys.
Calidris melanotos Pectoral sandpiper	Mig	LC	The pectoral sandpiper is widely distributed across Australia; however, the species is known to favour coastal areas (DCCEEW, 2022h). In Queensland, the majority of sightings occur around the Cairns region (DCCEEW, 2022h). Species inhabits shallow fresh to saline wetlands. The species is found within coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, creeks, floodplains and artificial wetlands (Menkhorst et al., 2019). The species is a non-breeding visitor to Australia, with breeding occurring in northern America and northern Russia.	**Unlikely to occur** The desktop review did not confirm known records of the species within proximity to the Initial Works footprint, and the nearest historical record was 177 km away. Habitat for the species was not observed during field surveys.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Cuculus optatus Oriental cuckoo	Mig	SLC	The oriental cuckoo is a non-breeding migrant to Australia, with breeding occurring broadly across northern Eurasia east to northern China, Korea and Japan. In Australia, the species inhabits coastal regions across northern and eastern Australia, as well as offshore islands (DCCEEW, 2022h). Species utilises a range of vegetated habitats, including monsoon rainforests, wet sclerophyll forests, open woodlands and along the edges of forests (DCCEEW, 2022h; Menkhorst et al., 2019).	**May occur** The desktop review did not confirm known records of the species within proximity to the Initial Works footprint, and the nearest historical record is approximately 64 km away. Habitat for the Oriental cuckoo, including open woodlands were confirmed present within the Initial Works footprint.
Gallinago hardwickii Latham's snipe	Mig	SLC	Latham's Snipe is a non-breeding visitor to Australia, arriving in south-eastern Australia between August and January (Higgins & Davies, 1996). During its migration, the species is encountered along much of eastern Australia (DCCEEW, 2022h). The species often occurs in groups or individually in freshwater wetlands near the coast, preferring dense vegetation cover such as sedges, grasses, lignum, reeds and rushes (BirdLife, 2021).	**Unlikely to occur** The desktop review did not confirm known records of the species within proximity to the Initial Works footprint, and the nearest historical record is approximately 37 km away. No habitat for the species was observed during field surveys.
Hirundo rustica Barn swallow	Mig	LC	The barn swallow occurs throughout coastal, tropical areas of Queensland, Northern Territory and Western Australia (Menkhorst et al., 2019). The species inhabits open country in coastal lowlands near water, especially wetlands (Menkhorst et al., 2019). Also known from Melaleuca woodland, mesophyll shrub thickets and tussock grassland (DCCEEW, 2022h).	**Unlikely to occur** The desktop review did not confirm known records of the species within proximity to the Initial Works footprint, and the nearest historical record is approximately 130 km away. No habitat for the species was observed during field surveys as this species is mainly associated with coastal habitats.
Motacilla cinerea Grey wagtail	Mig	LC	The grey wagtail occurs widely across western and Central Australia, only reaching the eastern coastline around the Townsville region (DCCEEW, 2022h). However only scattered, isolated records are known. Species inhabits forests and woodlands in close proximity to running water (Pizzey & Knight, 1997). Recorded along beaches and rockpools during migration (Menkhorst et al., 2019).	**May occur** The desktop review did not confirm known records of the species within close proximity to the Initial Works footprint, and the nearest historical record is approximately 122 km away. The species occurs across broad habitat types. Habitat for the grey wagtail is present within open woodlands adjacent to water sources.
Motacilla flava Yellow wagtail	Mig	LC	The yellow wagtail occurs through coastal regions of Queensland, Northern Territory and northern Western Australia (Menkhorst et al., 2019). The species is a common migrant from Asia and is found in highly variable habitats, but typically open grassy flats near water. Additional habitats include open areas of low vegetation such as grasslands, pastures, sport fields and damp open areas (DCCEEW, 2022h).	**Unlikely to occur** The desktop review did not confirm known records of the species within the search extent, and the nearest historical record is approximately 129 km east of the Initial Works footprint. Habitat for the yellow wagtail was not observed during field surveys.

Species name	Conservation status		Distribution and habitat requirements	Likelihood of Occurrence
	EPBC Act	NC Act		
Myiagra cyanoleuca Satin flycatcher	Mig	LC	The satin flycatcher has a broad distribution, occurring throughout eastern Australia and Tasmania (Pizzey & Knight, 1999). The species migrates annually to north in the winter months (Pizzey & Knight, 1999). The species occurs in a range of habitats, predominantly favouring heavily vegetated gullies associated with wetlands and watercourses in wet sclerophyll woodland, coastal forests, woodlands, mangroves and drier woodlands and forests (Menkhorst et al., 2019).	**Likely to occur** One individual was recorded at Jack's Hill Gorge during the 2019 field assessment of the Main Works Project area. The desktop review did not confirm known records of the species within the search extent. The nearest historical record is located approximately 85 km east of the Initial Works footprint. Habitat of dense riparian vegetation was confirmed present within the Initial Works footprint.
Myiagra cyanoleuca Satin flycatcher	Mig	LC	The satin flycatcher has a broad distribution, occurring throughout eastern Australia and Tasmania (Pizzey & Knight, 1999). The species migrates annually to north in the winter months (Pizzey & Knight, 1999). The species occurs in a range of habitats, predominantly favouring heavily vegetated gullies associated with wetlands and watercourses in wet sclerophyll woodland, coastal forests, woodlands, mangroves and drier woodlands and forests (Menkhorst et al., 2019).	**Likely to occur** One individual was recorded at Jack's Hill Gorge during the 2019 field assessment of the Main Works Project area. The desktop review did not confirm known records of the species within the search extent. The nearest historical record is located approximately 85 km east of the Initial Works footprint. Habitat in the form of dense riparian vegetation was confirmed present within the Initial Works footprint.
Pandion haliaetus Osprey	Mig	SLC	The eastern osprey is distributed around the Australian coastline, excluding only Victoria and Tasmania (NSW EOH, 2020). Preferred habitats for the species include coastlines, estuaries, bays and inlets, river systems and lake complexes, and the species are known to venture inland, particularly in northern Queensland (Pizzey & Knight, 1999; OEH, 2020). The species favours large, emergent trees, cliff faces and high vantage points as nesting habitat, usually in exposed locations and within 1 km of water (Thomson et al., 2019).	**May occur** The desktop review did not confirm known records of the species within the search extent. While the species is mainly associated with coastal habitats, ospreys are known to venture inland in northern Queensland. The Initial Works field surveys recorded habitat for the osprey in the form of large emergent trees within 1 km of water.
Tringa nebularia Common greenshank	Mig	SLC	Species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. Typically occurs in sheltered coastal areas with large mudflats, saltmarshes, mangroves or seagrasses (DCCEEW, 2022h). Species also occurs in permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains (DCCEEW, 2022h).	**May occur** The desktop review did not confirm known records of the species within the search extent. The nearest historical record is located approximately 46 km west of Pandanus (Shield Creek). Habitat for the common greenshank was observed within the Initial Works Project area, associated with rivers and ephemeral creeks.

Key to table: Mig – migratory; NL – not listed; LC – least concern; V – vulnerable; E – endangered; CE – critically endangered; SLC – special least concern

Appendix C

Habitat mapping criteria for conservation significant species

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Matters of National Environmental Significance		
Threatened fauna		
Red goshawk (*Erythrotriorchis radiatus*)	**Habitat critical to the survival of the species:** Habitat critical to the survival of the species is defined in *the National recovery plan for the Red Goshawk (Erythrotriorchis radiatus)* (DERM, 2012). This habitat is defined as all known sites for nesting, food resources, water, shelter, essential travel routes, dispersal, buffer areas and sites needed for the future recovery as defined by the EPBC Act (DERM, 2012). **General habitat requirements:** As a bird-eating raptor, the red goshawk requires vegetative cover for both roosting and ambush hunting (DCCEEW, 2023a). The species breeds solitarily, in forested or wooded areas, often adjacent to or within 1 km of permanent water, and in large trees, usually the tallest in the area (over 20 m tall) (DCCEEW, 2023a). Nest trees are sometimes selected along clearings, but always within 1 km of permanent water (DERM, 2012). Habitats providing appropriate foraging conditions include intact woodlands and forests with a mosaic of vegetation types (DCCEEW, 2023a). Foraging habitats containing permanent water is favoured due to the ability to support biologically rich population of birds (Sattler & Williams, 1999). The species generally avoids very open or very densely vegetated habitats but will hunt along ecotones (DERM, 2012). Past studies of the red goshawk in southeast Queensland have documented the species' preference towards permanently watered, remote areas with rugged terrain and tall, mature vegetation, primarily eucalypt woodlands (Czechura et al., 2010).	**Critical nesting habitat:** Nesting habitat has been mapped as mature tall open woodland vegetation communities dominated by *Eucalyptus/Corymbia* and *Acacia* on any soil type within 1 km of the southern bank of the Burdekin River. These vegetation communities have been included as they contain the tall vegetation and close proximity to a permanent water source required for nesting. **Critical foraging habitat:** Foraging habitat was mapped in the following vegetation communities: – Mature open woodland vegetation dominated by *Eucalyptus/Corymbia* and *Acacia* open woodland on alluvial soils and plains and low stony rises on downs. – Mature open woodland vegetation along freshwater creek lines and drainage lines. These communities contain the open woodland required for ambush hunting as these areas are more likely to support biologically rich populations of birds and room for the red goshawk to manoeuvre and hunt.

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Black-throated finch (southern) (*Poephila cincta cincta*)	**Habitat critical to the survival of the species:** There is no specific definition of habitat critical to the survival of this species. In lieu of this, the following critical habitat description has been provided from a review of the *Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta)* (DEWHA, 2009); the *National recovery plan for the black-throated finch southern subspecies (Poephila cincta cincta)* (Black-throated Finch Recovery Team et al. 2007) and the SPRAT profile for the species (DCCEEW, 2023c). The species requires three key resources within its range: suitable nesting trees, suitable foraging resources, and daily access to water (DEWHA, 2009). The species nest within 400 m of permanent water sources (DCCEEW, 2023c) and it is likely that these areas (and the habitat surrounding these areas) provide refuge for the species during the dry season, especially during drought years (DCCEEW, 2023c). Although the species is thought to be sedentary, some local movements are thought to occur in response to drought conditions (Ley and Cook, 2000). Preferred habitats for the species represent open, grassy woodlands and forests, typically dominated by *Eucalyptus, Corymbia* and *Melaleuca* (BTF Recovery Team, 2004; Menkhorst et al., 2019; Pizzey and Knight, 1999). The species is thought to require a mosaic of different habitats in which it can forage year round (Mitchell, 1996). Of particular importance are grasses which seed in the early wet season, with a critical foraging resource bottleneck thought to occur in November – December, when existing fallen seed germinates, but new seed has yet to be produced (NRA, 2007). Preferred foraging species including sabi grass (*Urochloa mosambicensis**), *Enteropogon acicularis*, red natal grass (*Melinis repens**), native panic (*Panicum decompositum*), hairy panic (*Panicum effusum*), Queensland bluegrass (*Dichanthium sericeum*), love grass (*Eragrostis sororia*) and kangaroo grass (*Themeda triandra*) (Mitchell, 1996; NRA, 2007). The presence of grass species which produce seed early in the wet season are likely to be essential for the species (DEWHA, 2009).	**Critical nesting habitat:** This habitat was mapped within mature open woodland vegetation communities dominated by Eucalyptus/Corymbia and *Acacia* spp. on any soil type within 400 m of the southern bank of the Burdekin River. These vegetation communities provide foraging resources, are in close proximity to water and nesting trees. Grasses on which the species forages, including *Themeda triandra* (kangaroo grass) and *Melinis repens** (red natal grass) were confirmed present from field surveys within this area. **Critical foraging habitat:** Foraging habitat was mapped in the following vegetation communities: – *Eucalyptus/Corymbia*/*Acacia* open woodland on alluvial soils and plains and low stony rises on downs *Eucalyptus/Corymbia* woodland on rocky rises and hills. – Mature open woodland vegetation along freshwater creek lines and drainage lines. These communities were considered critical foraging habitat as preferred food grass species were dominant in these areas as determined from the field surveys. These species included *Themeda triandra* (kangaroo grass) and *Melinis repens** (red natal grass). The communities were also located in close proximity to drinking sites provided by ephemeral and permanent watercourses. **Foraging habitat:** Foraging habitat that is not critical to the survival of the species was mapped in the vegetation community below: – Historically cleared vegetation with emergent Eucalypts and scattered *Acacia* regrowth. These areas were located immediately adjacent to or completely surrounded by mature vegetation, that has been mapped as habitat critical to the survival of the species. This vegetation community provides sub-optimal habitat due to a local absence of mature trees, however still contains a local abundance of food grass species as described above.

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Squatter pigeon (southern) (*Geophaps scripta scripta*)	**Habitat critical to the survival of the species:** No formal definition of habitat critical to the survival of the species has been developed for the squatter pigeon (southern). Therefore squatter pigeon (southern) habitat has been defined based on the formal habitat definition in the Commonwealth listing advice for the species (DCCEEW 2023b). Habitat is generally defined as open-forests to sparse, open-woodlands and scrub that are (DCCEEW 2023b; Squatter Pigeon Workshop 2011): – Mostly dominated in the overstorey by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species – Remnant, regrowth or partly modified vegetation communities, and – Within 3 km of water bodies or courses. **Breeding habitat:** Occurs on stony rises occurring on sandy or gravelly soils, within 1 km of a permanent waterbody (Squatter Pigeon Workshop 2011). **Foraging habitat:** Any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species, on sandy or gravelly soils, within 3 km of a permanent or seasonal waterbody (Squatter Pigeon Workshop 2011).	No breeding habitat was confirmed present during field surveys as no stony rises on sandy or gravelly soils within 1 km of a permanent waterbody were identified. **Critical foraging habitat:** Foraging habitat was mapped in the following vegetation communities: – Eucalyptus/Corymbia/*Acacia* open woodland on alluvial soils and plains and low stony rises on downs. – *Eucalyptus/Corymbia* woodland on rocky rises and hills Mature open woodland vegetation along freshwater creek lines and drainage lines. These communities were considered critical foraging habitat as they contain open woodland areas dominated by *Eucalyptus, Corymbia*, *Acacia* on sandy or gravelly soils and are located within 3 km of a permanent or seasonal watercourses in the form of creek lines and drainage lines. **Foraging habitat:** Foraging habitat that is not critical to the survival of the species is mapped within the vegetation community below: – Historically cleared vegetation with emergent Eucalypts and scattered *Acacia* regrowth. These areas were located immediately adjacent to or completely surrounded by mature vegetation that has been mapped as habitat critical to the survival of the species. This vegetation community provides sub-optimal habitat due the local absence of mature trees, however still contains a high density of foraging groundcover species and are located within 3 km of permanent or seasonal watercourses.

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Koala (*Phascolarctos cinereus*)	**Habitat critical to the survival of the species:** Habitat critical to the survival of the koala has not been defined. Therefore critical habitat to the survival of the koala habitat has been defined using the broad criteria used to define habitat critical to the survival of species under the EPBC Act, as outlined in the Commonwealth approved *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory* (DCCEEW, 2022b) and National Recovery Plan for the koala (DCCEEW, 2022g). This considers habitat critical to the survival of the species is likely to include areas that are important refuges during times of stress, provide essential life cycle requirements, habitat that is intensively used by important populations, habitat important for maintaining genetic diversity and long-term evolutionary development, habitat that provides important movement corridors or habitat important for maintaining the long-term future of the species. Within the inland context, riparian woodland is particularly important, as a drought refuge, a source of high-nutrient foraging habitat and as corridors critical for facilitating koala movement within low rainfall inland areas. In general terms, koala habitat includes forests or woodlands, roadside and rail vegetation and paddock trees, safe intervening ground matrix for travelling between trees and patches to forage and shelter and reproduce and access to vegetated corridors or paddock trees to facilitate movement between patches. These resources fall within individual koala's home ranges and allow for interaction with adjacent individuals.	**Critical breeding and foraging habitat:** As critical breeding and foraging habitat has not been segregated for the koala in the literature, it has been combined and has been mapped in the following vegetation communities: – Mature open woodland vegetation dominated by *Eucalyptus/Corymbia* and open woodland on alluvial soils and plains and low stony rises on downs within 250 m of the southern bank of the Burdekin River. This habitat is considered critical to the survival of the species as it contains nutrient-rich foraging resources, local drought refuge and a corridor for koala movement. **Breeding and foraging habitat:** Habitat for the koala that is not critical to the survival of the species has been mapped in the following vegetation communities: – *Eucalyptus/Corymbia/Acacia* open woodland on alluvial soils and plains and low stony rises on downs (beyond 250 m of the Burdekin River). – *Eucalyptus/Corymbia* woodland on rocky rises and hills. – Mature open woodland vegetation along freshwater creek lines and drainage lines. – Historically cleared vegetation with emergent Eucalypts and scattered *Acacia* regrowth. This habitat is not considered critical due to the increased distance from a permanent water source (and associated lower density of food and shelter trees and likely lower nutrient levels in the soil, however is still considered habitat for the koala.

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Greater glider (northern) (*Petauroides minor*)	**Habitat critical to the survival of the species:** Habitat critical to the survival of the greater glider (northern) has been defined based on the formal habitat definition in *Conservation Advice for Petauroides minor (greater glider (northern))* (DCCEEW, 2022f) and in the *Guide to greater glider habitat in Queensland* (Eyre 2022). This habitat includes (DCCEEW, 2022f): – Large, contiguous and diverse areas of Eucalypt forest containing mature hollow-bearing trees. – Fragmented habitat connected to larger patches for dispersal. – Cool temperature microclimate forest/woodland areas, including watercourses and gullies. – Refuges identified under future climate change scenarios. – Unburnt habitat within or adjacent to recently burnt landscapes that act as refuges for the species. **General habitat requirements:** Eucalypt forests and woodlands, occurring in highest abundance in taller, montane, moist Eucalypt forests with relatively old trees and abundant hollows (DCCEEW, 2022f). The species dens in large hollows (diameter >10 cm) in mature trees (DCCEEW, 2022f). The greater glider (southern and central) has been most frequently recorded feeding on trees including, *Corymbia citriodora*, *C. intermedia*, *Eucalyptus fibrosa*, *E. moluccana* and *E. portuensis*, with *C. citriodora* and *E. tereticornis* being important species in greater glider habitat (Eyre et al., 2022). Greater gliders have a relatively small home range, typically 1-4 ha (DCCEEW, 2022h). Studies revealed that the occupation of a small (< 3 ha) home range is consistent throughout the species Australian geographic range, and therefore, small patches should not be dismissed as important habitat especially if connected to other patches of habitat (Eyre et al., 2022).	**Critical denning and foraging habitat:** Critical denning and foraging habitat has been combined for the Initial Works and includes the following vegetation communities: – Mature open woodland vegetation dominated by *Eucalyptus/Corymbia* and *Acacia* on alluvial soils and plains and low stony rises on downs. – Mature open woodland vegetation along freshwater creek lines and drainage lines. These vegetation communities contain abundant mature hollow bearing Eucalypt and Corymbia trees for denning and foraging that are at least 3 ha in size and include the gully habitat along the freshwater creek lines and some drainage lines. Much of the regrowth vegetation within the Initial Works footprint was not considered to provide habitat for the greater glider (northern) as these areas did not retain any old-growth hollow-bearing trees that would provide potential den sites and generally had low tree densities with gaps exceeding the species' maximum gliding distance.

Species	Habitat description in Commonwealth / State listing advice	Criteria used to map habitat critical to the survival of the species
Migratory fauna		
Fork-tailed swift (*Apus pacificus*)	**Important habitat:** The significance of impact on migratory species is considered based on the impact on 'important habitat' for the species. Important habitat is considered to include habitat used by the species in an area that supports an ecologically significant proportion of the species' population, (i.e. >1% of the species' population, which in the case of the fork-tailed swift is 1,000 individuals). Important habitat can also be areas of critical importance to a particular life-cycle stage, areas near the edge of the species range or habitat in an area where the species is declining (DCCEEW, 2023h). Fork-tailed swift habitat in Australia represents non-breeding habitat only. The fork-tailed swift is almost exclusively aerial, flying from less then 1 m to at least 300 m above ground and probably much higher. The species' habitat requirements are relatively broad, mostly occurring over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. The sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins, 1999). They forage aerially, up to hundreds of metres above ground, but also less then 1 m above open areas or over water (DCCEEW, 2023h). They probably roost aerially, but are occasionally observed to land (Higgins 1999), cited in DCCEEW, 2023h).	**Foraging habitat:** Foraging habitat has been mapped within the following vegetation communities: – Mature open woodland vegetation dominated by *Eucalyptus/Corymbia* and *Acacia* on alluvial soils and plains and low stony rises on downs. – Mature open woodland vegetation along freshwater creek lines and drainage lines. These vegetation communities provide riparian woodlands and open woodland habitat for foraging and have the potential to support roosting in the mature Eucalypt and Corymbia trees that dominate these communities. While the habitat in the Initial Works footprint is consistent with foraging habitat for the fork-tailed swift, this is unlikely to represent important habitat, as it is unlikely to support an ecologically significant proportion of the species The habitat definition is relatively broad and the habitats in the Initial Works footprint are therefore unlikely to represent an area of critical importance to a life-cycle stage.
Satin flycatcher (*Myiagra cyanoleuca*)	**Important habitat:** As detailed above, the significance of impact on migratory species is considered based on the impact on 'important habitat' for the species. Important habitat is considered to include habitat used by the species in an area that supports an ecologically significant proportion of the species' population, (i.e. >1% of the species' population, which in the case of the satin flycatcher is 17,000 individuals) (DCCEEW 2023h). Important habitat for the satin flycatcher has been considered to include Eucalypt forest and woodlands, at high elevations when breeding. They are particularly common in tall wet sclerophyll forest, often in gullies or along water courses (DCCEEW 2023h). The species inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests (Blakers et al. 1984; Emison et al. 1987; Officer 1969), cited DCCEEW 2023h). The satin flycatcher predominantly breeds in the south-eastern Australia and moves to north Queensland and Papua New Guinea during the winter months.	**Important foraging habitat:** Foraging habitat for this species has been mapped in the following vegetation community: – Mature open woodland vegetation along freshwater creek lines and drainage lines. This vegetation community provides the riparian habitat that includes heavily vegetated gullies in eucalypt dominant woodlands utilised by this species. While these areas are likely to visited during the non-breeding season only, they are likely to provide important winter foraging habitat and would constitute important habitat on that basis.

Appendix C

Environmental Desktop Searches

EPBC Act Protected Matters Report

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

Report created: 01-Dec-2022

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	20
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

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

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species			[Resource Information]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.			
Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrura gouldiae Gouldian Finch [413]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area	In feature area
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mesembriomys gouldii rattoides			
Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides minor			
Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat may occur within area	In feature area
Rhinolophus robertsi			
Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Saccolaimus saccolaimus nudicluniatus			
Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Acacia crombiei			
Pink Gidgee [10927]	Vulnerable	Species or species habitat may occur within area	In feature area
Cycas platyphylla			
a cycad [55796]	Vulnerable	Species or species habitat may occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tephrosia leveillei			
[16946]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
REPTILE			
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundo rustica](#) Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Poison Lake	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Powerlink Queensland Genex Kidston Connection Project	2021/9060		Post-Approval	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
NORNICO Tri-Metal Project, Qld	2012/6304	Not Controlled Action	Completed	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828329 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 1 Plan: CLK17

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828346 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 1 Plan: SP103591

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828348 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 1 Plan: SP296888

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828340 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 2 Plan: SP282323

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828327 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 11 Plan: CLK26

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828337 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 12 Plan: CLK26

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828334 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 20 Plan: CLK26

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50828344 EMR Site Id: 14 December 2022
This response relates to a search request received for the site:
Lot: 141 Plan: SP272220

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

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SEARCH RESPONSE
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 50831352 EMR Site Id: 09 January 2023
This response relates to a search request received for the site:
Lot: 155 Plan: CP895491

EMR RESULT

The above site is NOT included on the Environmental Management Register.

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

All search responses include particulars of land listed in the EMR/CLR when the search was generated.
The EMR/CLR does NOT include:-

1. land which is contaminated land (or a complete list of contamination) if DES has not been notified
2. land on which a notifiable activity is being or has been undertaken (or a complete list of activities) if DES has not been notified

If you have any queries in relation to this search please email emr.clr.registry@des.qld.gov.au

Administering Authority

Cultural Heritage Database and Register Search Report

Search report reference number: 124861

The Aboriginal and Torres Strait Islander Cultural Heritage Database (cultural heritage database) and Aboriginal and Torres Strait Islander Cultural Heritage Register (cultural heritage register) have been searched in accordance with the location description provided, and the results are set out in this report.

The cultural heritage database is intended to be a research and planning tool to help Aboriginal and Torres Strait Islander parties, researchers, and other persons in their consideration of the cultural heritage values of particular areas.

The cultural heritage register is intended to be a depository for information for consideration for land use and land use planning, and a research and planning tool to help people in their consideration of the Aboriginal cultural heritage values of particular objects and areas.

Aboriginal or Torres Strait Islander cultural heritage which may exist within the search area is protected under the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003* (the Cultural Heritage Acts), even if the Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (the Department) has no records relating to it.

The placing of information on the database is not intended to be conclusive about whether the information is up-to-date, comprehensive or otherwise accurate.

Under the Cultural Heritage Acts, a person carrying out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal or Torres Strait Islander cultural heritage. This applies whether or not such places are recorded in an official register and whether or not they are located on private land.

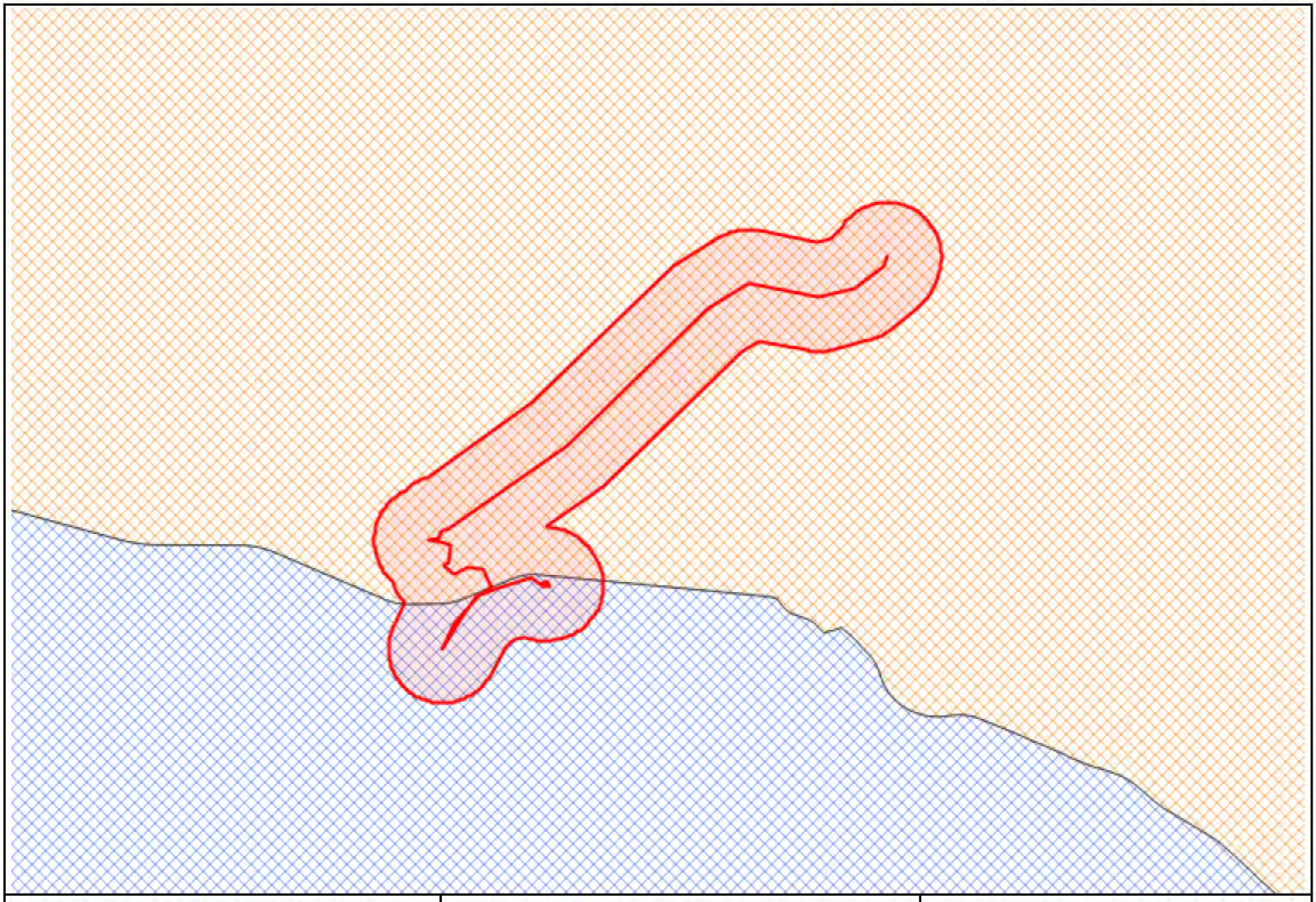
Please refer to the Department website https://www.qld.gov.au/firstnations/environment-land-use-native-title/cultural-heritage/cultural-heritage-duty-of-care to obtain a copy of the gazetted Cultural Heritage Duty of Care Guidelines, which set out reasonable and practicable measure for meeting the cultural heritage duty of care.

In order to meet your duty of care, any land-use activity within the vicinity of recorded cultural heritage should not proceed without the agreement of the Aboriginal or Torres Strait Islander Party for the area, or by developing a Cultural Heritage Management Plan under Part 7 of the Cultural Heritage Acts.

The extent to which the person has complied with Cultural Heritage Duty of Care Guidelines and the extent the person consulted Aboriginal or Torres Strait Islander Parties about carrying out the activity – and the results of the consultation – are factors a court may consider when determining if a land user has complied with the cultural heritage duty of care.

Should you have any further queries, please do not hesitate to contact the department via email: cultural.heritage@dsdsatsip.qld.gov.au or telephone: 1300 378 401.

Cultural Heritage Database and Register Search Report



LEGEND

- CH Parties
- CH Bodies
- CHMPs
- Study Areas
- DLAs

Reference Number: 124861

Search Type: Polygon

Buffer Distance: 1000m

Cultural Heritage Sites

- Pre-2015 Point Site
- Post-2015 Point Site
- Mitigated Point Site
- Pre-2015 Area Site
- Post-2015 Area Site
- Mitigated Area Site

Map Projection: Geographic Latitude & Longitude (GDA2020).

The Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships (DSDSATSIP) is the custodian of spatial data provided by various third parties for inclusion in the Aboriginal and Torres Strait Islander cultural heritage online portal. This includes spatial data provided by the National Native Title Tribunal and Aboriginal and Torres Strait Islander parties.

Features shown on this map have been obtained from available sources. It is possible that errors and omissions may exist. The DSDSATSIP disclaims any liability for any errors or omissions that appear in this document.

Map produced by the Cultural Heritage Unit, DSDSATSIP, Brisbane, Queensland, Australia on 2 December 2022.

Queensland Government

1:114,662

Metres 2,000 4,000

LOCALITY

Search report generated on Dec 2, 2022, 12:50 PM

Cultural Heritage Database and Register Search Report

There are no Aboriginal or Torres Strait Islander cultural heritage site points recorded in your specific search area.

There are no Aboriginal or Torres Strait Islander cultural heritage site polygons recorded in your specific search area.

Cultural Heritage Party/ies for the area:

Reference No.	Federal Court No.	Name	Contact Details
QC2019/003	QUD777/2019	Gugu Badhun People #3	[redacted]
QCD2012/002 DET	QUD85/2005	Gugu Badhun People #2	[redacted]

There are no Cultural Heritage Bodies recorded in your specific search area.

There are no Cultural Heritage Management Plans recorded in your specific search area.

There are no Designated Landscape Areas (DLA) recorded in your specific search area.

There are no Registered Cultural Heritage Study Areas recorded in your specific search area.

There are no National Heritage Areas (Indigenous values) recorded in your specific search area.

Glossary

Cultural Heritage Body: An entity registered under Part 4 of the Cultural Heritage Acts as an Aboriginal or Torres Strait Islander cultural heritage body for an area. The purpose of a cultural heritage body is to:

- identify the Aboriginal or Torres Strait Islander parties for an area
- serve as the first point of contact for cultural heritage matters.

Cultural Heritage Management Plan (CHMP): An agreement between a land user (sponsor) and Traditional Owners (endorsed party) developed under Part 7 of the Cultural Heritage Acts. The CHMP explains how land use activities can be managed to avoid or minimise harm to Aboriginal or Torres Strait Islander cultural heritage.

Cultural Heritage Party: Refers to a native title party for an area. A native title party is defined as:

- Registered native title holders (where native title has been recognised by the Federal Court of Australia).
- Registered native title claimants (whose native title claims are currently before the Federal Court of Australia).
- Previously registered native title claimants (the 'last claim standing') are native title claims that are no longer active and have been removed from the Register of Native Title Claims administered by the National Native Title Tribunal. Previously registered native title claimants will continue to be the native title party for that area providing:
    - there is no other registered native title claimant for the area; and
    - there is not, and never has been, a registered native title holder for the area.

The native title party maintains this status within the external boundaries of the claim even if native title has been extinguished.

Cultural heritage site points (pre 2015): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data **before** 1 July 2015.

Cultural heritage site points (post 2015): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data **after** 1 July 2015.

Cultural heritage site points (post 2015 mitigated): Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as point data after 1 July 2015 where the recorder has advised the department that the site has been mitigated.

Cultural heritage site polygons: Aboriginal and Torres Strait Islander cultural heritage sites and places recorded in the database as a polygon.

Designated Landscape Areas (DLA): Under the repealed *Cultural Record (Landscapes Queensland and Queensland Estate) Act 1987*, an area was declared a 'designated landscape area' (DLA) if it was deemed necessary or desirable for it to be preserved or to regulate access.

Indigenous Protected Areas (IPA): Areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation through voluntary agreements with the Australian Government. For further information about IPAs visit https://www.environment.gov.au/land/indigenous-protected-areas

National Heritage areas: Places listed on the National Heritage List for their outstanding heritage significance to Australia and are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. For further information about the National Heritage List visit https://www.environment.gov.au/heritage/about/national

National Heritage Areas (Indigenous values): Places listed on the National Heritage list (Indigenous values) are recognised for their outstanding Indigenous cultural heritage significance to Australia and are protected under the *Environment Protection and Biodiversity Conservation Act 1999.* These areas are now included in the cultural heritage

register.

Registered Cultural Heritage Study Areas: Comprehensive studies of Aboriginal and or Torres Strait Islander cultural heritage in an area conducted under Part 6 of the Cultural Heritage Acts for the purpose of recording the findings of the study on the register.

Traditional Use of Marine Resources Agreement (TUMRA): Areas subject to agreement between Great Barrier Reef Traditional Owners and the Australian and Queensland governments on the management of traditional use activities on their sea country. For further information about TUMRAs visit https://www.gbrmpa.gov.au/our-partners/traditional-owners/traditional-use-of-marine-resources-agreements

World Heritage Areas: Places inscribed on the World Heritage List pursuant to the World Heritage Convention adopted by the United Nations Education, Scientific and Cultural Organisation (UNESCO) and are protected under the *Environment Protection and Biodiversity Conservation Act 1999*. For further information about World Heritage places in Queensland visit https://parks.des.qld.gov.au/management/managed-areas/world-heritage-areas

Disclaimer: *The Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships is the custodian of spatial data and information provided by various third parties for inclusion in the Aboriginal and Torres Strait Islander cultural heritage online portal. This includes spatial data provided by the National Native Title Tribunal and Aboriginal and Torres Strait Islander parties. Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships is not responsible for the accuracy of information provided by third parties or any errors in this search report arising from such information.*