# **Appendix L** NRA - Environmental Analysis Report (EAR)



# Haughton Pipeline Stage 2 Project: Environmental Analysis Report

GHD (on behalf of Townsville City Council)

# **Document Control Summary**

NRA Filepath:	F:\AAA\135_TNS\135037.00-GHD Haughton Pipeline Stage 2\Rpt\TCC HP2_EAR_R02.docx					
Status:	R02         Date of Issue:         27 August 2021					
Project Manager:	Rhiannon Williams					
Title:	Haughton Pipeline Stage 2 Project: Environmental Analysis Report					
Client:	GHD (on behalf of Townsville City Council)					
Client Contact:	Rebecca Peardon, Senior Planner					
Copies Dispatched:	1 PDF					
Other Info or Requirements:	R02 report supersedes and replaces all previous documentation prepared.					

#### NRA Environmental Consultants

	Report Summary				
	Haughton Pipeline Stage 2 Project, Townsville City Council, TCC,				
Key Words	Flora and Fauna Survey, Environmental Approvals, Environmental				
	Analysis Report, EAR				
Abstract	Townsville City Council proposes to construct a pipeline from south				
	of the Haughton River to the Burdekin River, and a pump station				
	(near the Burdekin River). This report describes the proposed project,				
	environmental values, potential impacts and mitigation measures.				

 
 Citation

 This report should be cited as: NRA 2021, Haughton Pipeline Stage 2 Project: Environmental Analysis Report, R02, prepared by NRA Environmental Consultants for GHD (on behalf of Townsville City Council), 27 August 2021.

Quality Assurance					
Author	Technical Review	Editor	Document	Approved for Issue by QA Manager	
			version	Date	Signature
Rhiannon Williams MRes,	Peter Buosi BAppSc(Hons); Tim Anderson MAgrSc, BAgrSc(Hons), CPESC (#2723), CEnvP (#002)	Kirsty Anderson BA(Hons)	R01	15/7/2021	Killer
BSc(Hons)	Peter Buosi BAppSc(Hons)		R02	27/8/2021	Killen

© Natural Resource Assessments Pty Ltd

This document is the property of Natural Resource Assessments Pty Ltd. Apart from any use as permitted under the Copyright Act 1968 all other rights are reserved. Unauthorised use of this document in any form whatsoever is prohibited.



#### Limitations of this Report

The information in this report is for the exclusive use of GHD and Townsville City Council, the only intended beneficiaries of our work. NRA cannot be held liable for third party reliance on this document. This disclaimer brings the limitations of the investigations to the attention of the reader. The information herein could be different if the information upon which it is based is determined to be inaccurate or incomplete. The results of work carried out by others may have been used in the preparation of this report. These results have been used in good faith, and we are not responsible for their accuracy. The information herein is a professionally accurate account of the site conditions at the time of investigations; it is prepared in the context of inherent limitations associated with any investigation of this type. It has been formulated in the context of published guidelines, legislation in force at the date of this report, field observations, discussions with site personnel, and results of laboratory analyses. Any change to published guidelines or legislation may change the opinions of NRA expressed in this document. NRA's opinions in this document are subject to modification if additional information is obtained through further investigation, observations or analysis. They relate solely and exclusively to environmental management matters, and are based on the technical and practical experience of environmental practitioners. They are not presented as legal advice, nor do they represent decisions from the regulatory agencies charged with the administration of the relevant Acts. Any advice, opinions or recommendations contained in this document should be read and relied upon only in the context of the document as a whole and are considered current as of the date of this document.

# **Table of Contents**

Glos	sary.			i				
1.	Intro	oduction1						
	1.1	Backgro	bund	1				
	1.2	Report	scope	1				
2.	Proje	ect Desc	ription	2				
	2.1	Overvie	w	2				
	2.2	Constru	ction	2				
3.	Proje	ect Area		4				
	3.1	Location	٦	4				
	3.2	Project	area	4				
	3.3	Tenure		4				
	3.4	Infrastru	ucture and utilities	4				
	3.5	Land us		4				
	3.6	Protecte	ed areas					
	37	Climate		5				
4	Fxist	ting Fnv	ironment					
	∠ 1 1	Soil and	I topography	7				
	4.1	4.1.1	Methods	7				
		4.1.2	Description of environmental values	7				
		4.1.3	Potential impact and mitigation measures	9				
	4.2	Waterco	ourses and waterways	12				
		4.2.1	Methods	12				
		4.2.2	Description of environmental values	12				
		4.2.3	Potential impact and mitigation measures	14				
	4.3	Wetland	ds	18				
		4.3.1	Methods	18				
		4.3.2	Description of environmental values	18				
		4.3.3	Potential impact and mitigation measures	19				
	4.4	Flora		21				
		4.4.1	Methods	21				
		4.4.2	Description of environmental values	21				
		4.4.3	Potential impact and mitigation measures	30				
	4.5	Fauna.		31				
		4.5.1 4.5.2	Nethods	31				
		4.3.Z	Description of environmental values	ა∠ ⊿ე				
	16			42 10				
	4.0	Air and		40				

	4.6.1	Methods	46
	4.6.2	Description of environmental values	46
	4.6.3	Potential impact and mitigation measures	46
5.	State and C	ommonwealth Legislation	48
6.	Conclusion		49
7.	References.		50

#### Tables

Table 1:	Dominant soil types and soil class profiles in the Project area	8
Table 2:	Field observation of watercourses and waterways	. 13
Table 3:	REs mapped by the Queensland Government to occur in the Project area	. 25
Table 1:	Woods of management concern observed in the Project area	

### Graphs

- Graph 1: Mean monthly rainfall and maximum and minimum temperatures (1951–2021) recorded at the Ayr DPI Research Station (33002)..... 5

#### Figures

Figure 1: Location of the Haughton Pipeline Stage 2 Project	6
Figure 2: Soil types mapped by the Queensland Government	11
Figure 3: Assessment sites and Watercourse Identification Map	16
Figure 4: Waterways for waterway barrier works	17
Figure 5: Wetlands of high ecological significance and wetland protection area trigger areas	on 20
Figure 6: Vegetation assessment sites and Regional Ecosystems mappe by the Queensland Government	ed 26
Figure 7: Essential habitat map	39
Figure 8: Potential roosting habitat for Bare-rumped Sheathtail Bat	40
Figure 9: Potential habitat for Black-throated Finch	41

#### Appendices

- Appendix A: EPBC Act Protected Matters Search Report
- Appendix B: Queensland Government Wetland Mapping
- Appendix C: Directory of Important Wetlands Australia Listings
- Appendix D: Protected Plants Trigger Map
- Appendix E: Matters of State Environmental Significance Environmental Report
- Appendix F: Wildlife Online Database Search
- Appendix G: Flora and Fauna Species List
- Appendix H: Vegetation Assessment Proformas
- Appendix I: Likelihood of Occurrence Assessment
- Appendix J: Abundance of Weeds of Management Concern
- Appendix K: Potentially Relevant State and Commonwealth Legislation

# Glossary

ADR	Accepted Development Requirement
PD Status	Biodiversity Status of Regional Ecosystems according to the Queensland
BD Status	Department of Environment and Science
BHWSS	Burdekin Haughton Water Supply Scheme
<b>Biosecurity Act</b>	Queensland Biosecurity Act 2014
BSC	Burdekin Shire Council
BVG	Broad Vegetation Group
DIWA	Directory of Important Wetlands in Australia
EAR	Environmental Analysis Report
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ESCP	Erosion and Sediment Control Plan
Fisheries Act	Queensland Fisheries Act 1994
GBR	Great Barrier Reef
GHD	GHD Pty Ltd
HES	High ecological significance (wetland)
IWSS	Integrated Water Supply Strategy
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Queensland Nature Conservation Act 1992
NRA	NRA Environmental Consultants
RE	Regional Ecosystem
RPMS BDT	Regional Pest Management Strategy Burdekin Dry Tropics
T&NT	Threatened and Near Threatened
TCC	Townsville City Council
TEC	Threatened Ecological Community
VM Act	Queensland Vegetation Management Act 1999
Water Act	Queensland Water Act 2000
WoNS	Weeds of National Significance
WPA	Wetland Protection Area
WWBW	Queensland Waterways for Waterway Barrier Works

# 1. Introduction

# 1.1 Background

Townsville City Council (TCC) is progressing plans for the Haughton Pipeline Stage 2 Project (the Project) to accommodate regional growth and increased water demand amid potential prolonged drought conditions. Stage 1 (the Haughton Pipeline Duplication Project) was completed in June 2020. Stage 1.1, to extend the pipeline approximately 4 km south across the Haughton River, is close to completion.

NRA Environmental Consultants (NRA) was commissioned by GHD Pty Ltd (GHD) on behalf of TCC to establish the environmental constraints of the Project through an Environmental Analysis Report (EAR).

The Project will have design, construction and operation phases. The design phase involves surveys along the proposed alignment and development of detailed design plans. The construction phase involves early works to establish access to and along the pipeline alignment, construction of the pipeline (using a 40 m wide corridor along the alignment, narrower corridor at watercourse crossings, and access tracks), and rehabilitation of most disturbed areas. The operation phase will involve maintenance inspections and repair works (where needed) along the pipeline alignment, with access via designated access tracks.

# 1.2 Report scope

The most disturbance will occur during the construction phase of the project; therefore, the impact assessment and mitigation measures in this EAR have been prepared for the construction phase.

The scope of the EAR is to:

- describe the proposed work
- describe Commonwealth and State legislative obligations
- describe the existing natural environment in the Project area from desk-based and field studies
- discuss potential impacts of proposed work on the environment
- asses the likely impacts
- provide measures to avoid or minimise impacts.

A desk-based assessment and field survey were undertaken to collect data to inform the EAR.

The identification of environmental values in the receiving environment, and advice relating to the potential threats, mitigation measures and regulatory requirements associated with the proposed works provided in this report, are based on Project information provided by GHD from January to July 2021 (and described in **Section 2**).

The design process for Stage 2 is ongoing, and refinements to the existing plans are expected prior to construction. NRA understands that the information provided herein will be reviewed, and supplementary studies (desk-based and/or field) conducted, if material changes are made to the Project design as described in this report.

# 2. Project Description

# 2.1 Overview

The Haughton Pipeline began operations in 1988 and forms an important part of Townsville's water supply and water security. Prior to Stage 1, the Haughton Pipeline comprised a pump station at the Upper Haughton that was capable of drawing 130 ML of water per day from the Burdekin Haughton Water Supply Scheme (BHWSS) and transferring it to the Ross River Dam via a 35.6 km pressure and gravity pipeline. Drawdown from the BHWSS was activated when the Ross River Dam water level dropped to 20% capacity.

Projected population growth in the Townsville region and increased demand for water, coupled with climatic modelling that shows a decline in rainfall in the Townsville region, have led to an anticipated greater future reliance on the water supply from the BHWSS.

The following staged works have been undertaken/are proposed by TCC to meet the increasing demand for water.

- Stage 1.
  - In 2019, TCC, through the implementation of TCC's Integrated Water Supply Strategy (IWSS), duplicated the existing Haughton Pipeline to meet increasing demand. The duplicate pipeline is 36.5 km long and is adjacent to the existing pipeline.
- Stage 1.1.
  - Approximately 4 km of pipeline across the Haughton River (south to the beginning of Stage 2) is under construction.
- Stage 2 (this Project).
  - Includes the extension of the existing pipeline from the Stage 1.1 works to a new pump station between the Tom Fenwick pump station and the Clare Weir.

The objective of this Project is to deliver a pump station and a 28.5 km pipeline, capable of transferring 364 ML of water per day from Burdekin River to Ross River Dam.

# 2.2 Construction

The Project will involve construction of the following.

- A buried pipeline (constructed of mild steel cement lined pipework and/or glass reinforced pipework) 1,800 mm in diameter and approximately 28.5 km long; from south of Haughton River (Stage 1.1 works) to Burdekin River.
- Temporary support facilities including laydown areas for materials and equipment.
- A permanent access road along the length of the pipeline (21.5 m wide).
- A pump station, near to the existing Tom Fenwick Pump Station.
- Power supply works including a substation from the Powerlink 132 kV lines, and an 11kV extension and transformer (as an interim supply)<sup>1</sup>.

<sup>&</sup>lt;sup>1</sup> Development approvals associated with the new substation and power supply works will form part of a separate development application to that of the pump station and water supply pipeline (Queensland Government 2021).

For the purposes of this report it is assumed that construction will involve the following key steps.

- Clearing of vegetation and grading of the pipeline alignment to prepare a construction working area for the pipeline, pump station and substation.
- Separating and stockpiling topsoil and subsoil to protect and preserve for later use.
- Creation of a trench for the pipeline using trenching machines and conventional (open cut trench) methods for the majority of the pipeline length. At major infrastructure crossings (road and rail lines) trenchless construction techniques (*eg* enveloper) will be applied.
- Lowering the pipeline into the trench and backfilling the trench with excavated material and replacing topsoil.
- Cleaning up and restoring the construction site, including the rehabilitation of nonoperational areas.

The construction of the Project is expected to commence in mid-2021 and is scheduled to be completed by the end of 2023.

# 3. Project Area

# 3.1 Location

The proposed pipeline alignment is approximately 70 km (from its mid-point) south-east of Townsville. The proposed pipeline will be constructed from Burdekin River (near the existing Tom Fenwick Pump Station), in a north-westerly direction for approximately 28.5 km, to the southern-most point of the Stage 1.1 pipeline (south of Haughton River) (**Figure 1**). The proposed alignment traverses agricultural land for most of its length, with some sections following existing irrigation channels (owned by Sunwater) and powerline easements.

The proposed alignment is in the Burdekin Shire Council (BSC) Local Government Area. Townships in the vicinity of the proposed alignment include Upper Haughton and Clare.

# 3.2 Project area

This EAR was prepared using the proposed alignment provided to NRA on 25 May 2021. The proposed alignment was used as a mid-point for a 200 m wide design corridor (*pers. comm.* Rebecca Peardon, Senior Planner, GHD via email on 20 January 2021) (**Figure 1**); hereafter the Project area.

Preliminary designs are available at this time. Construction works will be limited to a 40 m wide corridor. At watercourses and drainage features the construction corridor will be reduced to a 20 m wide corridor. Most disturbed areas will be rehabilitation and revegetated following construction works. Permanent clearing will be restricted to a 21.5 m wide access road, along the length of the pipeline, for operational and maintenance purposes.

# 3.3 Tenure

Tenures include a mixture of private properties, State controlled land, and local government owned land.

# 3.4 Infrastructure and utilities

Two state controlled roads (Ayr Ravenswood Road and Ayr Dalbeg Road) intersect the Project area as well as a small number of BSC controlled minor roads and road reserve areas. The Project area also traverses a rail corridor, Powerlink easements and several Sunwater owned irrigation channels.

# 3.5 Land use

Land use in the Project area and surrounds is zoned Rural under the Burdekin Shire IPA Planning Scheme (BSC 2011).

The land use in the Project area is mapped by DES (2019a). The majority of the Project area is mapped as 'grazing native vegetation', with smaller areas of 'other minimal use', 'channel/aqueduct', 'irrigated cropping', 'river', 'reservoir/dam' and 'marsh/wetland'. Surrounding land use is mostly 'irrigated cropping' and 'grazing native pasture'. The mapped land uses are consistent with the current land uses of the Project area.

# 3.6 Protected areas

Protected Areas of Queensland represent: areas protected for the conservation of natural and cultural values; and areas managed for production of forest resources, including timber and quarry material. The Project area does not intersect any Protected Areas.

The closest Protected Area is Bowling Green National Park, which is >13 km from the Project area. Bowling Green Bay National Park is a 58,128 ha National Park that protects a diverse range of habitats including forested landscape of the Mount Elliot range and coastal estuaries between Cape Cleveland and Cape Bowling Green. Horseshoe Lagoon Conservation Park is the next closest Protected area, >20 km north-east of the Project area. This 80 ha park contains freshwater wetland systems.

# 3.7 Climate

Data collected at the Ayr DPI Research Station (Bureau of Meteorology Station No. 33002), 35 km north-west of the Project area, is shown on **Graph 1** and is likely to be representative of the weather conditions in the Project area (BoM 2021). This area is in the dry tropics, which typically has a distinct wet season with higher temperatures (nominally November to April) and a dry season with lower temperatures (nominally May to October).



Source: BoM (2021).

Graph 1: Mean monthly rainfall and maximum and minimum temperatures (1951–2021) recorded at the Ayr DPI Research Station (33002)



Recommended print size: A4

# 4. Existing Environment

The construction of the Project has the potential to impact on the existing natural environment. This section of the EAR describes environmental values of the Project area and possible impacts and mitigation measures to avoid or reduce impacts on identified environmental values.

The environmental values considered include:

- soil and topography (**Section 4.1**)
- watercourses and waterways (Section 4.2)
- wetlands (Section 4.3)
- flora (Section 4.4)
- fauna (Section 4.5)
- air and noise (**Section 4.6**).

For each of the environmental values, a desk-based assessment and field survey were conducted to describe the existing conditions and identify potential impacts associated with the proposed Project. The field survey was undertaken on 21 April and 25–26 May 2021. Weather conditions during the first mobilisation of the field survey (21 April 2021) were wet following a period of significant rain, and access within the Project area was restricted<sup>2</sup>. Weather conditions during the second mobilisation of the field survey (25–26 May 2021) were fine and dry, permitting unrestricted access to the Project area.

# 4.1 Soil and topography

### 4.1.1 Methods

Data from the following sources was used to identify the soils in the Project area.

- Soils of the Lower Burdekin Valley, North Queensland: Redbank Creek to Bob's Creek and south to Bowen River (Thompson *et al.* 1990).
- Soils of the Lower Burdekin River Barratta Creek-Haughton River Area, North Queensland (Reid & Baker 1984).
- Queensland government detailed surface geology mapping (DoR 2018).

### 4.1.2 Description of environmental values

The Project area is low-lying and topography is generally flat. Elevation ranges from approximately 25 m to 45 m Australian Height Datum. The majority of the Project area is underlain with alluvium rock, and a small area of granite is present in the centre of the Project area (north of Ayr Ravenswood Road) (DoR 2018).

Soils in the Project area are mapped at a 1:100,000 scale by Thompson *et al.* (1990) and Reid and Baker (1984). The project area contains seven dominant soil types, and 23 different soil profile classes (**Figure 2**, **Table 1**). The most widespread/common soil type in the Project area is *Sand or loam over sodic clay – Sodosols, Kurosols* (approximately 66%). Descriptions of, and limitations associated with, soil profile classes<sup>3</sup>, are described in Thompson *et al.* (1990) and presented in **Table 1**. Nine of the soil class profiles within the Project area are described as susceptible to erosion (4Ucf, 2Dda, 2Dbd, 4Dba, 4Dye, 4Dyg, 4Dyh, 4Dyk and 6Dyj)).

<sup>&</sup>lt;sup>2</sup> The Project area was accessed on-foot from state and BSC controlled roads.

<sup>&</sup>lt;sup>3</sup> Limitations are described in terms of agricultural use; however, most limitations (*eg* erosion risk, flooding potential) are relevant to land disturbance more generally.

Dominant soil type <sup>A</sup>	Soil profile class <sup>A</sup>	Description <sup>B</sup>	Soil limitations <sup>c</sup>	% of Project area <sup>D</sup>
	2Ugc	Grey brown and grey clays with weakly mottled light clay surface, profile alkaline by 90 cm.	- Cilgai flooding waterlogging surface erecting	4.06
	2Ugd	Grey clays with bleached light and light medium clay surface, profile strongly alkaline by 90-120 cm.	Gligar, hooding, waterlogging, surface crusting.	4.40
Cracking clay soils - Vertosols	2Uge	Mottled grey and dark clays with light and light medium clay surface, profile strongly alkaline by 60 cm.	Gilgai, flooding in some areas, waterlogging, surface crusting.	16.23
Cracking cray sons – vertosors	2Ugh	Grey and dark clays with moderately mottled medium to heavy clay surface, profile strongly alkaline by 30 cm.	Gilgai, flooding in some areas, waterlogging.	0.92
	Total			25.61
	4Ucf	Sands and loams from 30–110 cm deep. Often cobbly and gravelly.	Shallow soils, stone, low water retention, erosion, impermeable upper B horizon.	2.01
Deep sandy soils – Tenosols,	6Uca	Deep sands with minimal pedological development.	Soil variability, shallow perched, water tables in some areas,	1.41
Rudosols	6Ucb	Deep bleached sands.	low water retention, flooding.	1.26
	Total		Ť	4.68
Friable non-cracking clay or clay	6Gnd	Neutral yellow brown gradational soils with sandy loam A horizon.	Flooding in some areas, surface crusting.	2.20
loam soils – Dermosols, Ferrosols	Total			2.20
Sand or loam over friable or earthy clay – Chromosols,	6Dya	Mottled yellow podzolic soil with 60 to 120 cm sandy loam A horizon. Bleached A2 horizon.	Soil variability, perched water tables in wet season, low water retention.	0.13
Kurosols	Total			0.13
	2Dbf	Brown solodics-solodized solonetz with 12–25 cm sandy loam A horizon, B horizon alkaline by 60 cm.	Flooding in some areas, waterlogging, impermeable upper B horizon, surface crusting.	1.08
	2Dda	Dark solodics-solodized solonetz with 2.5–12 cm loam to clay loam A horizon, B horizon strongly alkaline by 60 cm.	Soil variability, impermeable upper B horizon, restricted rooting	7.98
	2Ddb	Dark solodics-solodized solonetz with 2.5–12 cm loam to clay loam A horizon, B horizon strongly alkaline by 30 cm.	depth, sheet erosion, surface crusting.	4.54
	2Dyb	Grey and dark solodics-solodized solonetz with 12–20 cm loam to clay loam A horizon, B horizon strongly alkaline by 60 cm.	Flooding in some areas, waterlogging, impermeable upper B horizon, surface crusting.	12.69
	4Dba	Brown solodics-solodized solonetz with 20-25 cm A horizon, B horizon alkaline by 90 cm.		2.64
	4Dye	Grey to yellow solodics-solodized solonetz with 35-40 cm A horizon, B horizon alkaline by 90 cm.	Soil variability, impermeable upper B horizon, restricted rooting	3.18
Sand on loom over and a slov	4Dyg	Grey to yellow solodics-solodized solonetz with 15-30 cm A horizon, B horizon alkaline by 60 cm.	depth, sheet erosion, surface crusting, waterlogging.	1.73
Sand of loam over sodic clay –	4Dyh	Grey to dark brown solodics-solodized solonetz with 15 to 30 cm A horizon, B horizon alkaline by 30 cm.	-	0.24
Souosois, Kulosois	4Dyk	Grey and yellow podzolic soils with 35–100 cm coarse sandy A horizon. Bleached A2 horizon. Overlies decomposed granite.	Slope and erosion, low water retention, soil variability.	1.37
	6Dyb	Mottled yellow soloth with 30-60 cm of sandy loam A horizon. Bleached A2 horizon.	Flooding in some areas, surface crusting.	3.76
	6Dyf	Yellow solodics-solodized solonetz with 25–50 cm sandy clay loam to clay loam A horizon, B horizon alkaline by 120 cm.	Soil variability, impermeable upper B horizon, surface crusting.	2.08
	6Dyg	Yellow, grey and brown solodic-solodized solonetz with 10–20 cm sandy clay loam A horizon, B horizon strongly alkaline by 60 cm.	Surface crusting, waterlogging, soil variability, impermeable upper B horizon.	1.91
	6Dyj	Dark and grey solodics-solodized solonetz with 5–20 cm A horizon, B horizon strongly alkaline by 30 cm.	Flooding and erosion, perched water tables in wet season.	15.39
	6Gnc	Alkaline yellow structured gradational soils with sink hole micro relief.	Sink hole micro relief in some areas, soil variability, dispersion subsoils.	7.14
	Total			65.71
Eroded land – other	Total			1.62
Lagoon	Total			0.05

# Table 1: Dominant soil types and soil class profiles in the Project area

<sup>A</sup> As per Thompson *et al.* (1990) and Reid and Baker (1984). Dominant soil types are mapped on **Figure 2**.

<sup>B</sup> As per Table 1 in Thompson *et al.* (1990).

<sup>C</sup> As per Table 2 in Thompson *et al.* (1990). Limitations are described in terms of agricultural use; however, most limitations (*eg* erosion risk, flooding potential) are relevant to land disturbance more generally.

<sup>D</sup> Percentage of total Project area represented by each dominant soil type/soil class profile. Data subject to rounding errors.

# 4.1.3 Potential impact and mitigation measures

The potential impacts to soils due to the Project are as follows.

- Soil degradation from disturbances (*eg* vegetation clearing, soil stripping) increases the risk of soil erosion.
- Soil erosion may be accelerated by poor or unmanaged drainage of disturbed areas, and large volumes of fast flowing water will erode disturbed soils that are otherwise stable.
- Fine sediment exported from disturbed soils can impact on water quality of nearby water features (*eg* streams and wetlands), particularly those downstream of the disturbance.
- Contamination of soils with waste materials/hazardous chemicals.
- Loss of soil or diminished soil quality due to construction works will have a direct impact on flora and fauna values in the Project area and could hinder the re-establishment of vegetation.

All soils in the Project area that will be disturbed by the proposed activity will require appropriate erosion and sediment control measures, and management of the soils should be commensurate with the risk that each soil type poses. Areas containing soils with higher erosion susceptibility will require additional, or more specialised, treatment to avoid adverse impacts during construction.

The following mitigation measures are provided to reduce potential impacts. Construction contractor(s) should prepare a Project-specific Construction Environmental Management Plan (CEMP) as part of pre-construction activities. Measures to address the following recommendations should be included in the Project CEMP (where applicable).

<b>Recommendation 1:</b>	The CEMP should include a Project Clearing Plan (PCP) (or equivalent). The PCP should:				
	• aim to minimise the total disturbance area/footprint as well as the area of soil exposed through disturbance at any time				
	• maximise the use of existing cleared areas				
	• ensure that clearing does not occur beyond approved clearing extents by including a requirement to survey ( <i>eg</i> as part of pre-clearance works) and clearly mark vegetation clearing extents ( <i>ie</i> the width of the construction corridor) to be maintained for the duration of construction				
	• identify and mark large trees with hollows that can be retained ( <i>eg</i> on the edge of the construction corridor)				
	• define controls to prevent unauthorised vegetation clearing ( <i>eg</i> supervision, permissions).				
Recommendation 2:	A site-specific Erosion and Sediment Control Plan (ESCP) (or equivalent) should be developed and implemented by the construction contractor as part of pre-construction activities. The ESCP should be prepared in accordance with industry standards, be prepared by a suitably qualified practitioner, and take into consideration the erosion risk of each soil type. Elements of the ESCP must be integrated into the construction schedule.				
Recommendation 3:	Undertake construction in the dry season and ensure that the beds and banks of disturbed watercourses are stabilised prior to the wet season.				

- **Recommendation 4:** Ensure that appropriate fill is used around the pipeline, so that erosion and subsidence does not become an issue or risk to the asset in the future.
- **Recommendation 5:** Salvaged soil should be directly reused for rehabilitation rather than being stockpiled, with reused soil material to be replaced to reflect its original profile position (*ie* subsoil below surface soil material). Where direct reuse of soil material is not possible, soil material is to be conserved and stockpiled, with surface soil stockpiled separately to subsoil. Soil stockpiles must be located and managed to minimise erosion and revegetated if they are to remain for >4 weeks (in the interim apply mulch or appropriate soil binder).
- **Recommendation 6:** Store chemicals and products in accordance with relevant Australian Standards to reduce the likelihood of soil contamination.
- **Recommendation 7:** Maintain spill kits in areas where hazardous substances are handled, or near machinery with potential for spills, and remediate all hazardous substance spills as soon as practicable.
- **Recommendation 8:** Maintain vehicles and machinery according to manufacturer specifications.
- **Recommendation 9:** Rehabilitate disturbed land as soon as practicable (excluding the 21.5 m wide permanent access road) and in accordance with a Project-specific Rehabilitation Plan (or equivalent). Suitable native plant species should be used in revegetation work. The species composition should be determined in consultation with a suitably qualified practitioner.



Recommended print size: A3

# 4.2 Watercourses and waterways

# 4.2.1 Methods

A desk-based assessment and field survey were conducted to assess the watercourse and waterway values applicable to the Project area. The desk-based assessment included a review of information from the following sources.

- Watercourse Identification Map (DRDMW 2021).
- Vegetation management watercourse/drainage mapping (DoR 2021a).
- Queensland Waterways for Waterway Barrier Works (WWBW) mapping (DAF 2016).
- Queensland Globe aerial imagery (accessed via: <u>https://qldglobe.information.qld.gov.au/qldglobe/</u>).

During the field survey, the presence of watercourses and waterways in the Project area was confirmed and observations were made on the presence of water, and bank stability/condition.

# 4.2.2 Description of environmental values

The environmental values of waterways and watercourses in Queensland are managed through the Queensland *Water Act* 2000 (Water Act), the Queensland *Vegetation Management Act* 1999 (VM Act) and the Queensland *Fisheries Act* 1994 (Fisheries Act).

The Project area is within the Haughton River and Lower Burdekin River sub-basins of the Burdekin Basin.

Watercourses and drainage features are defined in the Water Act. *Watercourses, drainage features* and *unmapped features* are shown on the Watercourse Identification Map (DRDMW 2021), presented on **Figure 3**. The unmapped features in the Project area are ephemeral, and drain to Haughton River (to the north), Barratta Creek and the Burdekin River, which are mapped watercourses.

Fifteen watercourses/drainage features are mapped by DoR (2021a) to intersect the Project area; of these, three have a stream order<sup>4</sup> of five or greater. These include: Scott Creek (5<sup>th</sup> order), Barratta Creek (5<sup>th</sup> order) and Burdekin River (9<sup>th</sup> order). Vegetation associated with watercourses is defined as a Matter of State Environmental Significance (MSES)<sup>5</sup> (regulated vegetation (defined watercourse)). The majority of the watercourse/drainage features assessed did not meet the definition of a watercourse under the Water Act.

WWBW mapping (DAF 2016) identifies 16 waterways intersecting the Project area, comprising one low, six moderate, three high and six major risk waterways (**Figure 4**).

Watercourses (including drainage features and unmapped features) and waterways intersecting the Project area were assessed at 20 sites during the field survey (**Figure 3**). Results of the field observations of watercourses and waterways in the Project area are in **Table 2**.

<sup>&</sup>lt;sup>4</sup> Stream order as defined by Strahler (1957). Smaller numbers are upstream, minor tributaries (closer to the source). Larger numbers are more significant watercourses (farther from the source).

<sup>&</sup>lt;sup>5</sup> Prescribed under the Queensland Environmental Offsets Regulation 2014.

Site ID <sup>A</sup>	Latitude <sup>B</sup>	Longitude <sup>B</sup>	Wetland/linear feature	Туре	Water present	Channel width (m)	Bank erosion	Riparian vegetation description	WIM category <sup>c</sup>	Stream order <sup>D</sup>	WWBW category <sup>E</sup>
WC1	-19.740959	147.085179	Linear feature	Natural; Ephemeral	Yes (standing)	15	Very little	Regional ecosystem (RE) 11.3.25b verified adjacent to watercourse. Riparian zone 20 m wide both sides of channel.	Unmapped	4	Major
WC2	-19.741489	147.085238	Linear feature	Natural; Ephemeral	No	1	Very little	None	Unmapped	-	-
WC3	-19.750146	147.086159	None present	-	-	-	-	-	Unmapped	1	Moderate
WC4	-19.759277	147.088073	None present	-	-	-	-	-	Unmapped	-	-
WC5	-19.792258	147.110937	Linear feature	Natural; Ephemeral	No	5	Very little	No riparian vegetation. RE 11.3.7/11.3.35 verified adjacent to watercourse. Riparian zone 2 m wide both sides of channel.	Unmapped	1	Moderate
WC6	-19.797460	147.115026	Linear feature	Natural; Ephemeral	Yes (standing)	8	Some (signs of pig and cattle)	Lophostemon grandiflora and Melaleuca leucadendra fringing creek line with Arundinella sp.; 2 m wide both sides of channel.	Unmapped	1	-
WC7	-19.800440	147.116712	Linear feature	Natural; Ephemeral	Yes (flowing)	15	Very little	RE 11.3.25b verified adjacent to watercourse. Riparian zone 20 m both sides of channel.	Unmapped	4	Major
WC8	-19.802840	147.118826	Linear feature	Natural; Ephemeral	No	12	None	RE 11.3.25b verified adjacent to watercourse. Riparian zone 15 m both sides of channel.	Watercourse	5 (Barratta Creek)	Major
WC9	-19.804671	147.120139	Wetland	Natural; Ephemeral	No	-	Some (signs of pig and cattle)	Wetland plants: <i>Monochoria vaginalis</i> , <i>Aeschynomene indica</i> , <i>Marsilea</i> sp., <i>Lophostemon grandiflora</i> nearby.	Unmapped	1	-
WC10	-19.805554	147.120866	Linear feature	Natural; Ephemeral	No	4	None	Riparian vegetation: <i>Pandanus</i> sp., <i>Lophostemon</i> grandiflora.	Unmapped	1	Moderate
WC11	-19.820309	147.132975	Linear feature	Natural; Ephemeral	Yes (standing)	5	None	Riparian vegetation: Lophostemon grandiflora and Melaleuca leucadendra.	Unmapped	1	Moderate
WC12	-19.833521	147.136523	Linear feature	Natural; Ephemeral	No	15	Very little	RE 11.3.25b verified adjacent to watercourse. Riparian zone 15 m both sides of channel.	Unmapped	5 (Scott Creek)	Major
WC13	-19.845476	147.142418	Linear feature	Natural; Ephemeral	Yes (standing)	5	None	Aquatic/riparian vegetation: <i>Nymphaea gigantea</i> , Ludwigia sp., Melaleuca viridiflora.	Unmapped	2	High
WC14	-19.863101	147.149475	Linear feature	Natural; Ephemeral	Yes (standing)	5	Some (signs of cattle)	RE 11.3.7 verified adjacent to watercourse. Aquatic plants ( <i>Nymphaea gigantea</i> ).	Unmapped	2	Moderate
WC15	-19.888455	147.191896	Wetland	Natural; Ephemeral	Yes (standing)	-	Some (signs of pig and cattle)	Aquatic vegetation: <i>Nymphaea gigantea</i> , <i>Oryza</i> sp., <i>Ludwigia</i> sp., <i>Marsilea</i> sp. Riparian area 5 m both sides of channel.	Unmapped	1	High
WC16	-19.894905	147.196897	Linear feature	Natural; Ephemeral	Yes (standing)	3	Very little (signs of cattle)	Aquatic vegetation: Nymphaea gigantea, Ludwigia sp.	Unmapped	1	Moderate
WC17	-19.909596	147.206310	Linear feature	Natural; Ephemeral	Yes (standing)	10	None	Aquatic vegetation: <i>Typha domingensis</i> , <i>Ludwigia</i> sp. Riparian area 2 m wide both sides of channel.	Unmapped	-	Low
WC18	-19.916060	147.211611	Linear feature	Natural; Ephemeral	No	10	Very little	Riparian vegetation: <i>Lophostemon grandiflora</i> , <i>Corymbia clarksoniana</i> , <i>Pleiogynium timorense</i> . Riparian zone 15 m wide on both sides.	Unmapped	3	High
WC19	-19.922485	147.213573	Wetland	Artificial; Permanent	Yes (standing)	-	None	Aquatic plants: Aeschynomene indica, Nymphoides indica, Persicaria attenuata.	-	-	Major
WC20	-19.926071	147.218796	Linear feature	Natural; Permanent	Yes (flowing)	350	Very little	RE 11.3.25f/11.3.25b verified adjacent to watercourse. Riparian zone 200 m wide both sides of channel.	Watercourse	9 (Burdekin River)	Major

#### Table 2: Field observation of watercourses and waterways

<sup>A</sup> Site ID as per **Figure 3**.

<sup>B</sup> WGS 84 datum.

<sup>C</sup> Categories mapped on the Watercourse Identification Map (WIM) (administered under the Water Act) (DRDMW 2021) include: watercourse, drainage feature and unmapped. Shown on Figure 3.

<sup>D</sup> Stream orders as mapped on the vegetation management watercourse/drainage mapping (administered under the VM Act) (DoR 2021a).

<sup>E</sup> Categories mapped on the Waterways for Waterway Barrier Works (WWBW) mapping (administered under the Fisheries Act) (DAF 2016) include: low, moderate, high and major risk waterways. Shown on Figure 4.

'-' indicates not applicable.

### 4.2.3 Potential impact and mitigation measures

Watercourses and waterways mapped on the Watercourse Identification Map (DRDMW 2021), vegetation management watercourse/drainage mapping (DoR 2021a) and WWBW mapping (DAF 2016) intersect the Project area. Construction of the Project will involve temporary disturbances to these watercourses and waterways. Potential impacts to the aquatic receiving environment as a result of the Project (before mitigation measures) include the following.

- The transport of sediment laden water into watercourses/waterways due to increased erosion in areas with exposed soils following earthworks and from stockpiles (particularly during rainfall events).
- The release of contaminants (particularly hydrocarbons that are stored in work areas or used in machinery) into watercourses/waterways.
- Reduction in the value of the aquatic receiving environment caused by littering with waste during construction works.
- Reduction in, or alteration of, surface water flow to watercourses/waterways through the modification of drainage.
- Waterway barriers impeding flow and/or migration of fish in mapped *Waterways for Waterway Barrier Works*.

Where possible, the construction activities will be undertaken to meet the accepted development requirements (ADRs) or exemption requirements for works in these areas. All early work activities should avoid watercourses and waterways.

Regulatory approvals or permits for these works may not be required where the Project can meet the requirements in the following documents.

- Accepted development requirements for operational work that is constructing or raising waterway barrier works (DAF 2018).
- *Riverine protection permit exemption requirements (WSS/2013/726)* (DNRME 2019).

Measures to manage the potential Project impacts on watercourses and waterways are provided below (where applicable these should be included in the Project CEMP).

Recommendation 10:	Minimise disturbance to the bed and banks of watercourses/waterways using, where possible, existing disturbed crossings.				
Recommendation 11:	Ensure that pipeline trenching depth across watercourses/waterways is sufficient to avoid exposure of the pipeline as a result of river bed erosion and interference with the low flow of water.				
<b>Recommendation 12:</b>	Maintain buffer zones between soil stockpiles and drainage lines.				
Recommendation 13:	Implement a Project-specific Hazardous Material Storage and Handling Management Plan (or equivalent). This plan will detail how hazardous substances (particularly hydrocarbons used in machinery/vehicle operation) will be handled as per the relevant Australian Standards and away from watercourses/waterways, as required.				
Recommendation 14:	Store waste prior to transport and disposal off-site (including general refuse and hazardous waste) in designated areas away from watercourses/waterways as per the relevant Australian Standards, as required.				

**Recommendation 15:** Obtain relevant development approvals or permits if accepted development and exemption requirements cannot be met, and implement actions to achieve compliance with conditions of the approval/permit.



T:\\_Temp Mapping 2021\135\WOR\135037\135037\_Assess\_210827

#### Recommended print size: A3











# Kilometres

Source:  $\circledast$  State of Queensland (Department of Resources) 2021,  $\circledast$  State of Queensland (Department of Agriculture and Fisheries) 2016. Updated data available at https:// qldspatial.information.qld.gov.au/catalogue/

NRA Ref: 135037 Date: August 2021



T:\\_Temp Mapping 2021\135\WOR\135037\135037\_Barrier\_210827

# 4.3 Wetlands

# 4.3.1 Methods

A desk-based assessment and field survey were conducted to assess the wetland values applicable to the Project area. The desk-based assessment included a review of information from the following sources. During the field survey, the locations of wetlands were confirmed.

- Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) Protected Matters Search Tool (DAWE 2021a). An EPBC Act Protected Matters Report was generated for an area within 20 km of a point central to the Project area (-19.82963, 147.13252) (**Appendix A**).
- Wetland protection area mapping (DES 2020a).
- Wetland data mapping (DES 2019b).
- Queensland Globe aerial imagery (accessed via: <u>https://qldglobe.information.qld.gov.au/qldglobe/</u>).
- Directory of Important Wetlands (DAWE 2021b).

# 4.3.2 Description of environmental values

The environmental values and legislative status of wetlands are assessed at international, national and state scales.

At the international scale, the Convention on Wetlands of International Importance (the Ramsar Convention) is an intergovernmental treaty that promotes national action and international cooperation on the conservation and wise use of wetlands and their resources (DAWE 2021c). At the national scale, the Directory of Important Wetlands in Australia (DIWA) identifies and classifies nationally important wetlands within three broad categories: marine and coastal zone wetlands, inland wetlands, and human made wetlands (DAWE 2021b). Ramsar wetlands are considered Matters of National Environmental Significance (MNES) and are protected under the EPBC Act.

The Queensland Government maps wetlands of high ecological significance (HES) and Wetland Protection Area (WPA) trigger areas (DES 2020a). WPA trigger areas are buffers of up to 500 m in rural areas and 100 m in urban areas that surround HES wetlands within the Great Barrier Reef (GBR) catchment. HES wetlands are MSES and are protected under State legislation.

The Queensland Government (DES 2019b) also maps other wetland values, *ie* marine, estuarine, riverine, lacustrine and palustrine waterbodies, and associated vegetation communities (Queensland Wetland Map, **Appendix B**).

No Ramsar wetlands are present in the Project area or in the immediate receiving environment. Bowling Green Bay Wetland, located (at its closest point) approximately 13 km north-east of the Project area, is a Ramsar wetland and is listed on the DIWA (**Appendix A**, DAWE 2021b).

Two DIWA mapped wetlands are present within, and adjacent to, the Project area (Queensland Wetlands of Importance map, **Appendix B**). The *Haughton Balancing Storage Aggregation - QLD200* is mapped to occur in the north of the Project area. This area was visited during the field survey and standing water was present. This wetland is an artificial wetland (*ie* classified as a human made wetland), which provides water storage for the Haughton Main Channel system. The *Barratta Channels Aggregation - QLD196* is mapped to occur in the centre of the Project area. The mapped area comprises a floodplain with a network of natural channels and drainage depressions extending from its southern extent near the Project area, over 30 km towards the coast. It is classified as both a coastal zone wetland and an inland wetland.

Watercourse assessments undertaken at WC11 and WC12 are within the mapped wetland area (**Figure 3**, **Table 2**). The DIWA listings for these wetlands are provided in **Appendix C**.

No HES wetlands or WPA trigger areas are mapped to occur within the Project area (DES 2020a). The closest mapped HES is approximately 1.1 km west of the Project area (the WPA trigger area for this wetland is 650 m west of the Project area) (**Figure 5**).

DES (2019b) mapping identified the following wetlands that correspond to the mapped watercourses/waterways discussed in **Section 4.2.2**. DES (2019b) mapping is provided in **Appendix B** (Queensland Wetland Map).

- Four riverine wetlands (*ie* WC1, 7, 8 and 12<sup>6</sup> in **Table 2**).
- Three lacustrine wetlands (*ie* WC19 and 20 in **Table 2**, and the *Haughton Balancing Storage Aggregation QLD200* DIWA wetland).

Other non-mapped wetlands were identified during the assessment of mapped watercourses at sites WC9 and 15 (**Figure 3**, **Table 2**).

### 4.3.3 Potential impact and mitigation measures

Surface water in the north of the Project area drains into the Haughton River, which flows east into the Bowling Green Bay Ramsar Wetland. Given the distance of the Project area to this wetland (approximately 13 km), and provided the recommendations below are implemented, it is not likely that Project construction will have significant impact on the Ramsar wetland.

Regulatory approvals or permits are required for activities within a WPA trigger area that meet the definition of 'high impact earthworks' under the Queensland *Planning Regulation* 2017. No construction activities are planned to occur within a WPA trigger area for this Project.

Project construction may involve temporary disturbance of riverine, lacustrine and DIWA wetlands. The following are potential impacts to wetlands in the Project area.

- Reduction in, or alteration of, surface water flow to wetlands through the modification of drainage.
- The transport of sediment laden water into wetlands due to increased erosion in areas with exposed soils following earthworks and from stockpiles.
- The release of contaminants (particularly hydrocarbons that are stored in work areas or used in machinery) into wetlands.
- Reduction in the value of the aquatic receiving environment caused by littering with waste during construction works.

To manage potential impacts to wetland areas, the following mitigation measures are recommended (where applicable these should be included in the Project CEMP). These recommendations are in addition to those already provided.

Recommendation 16: Excavated	material associated with the trenching activities is to
be restored pipeline is	, as far as practicable, to its original contours after the established.

**Recommendation 17:** The site-specific ESCP (or equivalent) should incorporate additional protective safeguards for watercourses/waterways mapped as riverine, lacustrine or DIWA wetlands (Queensland Wetland Map, **Appendix B**).

<sup>&</sup>lt;sup>6</sup> This riverine wetland is also mapped as the *Barratta Channels Aggregation - QLD196* DIWA wetland.



**Figure 5:** Wetlands of high ecological significance and wetland protection area trigger areas Project: Haughton Pipeline Stage 2 Project: Environmental Analysis Report

Proposed alignment (May 2021)
 We
 Major road
 Major drainage





Ν

T:\\_Temp Mapping 2021\135\WOR\135037\135037\_Wetland\_210827

#### Recommended print size: A3

# 4.4 Flora

# 4.4.1 Methods

A desk-based assessment and field survey were conducted to assess the flora values in the Project area.

The desk-based assessment included a review of information from the following sources.

- Vegetation management Regional Ecosystem (RE) mapping (DoR 2021b).
- Vegetation management regulated vegetation mapping (DoR 2021c).
- Regional Ecosystem description database (DES 2021a).
- Protected Plants Flora Survey Trigger Map (DES 2019c, Appendix D).
- MSES environmental reports (DES 2021b, Appendix E)
- Results from searches of the following databases.
  - EPBC Act Protected Matters Search Tool (DAWE 2021a). An EPBC Act Protected Matters Report was generated for an area within 20 km of a point central to the Project area (-19.82963 147.13252) (Appendix A).
  - Wildlife Online database (DES 2021c). A report was generated for an area within 30 km of a point central to the Project area (-19.8296, 147.1325) (Appendix F).
  - Atlas of Living Australia database (ALA 2021). Review of T&NT species records near the Project area.
- Queensland Globe aerial imagery (accessed via: <u>https://qldglobe.information.qld.gov.au/qldglobe/</u>).

The following field survey tasks were completed.

- Targeted search for T&NT<sup>7</sup> flora species and their habitats. The results of the desk-based assessment were used to identify potential species of interest.
- Targeted searches for weed (*ie* not-native flora) species with a focus on species that are listed under national, state, local or regional legislation, policy or guidelines.
- Field verification of Queensland Government RE mapping (DoR 2021b). Field verification of RE mapping in the Project area was undertaken by quaternary vegetation assessments (pursuant with Neldner *et al.* 2020). Thirty-two vegetation assessment sites were assessed across the Project area (**Figure 6**).
- A general flora species inventory was developed for all species encountered (**Appendix G**).

The field survey was undertaken on 21 April and 25–26 May 2021, at the end of the wet season. Flora species were generally visible and readily identifiable.

# 4.4.2 Description of environmental values

### Overview

The Project area is in the Townsville Plains subregion of the Brigalow Belt North bioregion (Sattler & Williams 1999) and broadly contains open eucalypt woodlands, narrow tracts of riparian forests along major watercourses and cleared land. Remnant vegetation cover in the subregion is 69.02% (Accad *et al.* 2021) due to broad-scale clearing for agriculture and

<sup>&</sup>lt;sup>7</sup> Threatened (Critically Endangered, Endangered, Vulnerable) or Near Threatened species as listed under the EPBC Act and NC Act.

mining, mostly affecting vegetation on fertile soils. The majority of relatively undisturbed habitats occur on rugged parts of the landscape (DES 2018).

During the field survey, 111 flora species, including 51 native species, were identified; a list of these species is in **Appendix G**.

#### Vegetation communities

### Regional ecosystems

REs are vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil (Sattler & Williams 1999). The REs mapped by the Queensland Government (DoR 2021b) as present in the Project area, and their regulatory status, are described in **Table 3**. The legislation and conservation status of each community is provided with reference to the following, and is current as at 30 June 2021.

- The EPBC Act, which lists Threatened Ecological Communities (TECs) as Vulnerable, Endangered or Critically Endangered. TECs are considered MNES and are protected under the EPBC Act.
- The VM Act, which categorises REs based on the remaining extent of the RE in the bioregion. REs are listed as Endangered, Of Concern or Least Concern.
- The Biodiversity Status (BD Status) of the REs according to the Queensland Department of Environment and Science. The BD Status is based on the extent of the REs in the bioregion, their condition, and the presence of threatening processes. REs are listed as Endangered, Of Concern or No Concern at Present.

According to the Queensland Government RE mapping (DoR 2021b), 11 different REs are mapped in the Project area<sup>8</sup>. These REs, are presented on **Figure 6** and in **Table 3**.

The mixed RE polygons mapped as RE11.3.4/11.3.25/11.3.13/11.3.25b on **Figure 6** (in the centre of the Project area) contain a dominant<sup>9</sup> Of Concern RE (11.3.4) under the VM Act. These polygons are also identified in the MSES mapping: regulated vegetation (category B – endangered or of concern) (**Appendix E**, DES 2021b).

The Queensland Government RE mapping (DoR 2021b) was verified at 32 assessment sites during the field survey (**Figure 6**) and is reliable for its intended use. Potential opportunities for refinement of the mapping were identified. The potential opportunities for refinement of the RE mapping are discussed below, and the results from the quaternary vegetation assessments are provided in **Appendix H**.

The following opportunities for refinement of the mapping do not alter the legislative status of the vegetation communities.

- Site 38: remnant RE 11.3.7 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.35. The tree layers were dominated by *Eucalyptus platyphylla* (Poplar Gum).
- Site 39: remnant RE 11.3.9 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.35. The tree layers were dominated by Poplar Gum with *Corymbia tessellaris* (Moreton Bay Ash) present.

<sup>&</sup>lt;sup>8</sup> Some of the RE polygons in the DoR (2021b) mapping contain more than one RE code (*ie* mixed polygons).

<sup>&</sup>lt;sup>9</sup> This RE accounts for 60% of the mixed polygons.

- Site 43: remnant RE 11.3.9 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.7. The tree layers were dominated by Moreton Bay Ash, with Poplar Gum present.
- Site 46: remnant RE 11.3.7/11.3.9 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.35. The tree layers were dominated by Poplar Gum with *Corymbia clarksoniana* (Clarkson's Bloodwood) and Moreton Bay Ash present.
- Site 51: remnant RE 11.3.9 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.7. The tree layers were dominated by *Corymbia dallachiana* (Dallachy's Gum) with Moreton Bay Ash present.
- Site 52: remnant RE 11.3.35/11.3.30 is mapped by DoR (2021b). NRA field verified this area as remnant RE 11.3.7. The tree layers were dominated by *Corymbia* spp. with Poplar Gum present.

The following opportunities for refinement of the mapping may alter the legislative status of the vegetation communities. More detailed vegetation surveys would be required to confirm this, and determine the extent of these areas.

- Site 16 and site 19: remnant RE 11.12.1 is mapped by DoR (2021b). NRA field verified these area as non-remnant vegetation. The tree 1 (T1) layers were low (8–12 m) with *Grevillea striata* (Beefwood), Poplar Gum and *Eremophila mitchellii* (False Sandalwood).
- Site 17: regrowth RE 11.12.1 is mapped by DoR (2021b). NRA field verified this area as non-remnant vegetation. The tree layers and shrub layers were absent. The ground layer was dominated by *Panicum* sp. and weed species.
- Two small areas (one north of the alignment, and one in the centre of the alignment) mapped as remnant vegetation by DoR (2021b) (RE 11.3.7/11.3.9 and RE 11.3.35/11.3.10 respectively). These areas were identified as non-remnant cropping land by a review of the aerial imagery.

### **Regulated vegetation**

Requirements for clearing vegetation in Queensland under the VM Act vary depending on the land tenure and regulated vegetation mapping (DoR 2021c). Regulated vegetation mapping comprises the following categories.

- **Category A**: *eg* declared areas, environmental offset areas and voluntary declaration areas.
- **Category B**: remnant vegetation areas.
- **Category C**: non-remnant areas of high-value regrowth vegetation.
- **Category R**: non-remnant areas of regrowth vegetation within 50 m of a watercourse or drainage feature in the GBR catchment areas.
- **Category X**: all other non-remnant vegetation areas.

The Project area contains Category B, Category R and Category X vegetation (**Figure 6**, DoR 2021c)<sup>10</sup>. The majority of the Project area is mapped as Category B vegetation, with smaller areas of Category X and Category R vegetation (see **Table 3**). Environmental approval requirements for the different categories of vegetation within the Project area are detailed in **Appendix K**.

<sup>&</sup>lt;sup>10</sup> Category C vegetation (mapped on **Figure 6**) occurs within 1 km of the proposed alignment but not in the Project area.

Areas mapped by DoR (2021c) as Category R vegetation are shown on **Figure 6**. These areas are identified in the MSES mapping: regulated vegetation (category R - GBR riverine) (**Appendix E**, DES 2021b).

#### **Threatened Ecological Communities**

TECs are communities that have been assessed and assigned a category related to the status of the threat to the community at a national scale. None of the vegetation communities mapped within the Project area are listed as TECs under the EPBC Act, and no TECs were observed during the field survey.

#### Table 3: REs mapped by the Queensland Government to occur in the Project area

RE Code <sup>1</sup>	Description <sup>2</sup>	Status <sup>3</sup>			Structure	Area (ha) and relative proportion of each RE in the Project area <sup>5</sup>		
		VM Act	BD Status	EPBC Act	Category <sup>4</sup>	Regrowth (Category R)	Remnant (Category B)	Non-remnant (Category X)
11.3.4	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. woodland on alluvial plains	OC	OC	-	Sparse	0.73 (0.13%)	14.03 (2.44%)	-
11.3.7	Corymbia spp. open woodland on alluvial plains	LC	OC	-	Very sparse	-	0.99 (0.17%)	-
11.3.9	<i>Eucalyptus platyphylla, Corymbia</i> spp. woodland on alluvial plains	LC	NC	-	Sparse	-	1.18 (0.21%)	-
11.3.10	Eucalyptus brownii woodland on alluvial plains	LC	NC	-	Sparse	-	7.76 (1.35%)	-
11.3.13	<i>Grevillea striata</i> open woodland on coastal alluvial plains	OC	E	-	Very sparse	0.20 (0.04%)	24.37 (4.24%)	-
11.3.25	<i>Eucalyptus tereticornis</i> or <i>E. camaldulensis</i> woodland fringing drainage lines	LC	OC	-	Sparse -	0.03 (0.01%)	50.46 (8.77%)	-
11.3.25b	Melaleuca leucadendra and/or M. fluviatilis, Nauclea orientalis open forest					0.31 (0.05%)	127.55 (22.17%)	-
11.3.30	<i>Eucalyptus crebra, Corymbia dallachiana</i> woodland on alluvial plains	LC	NC	-	Sparse	-	2.32 (0.40%)	-
11.3.35	Eucalyptus platyphylla, Corymbia clarksoniana woodland on alluvial plains		NC		Sparsa -	-	14.20 (2.47%)	-
11.3.35a	Corymbia tessellaris, C. clarksoniana and Eucalyptus platyphylla woodland	LC	nc	-	Sparse	0.96 (0.17%)	161.12 (28.01%)	-
11.12.1	Eucalyptus crebra woodland on igneous rocks	LC	NC	-	Sparse	0.18 (0.03%)	114.27 (19.87%)	-
Non-remnant	-	-	-	-	-	-	-	54.55 (9.48%)
Total	-	-	-	-	-	2.42 (0.42%)	518.26 (90.10%)	54.55 (9.48%)

<sup>1</sup> As per DoR (2021b) mapping.

<sup>2</sup> Description from the Regional Ecosystem Description Database (DES 2021a).

<sup>3</sup> VM Status: Least Concern (LC), Of Concern (OC) or Endangered (E). BD Status: No Concern at Present (NC), Of Concern (OC) or Endangered (E). EPBC Act status (TECs): Vulnerable (V), Endangered (E) or Critically Endangered (CE).

-: not listed.

<sup>4</sup> Structure categories from the Regional Ecosystem Description Database (DES 2021a).

<sup>5</sup> Calculated using a 100 m buffer either side of the proposed alignment (the 200 m wide design corridor) from DoR (2021b) RE mapping. Regulated vegetation categories: Category R, Category B and Category X. Data may be subject to rounding errors.



**Figure 6:** Vegetation assessment sites and Regional Ecosystems mapped by the Queensland Government Project: Haughton Pipeline Stage 2 Project: Environmental Analysis Report



Recommended print size: A3

#### **Threatened and Near Threatened flora species**

The Project area did not contain any 'high risk' areas on the *Protected Plants Flora Survey Trigger Map* (DES 2019c, **Appendix D**); therefore, the field survey did not need to comply with requirements of the *Flora Survey Guidelines* (DES 2020b).

Database searches identified six T&NT species that may occur in the Project area, or for which suitable habitat exists (DAWE 2021a, DES 2021c, ALA 2021). Information on these species and their likelihood of occurrence are provided in **Appendix I**.

No T&NT flora species were recorded during the field survey. One species has a 'possible' likelihood of occurrence: Black Ironbox (*Eucalyptus raveretiana*). This species is considered an MNES (*ie* listed threatened species) and is protected under the EPBC Act. A description of this species, and the suitability of habitats in the Project area to support it, is provided below. No other T&NT flora, or potential habitat for T&NT flora, were identified in the Project area during the field survey.

#### Black Ironbox

Black Ironbox (Vulnerable, EPBC Act; Least Concern, NC Act) is a large tree that occurs in riparian woodlands on alluvial flats along river banks on sandy and/or alluvial soils (DEWHA 2008). The species occurs in the region. The nearest record of the species is approximately 4 km north-west of the Project area along the Haughton River (NRA 2018). The next closest record is approximately 9 km south of the Project area along the Burdekin River (ALA 2021)<sup>11</sup>. During the field survey, no Black Ironbox trees were found in the Project area; however, suitable habitat was identified along the Burdekin River including areas within the Project area. It is recommended that pre-clearing surveys in areas of potentially suitable habitat occur to assess the presence of Black Ironbox in the Project area.

#### Weed species

The desk-based assessment identified 81 weed species (*ie* species introduced to Queensland) as possibly occurring within the Project area. These species include the following weeds of management concern, which are considered to threaten socioeconomic and environmental values.

- Weeds of National Significance (WoNS).
- 'Prohibited Matter' or 'Restricted Matter' under the Queensland *Biosecurity Act* 2014 (Biosecurity Act).
- High priority species listed under local government biosecurity plans and regional pest management plans (BSC undated, NQ Dry Tropics 2014).

Sixty weed species were recorded during the field survey (**Appendix G**). Seventeen weeds of management concern were recorded (**Table 4**). Weeds of management concern, and their abundance at each vegetation assessment site, are presented in **Appendix J**.

Many weed species were abundant in the Project area. It is expected that the abundance and location of weed species may change between the time that the field survey was undertaken and the commencement of Project construction. It is recommended that a detailed weed survey be undertaken immediately prior to construction to confirm weed locations and the subsequent management for weed control. Ideally, the weed survey should be undertaken at a time when

<sup>&</sup>lt;sup>11</sup> Records for this species near the Project area are not recent (*circa* 1950).

weeds are most likely to be present or have features required for identifying species *ie* soon after the wet season.

#### Nationally significant weeds

At the national level, the Commonwealth Government maintains a list of WoNS; this list currently comprises 32 species (Weeds Australia 2021). These species are listed based on their invasiveness, potential for spread, and environmental, social and economic impacts. Six WoNS were recorded during the field survey (**Table 4**).

#### State significant weeds

In Queensland, the Biosecurity Act provides the framework and powers for the management of biosecurity matters, including weed species. Landholders are required to comply with the general biosecurity obligation (GBO), which is defined under the Biosecurity Act as follows.

- Take all reasonable and practical steps to prevent or minimise each biosecurity risk.
- Minimise the likelihood of the risk causing a biosecurity event and limit the consequences of such an event.
- Prevent or minimise the adverse effects the risk could have and refrain from doing anything that might exacerbate the adverse effects.

The Biosecurity Act lists species as Prohibited Matter or Restricted Matter. Prohibited Matter is biosecurity matter that is not found in Queensland, but would have a significant adverse impact on our health, way of life, the economy or the environment if it entered the state. Restricted Matter is biosecurity matter found in Queensland and has a significant impact on human health, social amenity, the economy or the environment. There are seven categories of Restricted Matter, and a species may fall under more than one category.

Eleven Category  $3^{12}$  Restricted Matter species were observed during the field survey (**Table 4**).

#### Locally and regionally significant weeds

Local and regional pest management documents provide a resource for determining the significance of weed species at local scales. The documents relevant to the Project area are the *Regional Pest Management Strategy for the Burdekin Dry Tropics NRM Region 2014 – 2019* (RPMS BDT) (NQDT 2014) and the *Burdekin Shire Council Biosecurity Plan Draft v 2.0 2020-2025* (BSC Biosecurity Plan) (BSC undated).

- **RPMS BDT**. Of the weed species found during the field survey, 15 weed species are listed as 'Priority species' (**Table 4**).
- **BSC Biosecurity Plan**. Of the weed species found during the field survey, 10 weed species are listed as 'Very High' risk weeds (**Table 4**).

<sup>&</sup>lt;sup>12</sup> A person who has Category 3 Restricted Matter in the person's possession or under the person's control must not distribute or dispose of the Restricted Matter unless the distribution or disposal meets the requirements of the Biosecurity Act.
Spacios	Common name ——		Status			
Species		WoNS <sup>1</sup>	Biosecurity Act <sup>2</sup>	RPMS BDT <sup>3</sup>	BSC Biosecurity Plan <sup>4</sup>	
Argyreia nervosa	Woodrose	-	Category 3	-	-	
Cryptostegia grandiflora	Rubber Vine	Х	Category 3	Priority	Very High	
Grewia asiatica	Grewia	-	=	Priority	-	
Hymenachne amplexicaulis	Hymenachne	Х	Category 3	Priority	Very High	
Jatropha gossypiifolia	Bellyache Bush	Х	Category 3	Priority	Very High	
Lantana camara	Lantana	Х	Category 3	Priority	Very High	
Leucaena leucocephala	Leucaena	-	=	Priority	Very High	
Opuntia stricta	Prickly Pear	Х	Category 3	Priority	-	
Parkinsonia aculeata	Parkinsonia	Х	Category 3	Priority	Very High	
Senna obtusifolia	Sicklepod	-	Category 3	Priority	Very High	
Sporobolus jacquemontii	American Rat's Tail Grass	-	Category 3	Priority	-	
Sporobolus natalensis/pyramidalis	Giant Rat's Tail Grass	-	Category 3	Priority	Very High	
Stachytarpheta jamaicensis	Jamaica Snakeweed	-	=	Priority	-	
Themeda quadrivalvis	Grader Grass	-	=	-	Very High	
Vachellia farnesiana	Mimosa Bush	-	=	Priority	-	
Xanthium occidentale	Noogoora Burr	-	-	Priority	-	
Ziziphus mauritiana	Chinee Apple	-	Category 3	Priority	Very High	

#### Table 4: Weeds of management concern observed in the Project area during the field survey and their status

<sup>1</sup>WoNS = Weeds of National Significance; 'X' indicates species listed as WoNS.

<sup>2</sup>Biosecurity Act = Queensland *Biosecurity Act* 2014 (Restricted Matter categories comprise: Category 1, Category 2, Category 3, Category 4, Category 5, Category 6 and Category 7).

<sup>3</sup> RPMS BDT = *Regional Pest Management Strategy 2014 - 2019 for the Burdekin Dry Tropics* (NQDT 2014) (categories comprise: Priority and Alert).

<sup>4</sup>BSC Biosecurity Plan = Burdekin Shire Council Biosecurity Plan Draft v 2.0 2020-2025 (BSC undated) (categories comprise: Very High, High and Medium risk).

#### 4.4.3 Potential impact and mitigation measures

Construction activities (as described in **Section 2.2**) associated with the Project pose the following direct and indirect threats to flora values.

- **Direct threats** are vegetation clearing and the loss of habitat for flora species. Direct threats include the following.
  - Clearing of T&NT flora species during construction. The Project area incorporates
    potential habitat for the T&NT flora species Black Ironbox. Although this species
    was not found in the Project area during the field survey, additional surveys are
    recommended to assess its presence in the Project area.
  - Clearing of regulated vegetation during construction works. Category B and Category R regulated vegetation is present in the Project area. Remnant REs in the Project area are classified as Least Concern and Of Concern under the VM Act.
- **Indirect threats** are secondary threats that may occur as a result of the Project. Their impacts may extend beyond the development footprint and may include the following.
  - Habitat alteration and degradation as a result of weed ingress and ground disturbance. The Project area contains several weed species, including species of management concern. The risk of spreading these weed species across the Project area is high given:
    - weed species are present (and, in some areas, abundant) throughout the Project area
    - $\circ$  weeds and weed seeds may be spread easily by the movement of vehicles
    - weed species are quick to establish.
  - Fugitive dust smothering vegetation, reducing plant health in the immediate receiving environment.

At this stage of the Project, detailed designs (*ie* a final clearing area) are not available, so it is not possible to quantify the potential magnitude of impact that may result from the threats. Potential direct threats on flora values are predominantly associated with planned vegetation clearing. Some indirect threats may be short-term and localised (*eg* fugitive dust), whereas others, if not properly managed, may cause severe and/or irreversible impacts at the site, local and regional scales (*eg* biosecurity incursions).

Measures to manage the potential impacts on flora values are provided below (where applicable these should be included in the Project CEMP). These recommendations are in addition to those already provided.

Recommendation 18:	Vegetation clearing will be limited to the width of construction corridor. In defining the location of the construction corridor, the following should occur:			
	• minimise the area of Category B and Category R vegetation to be cleared for the Project, especially across major watercourses and near large mature trees (if practicable)			
	• minimise the areas of Of Concern (VM Act status) REs to be cleared for the Project (especially across watercourses)			
Recommendation 19:	Access roads, parking, laydown, stockpiling areas and camps (if needed) should occur (where possible) in previously cleared areas to avoid the need to clear additional remnant vegetation in the Project area.			
Recommendation 20:	A flora survey to confirm presence of T&NT flora species Black Ironbox in areas of potentially suitable habitat ( <i>ie</i> riparian			

vegetation along Burdekin River) should be commissioned by the construction contractor as part of pre-construction activities (*ie* the pre-clearance survey).

- **Recommendation 21:** Obtain an operational works permit for clearing native vegetation (VM Act) for applicable areas.
- **Recommendation 22:** A formal weed survey should be commissioned by the construction contractor as part of pre-construction activities to confirm weed presence along the pipeline alignment and ancillary areas. The survey should occur soon after the wet season and immediately prior to construction.
- **Recommendation 23:** A Project Weed and Pest Management Plan (or equivalent) should be developed and implemented. The Plan must include management direction taken from the Biosecurity Act and regional biosecurity plans and pest management plans (NQDT 2014, BSC undated).
- **Recommendation 24:** Where clearing activities involve disturbing topsoil from known weed infestation areas, this soil material should be quarantined and not used in rehabilitation. The soil contaminated with weed seeds can be buried to a depth of at least 1 m below ground surface.
- **Recommendation 25:** Conserve and stockpile topsoil and seed-bearing vegetation for use in rehabilitation.

### 4.5 Fauna

#### 4.5.1 Methods

A desk-based assessment and field studies were conducted to assess the fauna values applicable to the Project area. The desk-based assessment included a review of information from the following sources.

- Queensland Government Broad Vegetation Group (BVG) mapping (1:2 M) (DES 2021d).
- Vegetation management essential habitat mapping (DoR 2021d).
- Results from searches of the following databases.
  - EPBC Act Protected Matters Search Tool (DAWE 2021a). An EPBC Act Protected Matters Report was generated for an area within 20 km of a point central to the Project area (-19.82963 147.13252) (Appendix A).
  - Wildlife Online database (DES 2021c). A report was generated for an area within 30 km of a point central to the Project area (-19.8296 147.1325) (Appendix F).
  - Atlas of Living Australia database (ALA 2021). Review of T&NT species records near the Project area.

The following field survey tasks were completed.

• Searches for, and assessment of, potential habitat for T&NT, Migratory and Special Least Concern fauna species.

- Deployment and collection of full-spectrum acoustic bat detectors to assess the presence of T&NT micro-bat species, including Bare-rumped Sheath-tailed Bat (*Saccolaimus saccolaimus nudicluniatus*)<sup>13</sup>.
- Ascertaining the presence of important fauna breeding and roosting places.
- Compiled a general fauna species inventory for all species encountered.

The field survey was undertaken on 21 April and 25–26 May 2021, at the end of the wet season. Three acoustic bat detectors (**Figure 8**) were deployed on 25 (one detector) and 26 (two detectors) May 2021, and were collected on 4 June 2021. Conditions during the survey were suitable for detecting fauna.

#### 4.5.2 Description of environmental values

#### Overview

Sixty-six fauna species were identified during the field survey (Appendix G).

#### Fauna habitats

#### Broad vegetation groups

The following BVGs (1:2M) are mapped by the Queensland Government (DES 2021d) to occur in the Project area. Descriptions are as per Neldner *et al.* (2019).

- *BVG 9: Moist to dry eucalypt open forests to woodlands usually on coastal lowlands and ranges.* 
  - Widespread in the Project area, occurs throughout most of the low-lying areas.
- *BVG 13: Dry to moist eucalypt woodlands and open forests, mainly on undulating to hilly terrain of mainly metamorphic and acid igneous rocks.* 
  - Localised, occurs in the centre of the Project area on lower hill slopes.
- *BVG 16: Eucalyptus spp. dominated open forest and woodlands drainage lines and alluvial plains.* 
  - Occurs in the centre of the Project area on floodplains near drainage lines, and in the south of the Project area in the Burdekin River channel.
- *BVG 18: Dry eucalypt woodlands to open woodlands primarily on sandplains or depositional plains.* 
  - Localised, occurs in the south of the Project area, adjacent to riparian vegetation fringing the Burdekin River.
- BVG 22: Melaleuca spp. on seasonally inundated open forests and woodlands of lowland coastal swamps and fringing drainage lines (palustrine wetlands).
  - Occurs along drainage channels throughout the centre and north of the Project area.

#### Habitat features

Notable habitat features in the Project area include:

- variable light conditions, including areas of full sun, dappled shade and deep shade
- dense ground cover comprising living plants, leaf litter and coarse woody debris (including fallen trees)
- complex vegetation structure including dense canopy and shrub layers in riparian areas
- an abundance of hollow-bearing trees

<sup>&</sup>lt;sup>13</sup> The survey achieved the minimum survey effort recommended in the Australian Government survey guidelines for threatened bats (*ie* 16 detector nights) (DEWHA 2010).

- ephemeral and permanent sources of surface water (watercourses and wetlands)
- a diversity and abundance of flowering plants
- a variety of land surface conditions and soil types
- presence of mistletoes.

#### Condition

The condition of fauna habitats in the Project area was varied. The influence of cattle grazing and fire was evident; in some areas these actions have had negative impacts on habitats. Some degree of weed ingress was present throughout the Project area. Weeds were dominant in the ground layers and shrub layers at most sites assessed. Tree layers were dominated by native species.

#### Essential habitat

Essential habitat for the following species is mapped by the Queensland Government (DoR 2021d) in or near the Project area and shown on **Figure 7**. Essential habitat is an MSES (**Appendix E**).

- Estuarine Crocodile (*Crocodylus porosus*): areas within the Project area (in the centre), and upstream of Project area (along Burdekin River).
- Koala (Phascolarctos cinereus): an area-south west of the Project area.
- Bare-rumped Sheathtail Bat: areas the north-west of the Project area.

The likelihood of occurrence assessment for these species is provided in **Appendix I**. Essential habitat mapping is created using sighting records held by the Queensland Government and does not accurately portray the extent of potentially suitable habitat for these species.

Estuarine Crocodile and Bare-rumped Sheathtail Bat are discussed in more detail below. Koala is not considered likely to occur in or near the Project area. The essential habitat mapping is based on a single, old (1987) sighting, and no recent records of Koala are present in the vicinity of the Project area (ALA 2021). Koala is present on Magnetic Island, though no permanent populations are known to occur in the Townsville mainland.

#### Important breeding and roosting places

Hollows occur in the mature Eucalypt/Corymbia species, in the larger *Melaleuca* spp. (*eg M. leucadendra* and *M. fluviatilis*) and in dead trees in the Project area. The hollows vary in size and structure according to:

- the age and size of the tree
- the tree species
- historical influences such as fires, storms and insect activity.

Some of these hollows may provide a breeding or roosting place for a variety of fauna, including T&NT species such as the Bare-rumped Sheathtail Bat and Southern Black-throated Finch (*Poephila cincta cincta*).

No large or significant bird nests or other obvious breeding places were observed during the field survey.

#### Threatened and Near Threatened fauna species

Database searches identified 21 T&NT fauna species that may occur in the Project area, or for which suitable habitat exists (DAWE 2021a, DES 2021c, ALA 2021). Information on these species and their likelihood of occurrence are provided in **Appendix I**.

One T&NT fauna species was possibly recorded during the field survey, but it could not be confirmed (this species has a probable likelihood of occurrence):

• Bare-rumped Sheathtail Bat: Vulnerable, EPBC Act; Endangered, NC Act.

No other T&NT fauna species were recorded during the field survey; however, the following species have the potential to occur. Further survey work over different seasons and employing different survey techniques would be required to confirm the presence/absence and distribution of these species in the Project area.

- Probable likelihood of occurrence: three species.
  - Southern Black-throated Finch: Endangered, EPBC Act and NC Act.
  - Squatter Pigeon (southern subspecies) (*Geophaps scripta scripta*): Vulnerable, EPBC Act and NC Act.
  - White-throated Needletail (*Hirundapus caudacutus*): Vulnerable and Migratory, EPBC Act; Vulnerable, NC Act.
- Possible likelihood of occurrence: one species.
  - Estuarine Crocodile: Migratory, EPBC Act; Vulnerable, NC Act.

A description of each species, and the suitability of habitats in the Project area to support the species, is provided below. These species are considered MNES (*ie* listed threatened or migratory species) and are protected under the EPBC Act.

#### Bare-rumped Sheathtail Bat

The Bare-rumped Sheathtail Bat is a poorly known species. In north-east Queensland it is primarily found in near-coastal areas. It is insectivorous and preferentially forages above the tree canopy in eucalypt forests and woodlands (Woinarski *et al.* 2014). However, it has been recorded foraging above a variety of habitat types, along forest edges and large clearings, and over modified habitats including agricultural areas (Churchill 2008, Lumsden 2017). Barerumped Sheathtail Bats have been recorded roosting during the day in tree hollows, with large diameter, deep chambered, hollows being preferred (Compton & Johnson 1983, Murphy 2002, Churchill 2008, Milne & Pavey 2011, Reside *et al.* 2015). Only a few roost sites have been documented for this species in Australia, with the species recorded roosting in Poplar Gum, Darwin Stringybark (*Eucalyptus tetrodonta*), Weeping Tea-tree (*Melaleuca leucadendra*) and Moreton Bay Ash. Roosts may be used regularly, but individuals may use multiple roosts, and numbers at a roost site may vary temporally (Woinarski *et al.* 2014).

The Bare-rumped Sheathtail Bat is likely to occur above all habitats in the Project area, and some hollow-bearing trees may contain roosting bats or suitable roosting habitat. Areas likely to contain suitable roosting habitat within and outside of the Project area are shown on **Figure 8**. Several sheathtail bat (*Saccolaimus* sp.) calls were recorded at acoustic bat detectors in the south and centre of the Project area (**Figure 8**). These calls could represent either the Bare-rumped Sheathtail Bat or the Yellow-bellied Sheathtail Bat (*Saccolaimus flaviventris*)<sup>14</sup> (**Graph 2**). The locations where calls were recorded contain suitable foraging and roosting habitat for the species.

<sup>&</sup>lt;sup>14</sup> Least Concern conservation status under the NC Act.



Graph 2: Sonagram showing detection of *Saccolaimus* sp. from an Anabat audio recording in the south of the Project area

#### Southern Black-throated Finch

Southern Black-throated Finch is restricted to Queensland, with subpopulations in the central and northern Desert Uplands, southern Einasleigh Uplands, southern Wet Tropics and northern Brigalow Belt bioregions (Buosi *et al.* in press). Townsville supports one of the largest subpopulations of Southern Black-throated Finch. This species inhabits open woodlands, woodlands and open forests (usually dominated by *Eucalyptus* sp. or *Melaleuca* sp.) where there is access to seeding grasses and water (Mula-Laguna *et al.* 2019, Buosi *et al.* in press). They appear to feed preferentially on fallen seeds of grasses, sedges and legumes, including both native and introduced species, in grassy areas where the ground layer is not dense (Zann 1976, Mitchell 1996, NRA 2005, 2007, 2011, Rechetelo *et al.* 2016, Mula-Laguna *et al.* 2019, Buosi *et al.* in press). Southern Black-throated Finches nest in the branches and small hollows of trees and shrubs, favouring Poplar Gum and Broad-leaf Tea-tree (*Melaleuca viridiflora*) in the Townsville region.

Populations of this species are known to occur near the Project area. An area along the Haughton River (directly adjacent to the north of the Project area) is mapped as an 'important area' for this species in DEWHA (2009). Some areas of remnant vegetation within the Project area were consistent with habitats that Southern Black-throated Finches are known to occur in. Other areas within the Project area were in poor condition, with frequent signs of heavy grazing and/or a high abundance of weeds that form a dense ground cover and are unfavourable to Southern Black-throated Finches (*eg* Shrubby Stylo (*Stylosanthes scabra*) and Joyweed (*Alternanthera ficoidea*). Areas likely to contain suitable habitat within and outside of the Project area are shown on **Figure 9**<sup>15</sup>.

#### Squatter Pigeon

In north Queensland, Squatter Pigeon (southern subspecies) is known to occur south of the Burdekin-Lynd divide (in the southern region of the Cape York Peninsula), and from the east coast to Hughenden. Nesting and primary food resources for Squatter Pigeon generally occur in open-forest to woodland communities with patchy (*ie* approximately 33% ground cover) tussock-grassy understories growing on well-draining gravelly, sandy or loamy soils within 1 km of a permanent waterbody (Squatter Pigeon Workshop 2011). The majority of the Project area, including areas mapped as non-remnant vegetation, constitutes potentially suitable foraging and nesting habitat. Resident and transient populations of Squatter Pigeon (small flocks) may occur in and near to the Project area—in woodlands, open woodlands and non-remnant vegetation, and favouring the more sparsely grassed areas (due to natural conditions or disturbance) near water.

<sup>&</sup>lt;sup>15</sup> Suitable habitat was categorised using RE mapping (DoR 2021b) and refined based on aerial imagery and the results of the field survey. Additional survey work would be required to further refine this mapping.

#### White-throated Needletail

The White-throated Needletail breeds in north-eastern Asia, migrating when non-breeding to spend the spring and summer months in Australia (Menkhorst *et al.* 2019). The species spends most its time in flight, foraging on insects above a variety of habitat types. In the region, flocks often pass before a storm at the start of the wet season but are otherwise scarce. The species feeds above any habitat, and no areas of core habitat are identifiable in the Project area. The Project area is unlikely to support breeding populations or habitat. Its presence is likely to be sporadic and temporary.

#### Estuarine Crocodile

Estuarine Crocodile occurs in salt, brackish and fresh water bodies across northern and eastern Queensland. Its primary food sources are crustaceans, insects and mammals (DAWE 2021d). Populations extend inland along major waterways. Individuals may, on rare occasions, range along the Burdekin River in the vicinity of the Project area.

#### Migratory and Special Least Concern fauna species

Database searches identified 22 Migratory and/or Special Least Concern fauna species that may occur in the Project area, or for which suitable habitat exists (DAWE 2021a, DES 2021c, ALA 2021). Information on these species and their likelihood of occurrence are in **Appendix I**.

No Migratory or Special Least Concern fauna species were recorded during the field survey; however, the following species have the potential to occur. Further survey work over different seasons and employing different survey techniques would be required to confirm the presence/absence and distribution of these species in the Project area.

- Probable likelihood of occurrence: two species.
  - Fork-tailed Swift (*Apus pacificus*): Migratory, EPBC Act; Special Least Concern, NC Act.
  - White-throated Needletail (discussed above).
- Possible likelihood of occurrence: seven species.
  - Eastern Osprey (*Pandion cristatus (Pandion haliaetus)*): Migratory, EPBC Act; Special Least Concern, NC Act.
  - Black-faced Monarch (*Monarcha melanopsis*): Migratory, EPBC Act; Special Least Concern, NC Act.
  - Spectacled Monarch (Symposiachrus trivirgatus trivirgatus): Migratory, EPBC Act;
     Special Least Concern, NC Act.
  - Rufous Fantail (*Rhipidura rufifrons*): Migratory, EPBC Act; Special Least Concern, NC Act.
  - Oriental Cuckoo (*Cuculus optatus*): Migratory, EPBC Act; Special Least Concern, NC Act.
  - Short-beaked Echidna (*Tachyglossus aculeatus*): Special Least Concern, NC Act.
  - Estuarine Crocodile (discussed above).

A description of each species, and the suitability of habitats in the Project area to support the species, is provided below. These species (other than Short-beaked Echidna) are considered MNES (*ie* listed threatened or migratory species) and are protected under the EPBC Act.

#### Fork-tailed Swift

Fork-tailed Swift is a non-breeding visitor to Australia (Higgins 1999). Flocks may pass through the region at any time during the wet season. The species feeds above any habitat, and

no areas of core habitat are identifiable in the Project area. Its presence is likely to be sporadic and temporary.

#### Eastern Osprey

Easter Osprey is common in coastal areas of north Queensland. It favours littoral habitats, river mouths and terrestrial wetlands, occasionally occurring farther inland along major rivers. It may range along the Burdekin River in/near to the Project area.

#### Black-faced Monarch

Black-faced Monarch is a passage migrant (March/April and September/October) through lowlands of the region (mainly in rainforest ecosystems). It is likely to be an infrequent visitor to the Project area, favouring riparian forests and nearby woodland habitat.

#### Spectacled Monarch

Spectacled Monarch is generally a winter migrant to the region, preferring dense vegetation types (*eg* vine forests and dense woodland) (Wieneke 1989). It is likely to be an infrequent visitor to the Project area, favouring larger riparian forests and nearby woodland habitat.

#### **Rufous Fantail**

Rufous fantail is a summer migrant to the region, often occurring in tropical rainforests. It can also be found in vine thickets (especially along creeks). Within the Project area, preferred habitat occurs along the larger riparian forests and nearby woodlands.

#### **Oriental Cuckoo**

Oriental Cuckoo is primarily a summer migrant, occurring in dense vegetation such as rainforest margins, vine thickets and mangroves. It is likely to be an infrequent visitor to the Project area, favouring riparian forests and nearby woodland habitat.

#### Short-beaked Echidna

This species is Australia's most widespread native mammal, occurring in almost all habitats, *eg* various open woodland types, savannah, semi-arid and arid areas, and rainforest. Shortbeaked Echidnas shelter and/or forage among rocks, hollow logs, within shrubs and tussocks of grass, and burrow into the soil (Nicol & Anderson 2007, Aplin *et al.* 2016). All areas of remnant vegetation in the Project area are suitable for this species.

#### Pest fauna

The desk-based assessment identified 22 pest fauna species (*ie* species introduced to Queensland) as possibly occurring within the Project area. These include the following species considered to threaten socioeconomic and environmental values.

- 'Prohibited Matter' or 'Restricted Matter' under the Biosecurity Act.
- High priority species listed under local government biosecurity plans and regional pest management plans (BSC undated, NQDT 2014).

Two pest fauna species were recorded during the field survey.

- Feral Pig (Sus scrofa).
  - Evidence of pig activity was widely observed in wetland/riparian areas, which provide ideal habitat for this species.
- European Rabbit (*Oryctolagus cuniculus*).
  - Signs were observed in the centre of the Project area in open woodland habitat.

Feral Pig and European Rabbit are Categories 3, 4, 5 and 6 Restricted Matter under the Biosecurity Act<sup>16</sup>, and priority species in the RPMS BDT (NQDT 2014). Additionally, Feral Pigs are Very High risk species in the BSC Biosecurity Plan (BSC undated).

<sup>&</sup>lt;sup>16</sup> These categories are defined as follows.

<sup>•</sup> Category 3: A person who has Category 3 Restricted Matter in the person's possession or under the person's control must not distribute or dispose of the Restricted Matter unless the distribution or disposal meets the requirements of the Act.

<sup>•</sup> Category 4: A person must not move, or cause or allow to be moved, Category 4 Restricted Matter, unless the moving is for the purposes of its identification by, or at the request of, a relevant entity as defined by the Act.

<sup>•</sup> Category 5: A person must not keep in the person's possession or under the person's control Category 5 Restricted Matter, unless the keeping is for the purposes of its identification by, or at the request of, a relevant entity as defined by the Act.

<sup>•</sup> Category 6: A person must not give food to a Category 6 Restricted Matter unless the feeding is carried out in preparation for, or in the course of, lawfully baiting, trapping or shooting the Category 6 Restricted Matter.





Recommended print size: A4



#### 4.5.3 Potential impact and mitigation measures

Construction activities (as described in **Section 2.2**) associated with the Project pose the following direct and indirect threats to fauna and associated habitat.

- **Direct threats** are the loss of habitat (and subsequent displacement of wildlife), and direct mortality during clearing and excavation works. With respect to habitat loss, it is the loss of core, limiting, or critical habitat that poses the greatest direct threat.
- **Indirect threats** are secondary threats that may occur as a result of the Project. Their impacts may extend beyond the development footprint and may include the following.
  - Habitat alteration and degradation as a result of weed ingress and ground disturbance.
  - Introduction of pest fauna (or pathogens) that prey on, exclude or compete with native fauna.
  - Increased levels of habitat fragmentation, *ie* changed fauna behaviours in response to human presence and/or habitat loss.
  - Sedimentation and contamination of waterways resulting in reduced water quality and/or reduced dry season water levels.

The fauna species (and populations) that are most vulnerable to the direct and indirect threats (and resulting impacts) are those that:

- are permanent, frequent or regular inhabitants of the site
- are sensitive to the threats posed by the action<sup>17</sup>
- have core, limiting or critical habitat within the receiving environment of impact.

At this stage in the Project, detailed designs (*ie* a final clearing area) are not available, so it is not possible to quantify the potential magnitude of impact that may result from the threats. Potential direct threats on fauna values are predominantly associated with planned vegetation clearing and habitat loss. Some indirect threats may be short-term and localised (*eg* disturbance), whereas others, if not properly managed, may cause severe and/or irreversible impacts at the site, local and regional scales (*eg* biosecurity incursions).

With respect to the T&NT, Migratory and Special Least Concern fauna described in **Section 4.5.2**, the following species are unlikely to be significantly impacted by the proposed works as no areas of core habitat are identifiable in the Project area, and they are likely to have a sporadic and temporary presence.

- White-throated Needletail.
- Estuarine Crocodile.
- Fork-tailed Swift.
- Eastern Osprey.
- Oriental Cuckoo.

The species most likely to be impacted by the proposed works, and the nature of those impacts, are discussed below.

#### Bare-rumped Sheathtail Bat

Within the Project area, Bare-rumped Sheathtail Bat is likely to forage above all habitats (including disturbed areas). It may roost in any tall hollow-bearing trees, with large diameter,

<sup>&</sup>lt;sup>17</sup> Due to biology (including life history), behaviour and/or population size.

deep chambered, hollows preferred. Habitats where Melaleucas (syn. Paperbarks/Tea-trees) and Eucalypts (*Eucalyptus* and *Corymbia* spp.) are dominant components of the vegetation community are considered potential roosting habitat for this species, and are shown on **Figure 8**.

Habitat loss and degradation are the main project-related threats to this species. Habitat loss can be reduced by maximising the use of existing disturbed areas and by minimising clearing extents in areas where mature vegetation occurs (especially near large mature trees). If this is achieved, the resulting impacts are unlikely to be significant, as habitats of similar type and quality are common in the immediate and local landscape.

It is difficult to establish the presence of roosting bats. To reduce the potential for inadvertent impacts on roosting individuals, large hollow-bearing trees should be retained where possible. Where clearing of these trees is necessary, a spotter-catcher should be present during clearing to provide guidance if a roost is disturbed or an injured bat is found. The introduction or proliferation of weeds, especially those that increase the risk and intensity of fires (*eg* Grader Grass), poses a threat to the suitability and condition of potential habitats for the Bare-rumped Sheathtail Bat. This risk can be managed via a Project Weed and Pest Management Plan (or equivalent).

In the absence of mitigation, only a small proportion of core/roosting habitat for this species is likely to be negatively impacted. This scale of impact is negligible, as habitats of similar type and quality are abundant in the immediate and local landscape. To ensure project-related threats are controlled and minimised, the implementation of the above mitigation measures is recommended. If this occurs, significant impacts on the Bare-rumped Sheathtail Bat are not anticipated.

#### Southern Black-throated Finch

Some areas of remnant vegetation within the Project area were consistent with habitats that Southern Black-throated Finches are known to occur in. Potential roosting and/or foraging habitat for this species is shown on **Figure 9**. An area along the Haughton River (near the north of the Project area) is mapped as an 'important area' for this species in DEWHA (2009). Targeted surveys of the Project area for Southern Black-throated Finches may be required to meet regulatory (*ie* policy) requirements<sup>18</sup>.

The proposed works may result in the loss of potential foraging and nesting habitat for Southern Black-throated Finch. The long-term loss of foraging habitat is likely to be negligible if disturbance footprints are minimised and disturbed areas are properly rehabilitated (with suitable grass species) post-construction.

The clearing of potential nesting trees (*eg* Poplar Gum and Broad-leaf Tea-tree) in areas of suitable habitat (particularly higher suitability habitat) (**Figure 9**) has the potential to result in the loss of nesting resources. This impact can be reduced by maximising the use of existing disturbed areas and by minimising clearing extents in areas where mature vegetation occurs. If this is achieved, the resulting impacts are unlikely to be significant as habitats of similar type and quality are abundant in the immediate and local landscape.

In areas of suitable habitat (particularly higher suitability habitat), where potential nesting trees are present (**Figure 9**), vegetation clearing has the potential to kill or injure nesting Southern Black-throated Finches. The direct threat to nesting birds can be avoided by undertaking pre-

<sup>&</sup>lt;sup>18</sup> This should be confirmed in consultation with the regulator.

clearance surveys and, if nesting birds are found, ceasing work around the nest until the occupants vacate the area<sup>19</sup>. The risk of impacting breeding birds can be further reduced by timing clearing activities to avoid the core breeding season (seasonally dependent though nominally February to June).

Southern Black-throated Finches are reliant on seasonal and permanent water sources, including natural and man-made features. Erosion and sedimentation during construction of the pipeline has the potential to reduce the availability of surface water. This risk can be minimised by implementing a site-specific ESCP prepared by a suitably qualified practitioner.

The proposed works have the potential to introduce or proliferate non-native plant species, including species that are detrimental to habitats preferred by Southern Black-throated Finches. Bulky exotic grasses such as Grader Grass are significant threats to the conservation of the Southern Black-throated Finches (Mula-Laguna *et al.* 2019, Buosi *et al.* in press). The introduction of invasive ants (*ie* Tramp Ants), which prey on nesting birds, is also a threat. These threats can be minimised and controlled via a Project Weed and Pest Management Plan (or equivalent).

In summary, the proposed works have the potential to impact on foraging habitat, nesting habitat and water sources that may be used by Southern Black-throated Finches. The project-related threats can be avoided or minimised by implementing the recommendations provided above. If this occurs, significant impacts on the Southern Black-throated Finch are not anticipated.

#### Squatter Pigeon

The majority of the Project area, including many areas mapped as non-remnant vegetation, constitutes potentially suitable foraging and nesting habitat for Squatter Pigeon. Potential impacts on Squatter Pigeon habitat will be short-term, and negligible, if disturbance footprints are minimised, disturbed areas are rehabilitated, and the risk of weed and pest species<sup>20</sup> introduction and spread is managed via a Project Weed and Pest Management Plan (or equivalent). Direct threats to nesting Squatter Pigeons can be avoided by conducting preclearance surveys prior to vegetation clearing and, if nesting birds are found, ceasing work around the nest until the occupants vacate the area<sup>21</sup>. Further, impacts on water sources can be minimised by implementing a site-specific ESCP prepared by a suitably qualified practitioner.

Squatter Pigeons may benefit (even in the absence of mitigation) from the long-term modification to habitats that result from the proposed construction of the Project. However, the loss or degradation of habitat due to erosion and sedimentation, weed ingress and pest species introduction/spread should be managed as per the recommendations described above. If this occurs, significant impacts on Squatter Pigeons are not anticipated.

#### Black-faced Monarch, Spectacled Monarch and Rufous Fantail

These bird species have similar preferred habitats (riparian areas and immediately adjacent woodland), occurrences in the region (more likely to be present in the Project area during the cooler months) and ecologies. None of these species is likely to breed in the Project area. The impact of habitat loss for these species as a result of the Project is negligible, as habitats of

<sup>&</sup>lt;sup>19</sup> If the nesting birds are breeding, work around the nest should cease until breeding and fledging are complete.

<sup>&</sup>lt;sup>20</sup> Tramp ants are a particular threat to ground nesting birds.

<sup>&</sup>lt;sup>21</sup> If the nesting birds are breeding, work around the nest should cease until breeding and fledging are complete.

similar type and quality are abundant in the immediate and local landscape. To ensure projectrelated threats are controlled and minimised, it is recommended that the Project design maximises the use of existing disturbed areas and minimises clearing extents in riparian areas (*ie* the areas of suitable habitat). If this occurs, significant impacts to these species are not anticipated.

#### Short-beaked Echidna

All areas of remnant vegetation in the Project area are considered suitable habitat for Shortbeaked Echidna. The impact of habitat loss for this species as a result of the Project is negligible as habitats of similar type and quality are abundant in the immediate and local landscape. Vegetation clearing has the potential to kill or injure Short-beaked Echidna that may occur in the Project area. A pre-clearing survey prior to vegetation clearing, and a spottercatcher present during vegetation clearing and trench excavation, is recommended.

Measures to manage the potential impacts on fauna values are summarised below (where applicable these should be included in the Project CEMP). These recommendations are in addition to those already provided.

Recommendation 26:	When possible ( <i>eg</i> on the edge of the construction corridor), large trees with hollows should not be removed as these trees provide nesting and roosting sites for birds and mammals. A buffer, at least equivalent to the diameter of the canopy, should be maintained to reduce the risk of root damage during clearing of surrounding vegetation ( <i>eg</i> use flagging tape to mark locations of large trees and buffer boundaries).
Recommendation 27:	A project-specific Species Management Plan (or equivalent) should be developed and implemented as part of pre-construction activities. Measures outlined in the plan should include the following.
	• A pre-clearance survey to determine the presence of fauna and fauna breeding places by appropriately trained persons prior to disturbance.
	• Contingency plans ( <i>ie</i> a spotter-catcher present during works) should be in place should wildlife be encountered injured during construction.
Recommendation 28:	A Project Weed and Pest Management Plan (or equivalent) should be developed and implemented. The plan should address weed and pest ( <i>eg</i> invasive ants) prevention/hygiene, control and monitoring.
Recommendation 29:	Avoid operating machinery, vehicles and equipment in long grass, particularly during the dry season, to minimise potential for igniting bush fires.
Recommendation 30:	Maintain fire response equipment on-site and train site staff in their use and response procedures; ensuring sufficient water is available for use in firefighting.
Recommendation 31:	Following construction, rehabilitate areas mapped as 'higher suitability' on <b>Figure 9</b> with grass species suitable for Southern Black-throated Finch (this can include native and non-native species).

### 4.6 Air and noise

#### 4.6.1 Methods

A desk-based assessment was conducted to determine the air and noise values in the Project area. The desk-based assessment included a review of Queensland Globe aerial imagery (accessed via <u>https://qldglobe.information.qld.gov.au/qldglobe/</u>) to identify potential sources of air and noise pollution and sensitive receptors.

#### 4.6.2 Description of environmental values

The area within and surrounding the Project area is generally rural land use and contains natural ecosystems, agricultural land, residential dwellings and government/privately owned infrastructure (*eg* roads, irrigation channels). The closest residential dwelling is 150 m from the Project area on Lot 71 SP289517 (Rapisrada property).

The environmental values for air include qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems; human health and wellbeing; protecting the aesthetics of the environment; and protecting agricultural use of the environment. The environmental values for noise include the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; human health and wellbeing; and protecting the amenity of the community.

Existing air quality pollutants in the Project area are likely to be primarily particulate emissions (*ie* dust) and fumes (*eg* from vehicle and machinery exhaust) commensurate with rural land use activities. Potential sources of particulate emissions from the surrounding environment comprise natural wind erosion (which may be exacerbated by disturbance from grazing activities), vehicles on unsealed roads, and smoke. Vehicles and machinery are the primary source of fumes.

The main noise and vibration producing source in the Project area is traffic along the statecontrolled roads (*ie* Ayr Ravenswood Road and Ayr Dalbeg Road). Other minor roads and rail lines and agricultural machinery within/near to the Project area are a source of noise and vibration.

#### 4.6.3 Potential impact and mitigation measures

The primary sources or air pollutants from the Project are particulate emissions (eg dust from earthworks and vehicle movements) and fumes (eg from vehicle use). Excessive dust from the Project has the potential to be a nuisance at the nearby sensitive receptors, or impact on the health of the by inhibiting physiological processes such as photosynthesis and transpiration.

The primary source of noise and vibration for the Project are expected to be from vehicle and machinery use during construction. Sensitive receptors likely to be impacted by noise and vibrations from the Project include residential properties and nearby fauna habitats.

Measures to manage the potential Project impacts on air and noise are provided below (where applicable these should be included in the Project CEMP). These recommendations are in addition to those already provided.

# **Recommendation 32:** Dust suppression to be implemented during the construction phase of the Project, to reduce mobilisation of particulates during dry and/or windy conditions.

Recommendation 33:	Keep soil stockpile heights low ( $<2$ m) and revegetate if they are to remain for $>4$ weeks (in the interim apply mulch, or appropriate soil binder to avoid wind erosion).
Recommendation 34:	Rehabilitate disturbed areas as soon as practicable to restore ground cover and minimise wind erosion.
Recommendation 35:	Maintain vehicles and machinery according to manufacturer specifications to minimise exhaust emissions and noise volume.
Recommendation 36:	Fit and maintain appropriate noise control devices ( <i>eg</i> mufflers) on vehicles and machinery used on-site.
Recommendation 37:	Undertake works during approved operating hours, and notify landholders of works that have the potential to cause a nuisance ( <i>eg</i> excavation works, compaction activities, drilling).

## 5. State and Commonwealth Legislation

Commonwealth and State legislation specifies the manner in which activities can be carried out and the permit requirements for particular activities. Environmental legislation potentially relevant to the development of the Project is provided in **Appendix K**. This is informed by written pre-lodgement advice from the State provided on 7 January 2021 (Queensland Government 2021)<sup>22</sup>.

The opinions expressed in this section and **Appendix K** are based on the technical and practical experience of expert environmental practitioners. They are not presented as legal advice. Nor do they represent decisions from the regulatory agencies charged with the administration of the relevant acts. Any legislation or code of practice referenced in this section is understood to be current at the time of writing. The information provided is restricted to environmental legislation and approvals.

<sup>&</sup>lt;sup>22</sup>Following a pre-lodgement meeting held with relevant Queensland Government regulators on 23 December 2020.

## 6. Conclusion

The Project has the potential to impact on the following:

- water environmental values including:
  - watercourses (under the Water Act)
  - low, medium and high risk waterways (WWBW)
    - wetlands that are:
      - o DIWA wetlands
      - riverine and lacustrine wetlands
- soils with varying degrees of susceptibility to erosion
- flora environmental values including:
  - vegetation communities that are:
    - o REs with a Least Concern or Of Concern VM Act Status
    - o REs with a BD status of No Concern at Present, Of Concern and Endangered
    - regulated vegetation (Categories B, R and X)
  - one T&NT flora species
- fauna environmental values including:
  - fauna habitat values (*eg* breeding and roosting places, essential habitat)
  - five T&NT fauna species
  - nine Migratory and/or Special Least Concern fauna species.
- air and noise environmental values.

Potential impacts to these environmental values can be prevented or reduced by implementing the recommendations and mitigation measures outlined in **Section 4**. Provided these measures are implemented, significant impacts to environmental values are not anticipated.

Supplementary studies (*ie* desk-based and/or field) and review of this EAR will be required if material changes are made to the Project design as described in this report.

## 7. References

Accad, A, Kelley, JAR, Richter, D, Neldner, VJ, & Li, J 2021, *Remnant Regional Ecosystem Vegetation in Queensland, Analysis 1997-2019*, Queensland Department of Environment and Science, Brisbane.

ALA 2021, Atlas of Living Australia, Commonwealth Scientific and Industrial Research Organisation, Canberra, viewed 1 July 2021, <a href="https://www.ala.org.au">https://www.ala.org.au</a>.

Aplin, K, Dickman, C, Salas, L & Helgen, K 2016, *Tachyglossus aculeatus*. *The IUCN Red List of Threatened Species 2016*, viewed 2 July 2021, <a href="https://www.iucnredlist.org/">https://www.iucnredlist.org/</a>>.

BoM 2021, Weather data for Ayr DPI Research Station (Station 33002), Bureau of Meteorology, viewed 7 July 2021, <a href="http://www.bom.gov.au/>">http://www.bom.gov.au/></a>.

BSC 2011, Burdekin Shire IPA Planning Scheme 2011, Burdekin Shire Council, Queensland.

BSC undated, *Burdekin Shire Council Biosecurity Plan Draft v 2.0 2020-2025*, Burdekin Shire Council.

Buosi, PA, Vanderduys, EP, Grice, AC & Reside, AE in press, 'Southern Black-throated Finch *Poephila cincta cincta*', in ST Garnett & GB Baker (eds), *Action Plan for Australian Birds* 2020, CSIRO, Melbourne.

Churchill, S 2008, Australian Bats, Second Edition, Allen & Unwin, Crows Nest.

Compton, A & Johnson, PM 1983, 'Observations of the Sheath-tailed Bat: *Taphozous* saccolaimus Temminck (Chiroptera: Emballonuridae), in the Townsville region of Queensland', *Aust Mamm* 6:83–87.

DAF 2016, *Queensland waterways for waterway barrier works*, Queensland Department of Agriculture and Fisheries, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.</u> <u>qld.gov.au/</u>>.

DAF 2018, Accepted development requirements for operational work that is constructing or raising waterway barrier works, Queensland Department of Agriculture and Fisheries, Brisbane.

DAWE 2021a, *EPBC Act Protected Matters Report*, Commonwealth Department of Agriculture, Water and the Environment, Canberra, viewed 1 July 2021, <a href="https://www.environment.gov.au">https://www.environment.gov.au</a>.

DAWE 2021b, *Directory of Important Wetlands in Australia*, Commonwealth Department of Agriculture, Water and the Environment, Canberra, viewed 7 July 2021, <a href="https://www.environment.gov.au">https://www.environment.gov.au</a>.

DAWE 2021c, *The Ramsar Convention on Wetlands*, Commonwealth Department of Agriculture, Water and the Environment, Canberra, viewed 7 July 2021, <a href="https://www.environment.gov.au">https://www.environment.gov.au</a>.

DAWE 2021d, *Crocodylus porosus in Species Profile and Threats Database*, Commonwealth Department of Agriculture, Water and the Environment, Canberra, viewed 2 July 2021, <a href="http://www.environment.gov.au/sprat">http://www.environment.gov.au/sprat</a>>.

DES 2018, A Biodiversity Planning Assessment for the Brigalow Belt Bioregion, Version 2.1 Summary Report, Queensland Department of Environment and Science, Brisbane.

DES 2019a, *Land use mapping – 1999 to Current – Queensland*, Queensland Department of Environment and Science, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.</u> <u>qld.gov.au/</u>>.

DES 2019b, *Wetland data – version 5 - wetland areas – Queensland*, Queensland Department of Environment and Science, Brisbane, viewed 7 May 2021, <<u>https://qldglobe.information.</u><u>qld.gov.au/</u>>.

DES 2019c, *Flora Survey Trigger Map for Clearing Protected Plants in Queensland – Version* 7.1, Queensland Department of Environment and Science, Brisbane, viewed 7 May 2021, <<u>https://qldglobe.information.qld.gov.au/</u>>.

DES 2020a, *Wetland protection area - GBR high ecological significance wetland*, Queensland Department of Environment and Science, Brisbane, viewed 7 May 2021, <<u>https://qldglobe.</u> information.qld.gov.au/>.

DES 2020b, Flora Survey Guidelines – Protected Plants, Nature Conservation Act 1992 (version 2.01, 22 August 2020), Queensland Department of Environment and Science, Brisbane.

DES 2021a, Regional Ecosystem Description Database, Version 12, Queensland Department of Environment and Science, Brisbane, March 2021.

DES 2021b, *Matters of State Environmental Significance Environmental Report*, Queensland Department of Environment and Science, Brisbane, viewed 7 July 2021, <a href="https://apps.des.gld.gov.au">https://apps.des.gld.gov.au</a>.

DES 2021c, *WildNet Taxon List for Queensland*, Queensland Department of Environment and Science, Brisbane, viewed 1 July 2021, <a href="https://www.qld.gov.au">https://www.qld.gov.au</a>.

DES 2021d, *Remnant 2019 broad vegetation groups – Queensland*, Queensland Department of Environment and Science, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.</u> <u>qld.gov.au/</u>>.

DEWHA 2008, *Approved Conservation Advice for Eucalyptus raveretiana (Black Ironbox)*, Commonwealth Department of the Environment and Energy, 16 December 2008.

DEWHA 2009, Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta), Australian Department of Environment, Water, Heritage and the Arts, Canberra.

DEWHA 2010, *Survey guidelines for Australia's threatened bats*, Australian Department of Environment, Water Heritage and the Arts, Canberra.

DNRME 2019, *Riverine protection permit exemption requirements: WSS/2013/726: Version 2.01*, Queensland Department of Natural Resources, Mines and Energy, Brisbane.

DoR 2018, *Detailed surface geology – Queensland*, Queensland Department of Resources, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.qld.gov.au/</u>>.

DoR 2021a, Vegetation management watercourse and drainage feature map (1:100000 and 1:250000) – Queensland except South East Queensland Version 4.0, Queensland Department of Resources, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.qld.gov.au/</u>>.

DoR 2021b, Vegetation management regional ecosystem map – version 11.0 – By Area Of Interest, Queensland Department of Resources, Brisbane, viewed 2 June 2021, <https://qldglobe.information.qld.gov.au/>.

DoR 2021c, Vegetation management regulated vegetation management map – version 4.13, Queensland Department of Resources, Brisbane, viewed 2 June 2021, <a href="https://qldglobe.information.qld.gov.au/">https://qldglobe.information.qld.gov.au/</a>>.

DoR 2021d, Vegetation management essential habitat map no attribute - version 9.14, Queensland Department of Resources, Brisbane, viewed 2 June 2021, <a href="https://qldglobe.information.qld.gov.au/">https://qldglobe.information.qld.gov.au/</a>>.

DRDMW 2021, *Watercourse identification map - Queensland series*, Queensland Department of Regional Development, Manufacturing and Water, Brisbane, viewed 7 July 2021, <<u>https://qldglobe.information.qld.gov.au/</u>>.

Higgins, PJ 1999, Handbook of Australian, New Zealand and Antarctic Birds. Volume Four -Parrots to Dollarbird, Oxford University Press, Melbourne.

Lumsden, L 2017, *Saccolaimus saccolaimus*, in *The IUCN Red List of Threatened Species* 2017, viewed 3 July 2021, https://www.iucnredlist.org/.

Menkhorst, P, Rogers, D, Clarke, R, Davies, J, Marsack, P & Franklin, K 2019, *The Australian Bird Guide (Revised Edition)*, CSIRO Publishing, Victoria.

Milne, DJ & Pavey, CR 2011, 'The status and conservation of bats in the Northern Territory', in B Law, P Eby, D Lunney & L Lumsden (eds), *The Biology and Conservation of Australasian Bats*, Royal Zoological Society of NSW, Mosman, Australia.

Mitchell, DF 1996, *Foraging Ecology of the Black-throated Finch Poephila cincta cincta*, MSc thesis, James Cook University of North Queensland, Townsville.

Mula-Laguna J, Reside AE, Kutt A, Grice AC, Buosi P, Vanderduys EP, Taylor M & Schwarzkopf L 2019, 'Conserving the endangered Black-throated Finch southern subspecies: What do we need to know?', *Emu*, 119: 1–15.

Murphy, S 2002, 'Observations of the 'Critically Endangered' Bare-rumped Sheathtail Bat *Saccolaimus saccolaimus* Temminck (Chiroptera: Emballonuridae) on Cape York Peninsula, Queensland', *Aust Mamm*, 23: 185–187.

Neldner, VJ, Niehus, RE, Wilson, BA, McDonald, WJF, Ford, AJ & Accad, A 2019, *The Vegetation of Queensland. Descriptions of Broad Vegetation Groups, Version 4.0*, Queensland Herbarium, Department of Environment and Science, Brisbane.

Neldner, VJ, Wilson, BA, Dillewaard, HA, Ryan, TS, Butler, DW, McDonald, WJF, Addicott, EP & Appelman, CN 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.

Nicol, S & Anderson, N 2007, 'The history of an egg-laying mammal, the echidna (*Tachyglossus aculeatus*)', *Ecoscience*, 14: 275–285.

NQDT 2014, Regional Pest Management Strategy 2014 - 2019 for the Burdekin Dry Tropics, NQ Dry Tropics, Townsville.

NRA 2005, Enertrade North Queensland Gas Pipeline –Black-throated Finch Studies (Postconstruction), prepared by NRA Environmental Consultants for Enertrade, 3 February 2005.

NRA 2007, Review of the Ecology, Threats and Management Requirements of the Blackthroated Finch (Poephila cincta cincta) to Support Assessment Process under the Environment Protection and Biodiversity Conservation Act 1999, prepared by NRA Environmental Consultants for Australian Department of Environment, Water, Heritage and the Arts, 14 June 2007.

NRA 2011, Habitat Management Guidelines for the Black-throated Finch (Poephila cincta cincta) in the Brigalow Belt North Bioregion, prepared by NRA Environmental Consultants for NQ Dry Tropics on behalf of the Black-throated Finch Trust, 19 August 2011.

NRA 2018, *Haughton Pipeline Duplication Project: Environmental Analysis Report, R05*, prepared by NRA Environmental Consultants for GHD, Date of Issue 31 May 2018.

Queensland Government 2021, 2012-20139 SPL: 12537606 - Haughton Pipeline Duplication Stage 2: Pre-lodgement meeting record, Queensland Government State Assessment and Referral Agency, 7 January 2021.

Rechetelo, J, Grice, A, Reside, AE, Hardesty, BD, & Moloney, J 2016, 'Movement patterns, home range size and habitat selection of an endangered resource tracking species, the Black-throated Finch (*Poephila cincta cincta*)', *PLoS ONE*, 11: e0167254.

Reid RE & Baker DE 1984, Soils of the Lower Burdekin River – Barratta Creek-Haughton River Area, North Queensland, Technical Report 22, Queensland Department of Primary Industries, Brisbane.

Reside, A, Vanderduys, E, Fabricius, K & Evans-Illidge, L 2015, 'The unfortunate end of a Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus subspecies nudicluniatus*) roost on Magnetic Island', *The Australasian Bat Society Newsletter*, 45: 19–21.

Sattler, PS & Williams, R (eds) 1999, *The conservation status of Queensland's bioregional ecosystems*, Queensland Environmental Protection Agency.

Squatter Pigeon Workshop 2011, *Proceedings from the workshop for the Squatter Pigeon* (*southern*), 14–15 December 2011, Toowoomba Office of Queensland Parks and Wildlife Service.

Strahler, AN, 1957, 'Quantitative analysis of watershed geomorphology', *Transactions of the American Geophysical Union*, 38: 913–920.

Thompson, WP, Cannon, MG, Reid, RE & Baker, DE 1990, Soils of the Lower Burdekin Valley, North Queensland: Redbank Creek to Bob's Creek and south to Bowen River, Queensland Department of Primary Industries, Brisbane.

Weeds Australia 2021, *Weeds of National Significance (WONS)*, Weeds Australia, Centre for Invasive Species Solutions, viewed 5 July 2021, <a href="https://weeds.org.au/>">https://weeds.org.au/></a>.

Wieneke J 1989, *Birds of Townsville and Where to Find Them*, Wildlife Preservation Society of Queensland.

Woinarski, JCZ, Burbidge, AA & Harrison, PL 2014, *The Action Plan for Australian Mammals 2012*, CSIRO Publishing, Australia.

Zann, R 1976, 'Distribution, status and breeding of Black-throated finches *Poephila cincta* in northern Queensland', *Emu*, 76: 201–206.

Appendix A: EPBC Act Protected Matters Search Report



Australian Government

Department of Agriculture, Water and the Environment

## **EPBC Act Protected Matters Report**

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

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

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

Report created: 01/07/21 08:23:24

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



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

<u>Coordinates</u> Buffer: 20.0Km



### Summary

#### Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	24
Listed Migratory Species:	18

#### Other Matters Protected by the EPBC Act

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

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

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

None
None
22
None
None
None
None

#### Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	32
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

## Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Bowling green bay	10 - 20km upstream

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the dis plans, State vegetation maps, remote sensing imager community distributions are less well known, existing produce indicative distribution maps.	tribution is well known, map ry and other sources. Where vegetation maps and point	es are derived from recovery e threatened ecological location data are used to
Name	Status	Type of Presence
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Ervthrotriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda		
Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Poephila cincta cincta		
Southern Black-throated Finch [64447]	Endangered	Species or species habitat known to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix olivii		
Buff-breasted Button-quail [59293]	Endangered	Species or species habitat may occur within area
<u>Tyto novaehollandiae kimberli</u>		
Masked Owl (northern) [26048]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Mammals		
Dasyurus hallucatus		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
<u>Hipposideros semoni</u>		
Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat [180]	Vulnerable	Species or species habitat may occur within area
<u>Macroderma gigas</u> Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, N Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	ISW and the ACT) Vulnerable	Species or species habitat likely to occur within area
Saccolaimus saccolaimus nudicluniatus		
Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat likely to occur within area
Plants		
<u>Dichanthium setosum</u> bluegrass [14159]	Vulnerable	Species or species habitat known to occur within area
<u>Eucalyptus raveretiana</u>		
Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Marsdenia brevifolia		
[64585]	Vulnerable	Species or species habitat may occur within area
<u>Omphalea celata</u>		
[64586]	Vulnerable	Species or species habitat likely to occur within area
Tephrosia leveillei		
[16946]	Vulnerable	Species or species habitat may occur within area
Reptiles		
<u>Denisonia maculata</u>		
Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat likely to occur within area
Lerista vittata Mount Cooper Striped Skink, Mount Cooper Striped Lerista [1308]	Vulnerable	Species or species habitat may occur within area
Sharks		
Pristis pristis		<b>.</b>
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on th	e EPBC Act - Threatened	Species list.
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<u>Crocodylus porosus</u> Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
<u>Pristis pristis</u> Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Migratory Terrestrial Species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat may occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
<u>Motacilla flava</u> Yellow Wagtail [644]		Species or species habitat may occur within area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat known to occur within area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

## Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the	ne EPBC Act - Threatened	Species list.
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat likely to occur within area
Anseranas semipalmata		
Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<u>Ardea ibis</u>		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
<u>Gallinago hardwickii</u>		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis		
Black-faced Monarch [609]		Species or species habitat may occur within area
Monarcha trivirgatus		
Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
<u>Myiagra cyanoleuca</u>		
Satin Flycatcher [612]		Species or species habitat

Name	Threatened	Type of Presence
		within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Reptiles		
Crocodylus porosus		
Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area

## Extra Information

Invasive Species		[Resource Information]			
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.					
Name	Status	Type of Presence			
Birds					
Acridotheres tristis					
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area			
Anas platyrhynchos					
Mallard [974]		Species or species habitat likely to occur within area			
Columba livia					
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area			
Lonchura punctulata					
Nutmeg Mannikin [399]		Species or species habitat likely to occur within area			
Passer domesticus					
House Sparrow [405]		Species or species habitat likely to occur within area			
Streptopelia chinensis					
Spotted Turtle-Dove [780]		Species or species			

Na	me
----	----

Sturnus vulgaris Common Starling [389]

#### Frogs

Rhinella marina Cane Toad [83218]

#### Mammals

Bos taurus Domestic Cattle [16]

Canis lupus familiaris Domestic Dog [82654]

Capra hircus Goat [2]

Equus caballus Horse [5]

Felis catus Cat, House Cat, Domestic Cat [19]

Feral deer Feral deer species in Australia [85733]

Lepus capensis Brown Hare [127]

Mus musculus House Mouse [120]

Oryctolagus cuniculus Rabbit, European Rabbit [128]

Rattus rattus Black Rat, Ship Rat [84]

Sus scrofa Pig [6]

Vulpes vulpes Red Fox, Fox [18]

#### Plants

Acacia nilotica subsp. indica Prickly Acacia [6196]

Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913] Type of Presence habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat known to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat may occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

#### Status

Name	Status	Type of Presence
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507] Lantana camara		Species or species habitat likely to occur within area
Lantana, Common Lantana, Kamara Lantana, Large- leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Parkinsonia aculeata		Species or species habitat likely to occur within area
Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]		Species or species habitat likely to occur within area
Reptiles		
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area
Nationally Important Wetlands		[Resource Information]
Name		State
Barrattas Channels Aggregation Haughton Balancing Storage Aggregation		QLD QLD
# Caveat

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

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

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

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

- migratory and

- marine

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

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

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

- non-threatened seabirds which have only been mapped for recorded breeding sites

- seals which have only been mapped for breeding sites near the Australian continent

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

# Coordinates

-19.82963 147.13252

# Acknowledgements

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

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

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

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

© Commonwealth of Australia Department of Agriculture Water and the Environment GPO Box 858 Canberra City ACT 2601 Australia +61 2 6274 1111

# Appendix B: Queensland Government Wetland Mapping

# WetlandMaps Report



For selected area of interest Current as at 07/07/2021

## **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 <u>Wetland Mapping and Classification Methodology</u>.

## 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.

The user accepts sole responsibility and risk associated with the use and results of department data hosted on this website, irrespective of the purpose to which such use or results are applied. It is recommended that users consider independently verifying any information obtained from this website.

To the maximum extent permitted by applicable law, in no event shall the department be liable for any special, incidental, indirect, or consequential loss whatsoever (including, but not limited to, damages for loss of profits or confidential or other information, for business interruption, for personal injury, for loss of privacy, for failure to meet any duty including of good faith or of reasonable care, for negligence, for any other pecuniary or other loss whatsoever including, without limitation, legal costs on a solicitor own client basis) arising out of, or in any way related to, the use of or inability to use the data.

## **Summary Information**

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

## Table 1. Area of interest details

Size (ha)	167.42
Local Government(s)	Burdekin Shire
Bioregion(s)	Brigalow Belt
Subregion(s)	Townsville Plains
Catchment(s)	Burdekin, Haughton
Drainage sub-basin	Lower Burdekin River, Barratta Creek

## 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:

WetlandSummary tool: https://wetlandinfo.des.qld.gov.au/wetlands/facts-maps/

Queensland Spatial Catalogue: http://gldspatial.information.gld.gov.au/catalogue/custom/index.page

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

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

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

Groundwater Dependant Ecosystems information:

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







## Legend

## **Queensland Wetlands of Importance Map**





## Wetland habitat types in the AOI. Total area: 8.2ha

Wetland Class	Habitat type	Area (ha)
Riverine	Riverine	8.08
Lacustrine	Artificial/ highly modified wetlands (dams, ring tanks, irrigation channel	0.12

# 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	<u>Great Artesian Basin spring wetlands</u>
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	<u>Arid swamps</u> <u>Semi-Arid swamps</u>
Arid and semi-arid fresh non-floodplain tree swamps of all substrates and water regimes	Arid and semi-arid non-floodplain tree swamps	<u>Arid swamps</u> <u>Semi-Arid swamps</u>
Arid and semi-arid fresh non-floodplain lignum swamps of all substrates and water regimes	Arid and semi-arid non-floodplain lignum swamps	<u>Arid swamps</u> <u>Semi-Arid swamps</u>
Arid and semi-arid fresh non-floodplain grass, sedge, herb swamps of all substrates and water regimes	<u>Arid and semi-arid non-floodplain grass, sedge,</u> <u>herb swamps</u>	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	<u>Great Artesian Basin spring wetlands</u>
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	<u>Arid and semi-arid fresh non-floodplain lakes</u> ( <u>clay pans)</u>	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

Appendix C: Directory of Important Wetlands Australia Listings

# **Directory of Important Wetlands Australia: Listings**

## Haughton Balancing Storage Aggregation – QLD200

Level of importance:	National - Directory
Location:	On the floodplain between the Burdekin and Haughton rivers, with a central point at about 19 degrees 43' 19" S, 147 degrees 04' 38" E. It is 38 km southwest of Ayr.
Biogeographic region:	Brigalow Belt North
Shire:	Burdekin
Area:	213 ha
Elevation:	25m AHD
Other listed wetlands in same aggregation:	None
Wetland type:	C1
Criteria for inclusion:	3

## Site description:

## Physical features:

This storage is part of the Haughton Main Channel system, a water distribution system that carries water from the Burdekin River to the Haughton. The channel is one of three main distribution systems that comprise the Burdekin Irrigation Scheme. It is a shallow impoundment that is often almost entirely occupied by aquatic plants. It is locally and probably regionally important for waterbirds. These are very easily observed from the retaining wall of the storage. The retaining wall on the eastern side of the storage is constructed of broken rock and earth. Landform is an alluvial plain. Geology/soils: Cainozoic alluvial deposits. Cracking clays which are strongly alkaline by 60cm (Reid and Baker 1984)

## Hydrological features:

The Haughton Main Channel has a flow capacity of about 7.6 cubic metres per second, and the balancing storage is intended to provide a reservoir that will maintain this flow (QWRC 1980). During a brief visit to the storage on 9 December 1999 the water in it was observed to be very turbid, and coffee coloured with a bluish tinge. The maximum depth is unknown but it is unlikely to be much greater than 2 m. The site is located in the Barrattas subcatchment of the Burdekin. The Barrattas are a complex system of intertwining stream channels and drainage depressions on the floodplain between the Burdekin and Haughton rivers. They play an important role in distributing floodwaters from these rivers and are used as a drain for irrigation tail waters.

## Ecological features:

Artificially flooded palustrine wetland dominated by persistent emergents (*Typha* spp). Artificially flooded lacustrine littoral wetland dominated by rooted vascular aquatic bed. Artificially flooded lacustrine littoral wetland dominated by floating leaved aquatic bed. Artificially flooded lacustrine littoral wetland dominated by algal aquatic bed. These were observed on 9 December 1999. The emergent wetland is most likely quite stable in position and composition, the other types probably vary in position, composition and relative abundance.

## Significance:

The site supports rich and extensive beds of aquatic plants which provide food and breeding sites for a wide range of water birds. Because water levels are maintained in the storage, the site has potential to be an important drought refuge for water birds. The long retaining wall, which has a road on it, provides a convenient viewing platform for bird watching, whilst minimising disturbance to the birds. This convenience and the site's proximity to Townsville give it potential to be a popular bird watching site, although access is currently restricted.

### Notable flora:

Nymphoides indica, Myriophyllum verrucosum, floating algal mats, Azolla pinnata, Hydrilla verticillata, Potomogeton crispus, Typha spp and Blyxa aubertii.

## Notable fauna:

During a brief visit on 9/12/1999 at least 200 black swans (Cygnus atratus), many magpie geese (Anseranas semipalmata), intermediate egrets (Ardea intermedia), comb-crested jacana (Irediparra gallinacea), darters (Anhinga melanogaster), yellow billed spoonbills (Platalea flavipes), royal spoonbills (Platalea regia), Caspian terns (Sterna caspia) and little black cormorants (Phalacrocorax sulcirostris), a few great egrets (Ardea alba) and a whitebellied sea-eagle (Haliaeetus leucogaster) (EPBC Migratory) were observed. Also recorded on the storage are blacknecked stork (Ephippiorhynchus asiaticus) (Sr), the crimson finch (Neochmia phaeton iredalei) (Sv), black chinned honeyeater (Melthreptus gularis) (Sr), and fork tailed swift (Apus pacificus) (EPBC Migratory). Other species are grey teal (Anas gracilis), Pacific black duck (Anas superciliosa), white-necked heron (Ardea pacifica), Australian wood duck (Chenonetta jubata), wandering whistling-duck (Dendrocygna arcuata), plumed whistling-duck (Dendrocygna eytoni), little egret (Egretta garzetta), white-faced heron (Egretta novaehollandiae), black-fronted dotterel (Elsevornis melanops), buff-banded rail (Gallirallus philippensis), brolga (Grus rubicunda), nankeen night heron (Nycticorax caledonicus), great cormorant (Phalacrocorax carbo), little pied cormorant (Phalacrocorax melanoleucos), little black cormorant (Phalacrocorax sulcirostris), purple swamphen (Porphyrio porphyrio), Australasian grebe (Tachybaptus novaehollandiae), Australian white ibis (Threskiornis molucca), straw-necked ibis (Threskiornis spinicollis), forest kingfisher (Todiramphus macleavii), sacred kingfisher (Todiramphus sanctus) and red-backed kingfisher (Todiramphus pyrrhopygia). Glass shrimp, mussels and snails were observed to be common amongst the aquatic beds. The spectacled hare wallaby (Largochestes conspicillatus) has been observed adjacent to the retaining wall.

## Other Fauna:

Social and Cultural values:

Water birds are very easily observed from the retaining wall of the storage. Access is currently restricted. If it were to be made more open it is likely that this site would acquire considerable renown as a bird watching site.

Land tenure:

On site: Water reserve. Surrounding areas: State land, freehold, and leasehold

Current land use:

This site is part of or adjacent to a modified water body currently managed for the primary purpose of water supply infrastructure and that also serves as a wetland. Notwithstanding that this is a modified or constructed wetland, the site does have biodiversity values that are consistent with the criteria for listing an important wetland on the DIWA. As the site is being operated as water supply infrastructure from time to time the management entity will need to undertake management actions and practices to maintain or enhance the supply of water to users. While such actions may not be undertaken for the primary purpose of protection of the environmental values, such activities need not be inconsistent with listing of the site on the DIWA. Similarly, listing on the DIWA does not preclude a possible future upgrade or other development of the current infrastructure. Any future modification or development of the water supply infrastructure should be assessed on merit as part of the requisite environmental assessment and approval process. On site: Balancing storage for irrigation waters. Surrounding areas: Horticulture (sugar cane), extensive grazing.

### Disturbance or threat:

Current: The storage has been invaded by the aggressive aquatic grass *Hymenachne amplexicaulis*. Potential: None apparent.

### Conservation measures taken:

Apparently successful control of Hymenachne. An integrated catchment management plan is being developed for the Haughton, which recognises the wetland values and aims at constructive upstream management to preserve these values.

Management authority and jurisdiction: SunWater.

## References:

Blackman, JG et al. (2002); Queensland Water Resources Commission (1980); Reid, RE & Baker, DE (1984). See Queensland Reference List

Compiler & date: Perry, TW, 2001. Edited Deacon, G, and Miller, GJ, 2004.

Drainage:

AWRC Division: North-East Coast AWRC Region: BURDEKIN AWRC Basin: HAUGHTON RIVER Catchment: Haughton River Sub-catchment:

## Barratta Channels Aggregation – QLD196

Level of importance:	National - Directory
Location:	The Barrattas are a distributary system on the floodplain between the Haughton and Burdekin rivers. The site extends from the Bruce Highway 30 km south southwest to Woodhouse Mountain, and ranges in width from 1 to 5 km. The centre of the site is at 19 degrees 41' 32" S, 147 degrees 09' 30" E, about 29 km west southwest of Ayr.
Biogeographic region:	Brigalow Belt North
Shire:	Burdekin
Area:	7 118 ha.
Elevation:	8-30m AHD
Other listed wetlands in same aggregation:	Immediately upstream of the Jerona Aggregation (QLD201) which is part of the Burdekin-Townsville Coastal Aggregation (QLD005).
Wetland type:	B2, B4, B14, B10, A9
Criteria for inclusion:	1, 2, 3, 5,

Site description:

Physical features:

A complex of distributary channels and drainage depressions, which appear to have been superimposed on a former delta of the Burdekin. Landform pattern is a flood plain with the landform elements of backplain, bank, bar, drainage depression, levee, plain, stream bed, stream channel, and swamp. Quaternary alluvium. Alkaline duplex or cracking grey clay with varying degrees of gilgai. These soils are poorly drained and the subsoil of the duplexes tends to be strongly sodic.

## Hydrological features:

The source of Barratta Creek is in the Leichhardt Range, near Blue Mountain. For the early part of its course it is an ordinary small stream flowing from the coastal ranges onto the coastal plain. In the latter part of its course (i.e. to the north of Woodhouse Mountain) it spreads out and becomes a functioning part of the Burdekin-Haughton floodplain. During large floods of the Burdekin, floodwaters overtop the left bank levee in the vicinity of Clare and flow into the Barrattas system. It has been estimated that this will happen when discharge reaches 28,000 cubic metres per second. This discharge has been exceeded at least five times between 1919 and 1999. Large floods in the Haughton also occasionally spill over into the Barrattas, but less commonly than for the Burdekin. Flood peaks in the Burdekin

and Haughton rarely coincide. It appears that the Haughton was once a tributary of the Burdekin, joining it somewhere west of Clare. Barratta Creek then probably joined the Haughton or the Burdekin somewhere near there. At this time the coastline was probably about 5 km north of the northern end of the site (about 11 km south of the present coast line) and the area now occupied by it and the Jerona Aggregation would have constituted the focal part of the Burdekin-Haughton delta. Superficial sediments laid down by the Barrattas have since obscured this. It is probable that occasional very large Burdekin/Haughton floods, larger than any recorded, have played a significant role in scouring out channels and creating deep waterholes and other flood plain features on the site. A gauging station has operated on the main channel, at Northcote near the centre of the site since 1974. Up until 1986 the channel rarely carried flowing water for more than four months during the wet season. Since late 1987 flow has been continuous. In 1986 the Burdekin Falls Dam was completed and shortly thereafter irrigation of the flood plain between the Burdekin and the Haughton was expanded. Other stations have been located on the Barrattas since 1992 mainly to gauge the effects of irrigation tail waters on the system. Water quality results from these indicate that irrigation tail water entering the system has higher levels of nitrogen, phosphorous and organochlorides than waters naturally entering the system.

### Ecological features:

Intermittent riverine, streambed, unconsolidated shore and aquatic bed. Palustrine, emergents, aquatic bed, and unconsolidated shore.

### Significance:

The site provides a very good representative example of a flood distributary system on a large tropical flood plain. It provides valuable insights into the development of floodplains. The site represents some of the best remaining habitat on the lower Burdekin. It has been estimated that the majority of small mammals remaining on the lower Burdekin floodplain are reliant on riparian vegetation associated with the Barrattas. It is possible that the site provides critical habitat for the bare rumped sheathtail bat *Saccolaimus saccolaimus nudicluniatus* (Nce, Sr), listed as critically endangered in the Commonwealth Environmental Protection and Biodiversity Conservation Act 1999. One of very few records of this bat comes from Jerona, immediately to the north. More recent echolocation call data suggest it is still in the area. It is restricted to coastal woodland and appears to be dependent on hollows in old *Eucalyptus platyphylla* trees for roosting and breeding. This site and the adjacent Jerona probably represent the only suitable remaining habitat for it on the floodplain.

## Notable flora:

The woodland surrounding the channels is generally dominated by *Eucalyptus platyphylla* with *Corymbia tesselaris* and *Corymbia dallachiana* prominent. The main grasses are *Hetropogon contortus*, *Themeda australis* and *Allopteropsis semialata*. *Ophiuros exaltatus* and *Dichanthium annulatum* become prominent, sometimes dominant in damper, less well drained areas. Riparian strips along channels and surrounding waterholes are broadly similar to the above. They tend to be denser, more diverse and *Melaleuca fluviatilis*, swamp tea-tree (*Melaleuca dealbata*) and weeping cabbage palm (*Livistona decipiens*) are commonly prominent or dominant. Some patches of riparian vegetation are so dense and diverse that they have a rainforest feel about them. The area upstream of the main bridge on the Clare-Giru road is a good example. Other species recorded in riparian strips on the site are listed below: Leichhardt tree (*Nauclea orientalis*), creek sandpaper fig (*Ficus coronata*), *Eustrephus latifolius*, *Lomandra longifolia*, broad-leaved tea-tree (*Melaleuca leucadendra*), *Ficus opposita*, red kamala (*Mallotus philippensis*), *Lysiphyllum* sp, *Gymnanthera oblonga*, *Lophostemon grandiflorus*, *Pandanus cookii*, cockatoo apple (*Planchonia careya*), *Millettia pinnata*, *Cupaniopsis anacardioides*, *Castanospora alphandii*, *Antidesma parvifolium*, *Rostellularia adscendens*, doolan (*Acacia salicina*), *Wedelia spilanthoides*, *Cyperus concinnus*, *Pterocaulon redolens*, *Phyllanthus virgatus*, *Grewia retusifolia*, and *Rhynchosia minima*.

Since irrigation in the area began, water in the system has remained permanently turbid. The effect that this has had on aquatic plants is uncertain. Beds of aquatic plants in the system tend to be scattered, sparse and dominated by emergents; this is probably a response to perennial turbidity. Species recorded in the channels and waterholes are listed below: *Pseudoraphis spinescens, Ludwidgia peploides, Nymphaea violacea*, shiny nardoo (*Marsilea mutica*), *Hydrilla verticillata, Ceratophyllum demersum, Chara* sp, *Lemna minor, Azolla filiculoides, Myriophyllum verrucosum, Typha domingensis, Potamogeton crispus, Persicaria decipiens, Nymphaea gigantaea*, swamp rice grass (*Leersia hexandra*) and *Cyperus involucratus*.

## Notable fauna:

grey teal (Anas gracilis), Pacific black duck (Anas superciliosa), plumed whistling duck (Dendrocygna eytoni), spectacled hare wallaby (Largochestes conspicillatus), and squirrel glider (Petaurus norfolkensis). Fish recorded in Barratta Creek are as follows: eastern rainbowfish (Melanotaenia splendida), bony bream (Nematolosa erebi), glass perchlet (Ambassis agassizi), fly specked hardyhead (Craterocephalus stercusmuscarum), barramundi (Lates calcarifer), tarpon (Megalops cyprinoides), northern mouth almighty (Glossamia aprion), empire gudgeon (Hypseleotris compressa), northern trout gudgeon (Morgunda morgurnda adspersa), tandan (Neosilurus species), salmon catfish (*Arius graeffei*), long finned eel (*Anguilla reinhardtii*), spangled perch (*Leiopotherapon unicolour*), milkfish (*Chanos chanos*), and banded grunter (*Amniatabia percoides*).

## Other Fauna:

Social and Cultural values: None known.

## Land tenure:

On site: The majority of the site is water reserve or State land. There is some leasehold in the south. Surrounding areas: Mainly freehold, with substantial areas of national park to the west and north.

## Current land use:

On site: The site was excluded from development during a recent expansion of the Burdekin River Irrigation Area. Some is lightly grazed; the rest is not used. Surrounding areas: Mainly horticulture (sugar cane and to a much lesser extent, mangoes) with some extensive grazing.

## Disturbance or threat:

Current: The Burdekin River Irrigation Area (BRIA) is irrigated by an open-ended system. That is, water goes in at one end and a lesser amount comes out at the other. This flow is necessary to make the system work. The water that comes out at the other end is referred to as tail water and it is causing environmental problems on the Lower Burdekin. Most of the tail water from the BRIA flows into the Barrattas system. The whole system was once seasonal but tail waters are now tending to maintain flows throughout the year. Flow in West Barratta Creek remains intermittent. Between 1989 and 1991 rainfall increased 47% but the discharge of the Barrattas increased by 323%. Tail water has higher levels of nitrogen, phosphorus and organochlorides than waters naturally entering the system. The water from the Burdekin dam is permanently turbid, having high levels of fine-grained colloidal sediments that are held in suspension. Because the water holes and distributary channels of the Barrattas system are now used as irrigation infrastructure, turbid dam water has been mixed with clearer floodplain water, resulting in environmental changes. Excessive nutrients can lead to destructive algal blooms and excessive growth of weedy species, particularly the introduced pasture grasses Brachiaria mutica and Hymenachne amplexicaulis and the native Typha species. No significant algal blooms have yet been detected (this is probably more due to high turbidity than nutrient levels); Hymenachne, however, appears to be spreading through the system. There are concerns that nutrient concentrations will increase as production increases and the nutrient adsorption capacity of recently cultivated soils is exceeded. Bothriochloa pertusa has also been recorded on site, it has the potential to displace native species but it is more of a dryland weed. Gambusia, which has the potential to eliminate native fish species, has been recorded in Barratta Creek.

Potential: Continuing neglect is probably the greatest future threat to the site. It has been excluded from cane expansion but it is a narrow strip almost surrounded by land devoted to intensive agriculture. It is unlikely that the site will retain its natural values without some monitoring and management. It must be recognised that these wetland systems, when utilised as drainage outlets, require careful management to continue to function in a beneficial manner. The site represents one of the best remaining examples of a restricted type of coastal woodland and may be crucial habitat for a species listed as critically endangered in federal legislation. It is possible that salts in the sodic subsoils of the duplex soils on the site may be mobilised as a result of changes in the water regime. Elevation of saline groundwater tables to the surface is also possible.

### Conservation measures taken:

The Barrattas floodplain has been inscribed on the Register of the National Estate (2002) for its natural values. The site has been excluded from cane expansion in recognition of these values; however there must be improved monitoring and management of the site to ensure that these values are maintained. An integrated catchment management plan is being developed for the adjacent Haughton catchment, which recognises the wetland values and aims at constructive upstream management to preserve these values.

### Management authority and jurisdiction:

Department of Natural Resources and Mines, Burdekin River Irrigation Area, Environmental Protection Agency.

## References:

Australian Centre for Tropical Freshwater Research. (1994); Australian Government (2004); Australian Heritage Commission. (2001); Blackman, J.G. et al. (2002); Congdon, R.A. & Lukacs, G.P. (1995); Congdon, R.A. & Lukacs G.P. (1996); Fleming, P.M. (1980); Hopley, D. (1970); Kinhill Cameron McNamara. (1996); Lavery, H.J. & Johnson, P.M. (1974). See Queensland Reference List

Compiler & date: Perry, T. W., 2001. Edited Deacon, G., and Miller, G.J., 2004.

## Drainage:

AWRC Division: North-East Coast AWRC Region: BURDEKIN AWRC Basin: HAUGHTON RIVER Catchment: Barratta Creek Sub-catchment:

# Appendix D: Protected Plants Trigger Map

## 07/07/2021 10:50:29



# Protected plants flora survey trigger map

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

Please see the Department of Environment and Science webpage on the <u>clearing of protected plants</u> 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 <u>Queensland Spatial Catalogue</u>, 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 <u>clearing of protected plants</u> for more information.



Appendix E: Matters of State Environmental Significance Environmental Report



Department of Environment and Science

**Environmental Reports** 

# Matters of State Environmental Significance

For the selected area of interest

# **Environmental Reports - General Information**

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

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

Figures in tables may be affected by rounding.

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

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

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

# 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**

Assessment Area Details
Matters of State Environmental Significance (MSES)
MSES Categories
MSES Values Present
Additional Information with Respect to MSES Values Present
MSES - State Conservation Areas
MSES - Wetlands and Waterways
MSES - Species
MSES - Regulated Vegetation
Map 1 - MSES - State Conservation Areas
Map 2 - MSES - Wetlands and Waterways
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals
Map 3b - MSES - Species - Koala habitat area (SEQ)
Map 4 - MSES - Regulated Vegetation
Map 5 - MSES - Offset Areas
Appendices
Appendix 1 - Matters of State Environmental Significance (MSES) methodology
Appendix 2 - Source Data
Appendix 3 - Acronyms and Abbreviations

# **Assessment Area Details**

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

# Table 1: Summary table, details for AOI

Size (ha)	167.42
Local Government(s)	Burdekin Shire
Bioregion(s)	Brigalow Belt
Subregion(s)	Townsville Plains
Catchment(s)	Burdekin, Haughton



# Matters of State Environmental Significance (MSES)

# **MSES** Categories

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

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

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

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the Nature Conservation Act 1992;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004*;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the Vegetation Management Act 1999 that is:

• Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

• Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

Category R areas on the regulated vegetation management map;

• Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

• Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the Regional Planning Interests Act 2014;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

# **MSES Values Present**

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

# Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0.0 ha	0.0 %
1b Protected Areas- nature refuges	0.0 ha	0.0 %
1c Protected Areas- special wildlife reserves	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	0.0 ha	0.0 %
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	0.0 ha	0.0 %
6a High Ecological Value (HEV) wetlands	0.0 ha	0.0 %
6b High Ecological Value (HEV) waterways **	0.0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	13.55 ha	8.1%
7b Special least concern animals	0.0 ha	0.0 %
7c i Koala habitat area - core (SEQ)	0.0 ha	0.0 %
7c ii Koala habitat area - locally refined (SEQ)	0.0 ha	0.0 %
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	5.51 ha	3.3%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	1.04 ha	0.6%
8d Regulated Vegetation - Essential habitat	13.55 ha	8.1%
8e Regulated Vegetation - intersecting a watercourse **	1.5 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	1.15 ha	0.7%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

# Additional Information with Respect to MSES Values Present

# **MSES - State Conservation Areas**

## 1a. Protected Areas - estates

(no results)

# 1b. Protected Areas - nature refuges

(no results)

# 1c. Protected Areas - special wildlife reserves

(no results)

# 2. State Marine Parks - highly protected zones

(no results)

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

(no results)

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

## **MSES - Wetlands and Waterways**

## 4. Strategic Environmental Areas (SEA)

(no results)

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

(no results)

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

(no results)

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

(no results)

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

# **MSES - Species**

# 7a. Threatened (endangered or vulnerable) wildlife

Values are present

## 7b. Special least concern animals

Not applicable

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

Not applicable

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

Not applicable

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

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

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

## Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Crocodylus porosus	estuarine crocodile	V		M-B/E

## Special least concern animal species records

(no results)

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

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

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

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

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

## **MSES - Regulated Vegetation**

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

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

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at: <a href="https://environment.ehp.qld.gov.au/regional-ecosystems/">https://environment.ehp.qld.gov.au/regional-ecosystems/</a>

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.4/11.3.25/11.3.13/11.3.2 5b	O-dom	rem_oc

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

Not applicable

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

Regulated vegetation map category	Map number	RVM rule
R	8358	4

## 8d. Regulated Vegetation - Essential habitat

Values are present

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

A vegetation management watercourse is mapped as present

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

Regulated vegetation map category	Map number	RVM rule
В	8358	2

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

## **MSES - Offsets**

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

(no results)

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

(no results)

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

Page 9

# Map 1 - MSES - State Conservation Areas



# Map 2 - MSES - Wetlands and Waterways



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

## Threatened (endangered or vulnerable) wild special least concern animals






## Map 4 - MSES - Regulated Vegetation



### Map 5 - MSES - Offset Areas



## Appendices

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

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

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

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

### Appendix 2 - Source Data

#### The datasets listed below are available on request from:

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

• Matters of State environmental significance

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

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

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

# Appendix 3 - Acronyms and Abbreviations

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

# Appendix F: Wildlife Online Database Search



## Wildlife Online Extract

Search Criteria:	Species List for a Specified Point
	Species: All
	Type: All
	Status: All
	Records: All
	Date: All
	Latitude: -19.8296
	Longitude: 147.1325
	Distance: 30
	Email: rhiannon@natres.com.au
	Date submitted: Thursday 01 Jul 2021 08:45:23
	Date extracted: Thursday 01 Jul 2021 08:50:07

The number of records retrieved = 677

### **Disclaimer**

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

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

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

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
animals	amphibians	Bufonidae	Rhinella marina	cane toad	Y			12
animals	amphibians	Hylidae	Litoria bicolor	northern sedgefrog		С		1
animals	amphibians	Hylidae	Litoria inermis	bumpy rocketfrog		С		2
animals	amphibians	Hylidae	Litoria caerulea	common green treefrog		С		2
animals	amphibians	Hylidae	Litoria latopalmata	broad palmed rocketfrog		С		2
animals	amphibians	Hvlidae	Litoria fallax	eastern sedgefrog		С		1
animals	amphibians	Hvlidae	Litoria rubella	ruddy treefrog		С		4
animals	amphibians	Limnodynastidae	Limnodynastes convexiusculus	marbled frog		С		1
animals	birds	Acanthizidae	Gerygone olivacea	white-throated gerygone		С		17
animals	birds	Acanthizidae	Smicrornis brevirostris	weebill		С		12
animals	birds	Acanthizidae	Gerygone palpebrosa	fairy gerygone		С		3
animals	birds	Accipitridae	Aviceda subcristata	Pacific baza		С		8
animals	birds	Accipitridae	Accipiter fasciatus	brown goshawk		С		7
animals	birds	Accipitridae	Lophoictinia isura	square-tailed kite		С		3
animals	birds	Accipitridae	Pandion cristatus	eastern osprev		SL		1
animals	birds	Accipitridae	Elanus axillaris	black-shouldered kite		Ċ		7
animals	birds	Accipitridae	Circus assimilis	spotted harrier		Ċ		6
animals	birds	Accipitridae	Haliastur indus	brahminy kite		Ċ		3
animals	birds	Accipitridae	Milvus migrans	black kite		Č		64
animals	birds	Accipitridae	Aquila audax	wedge-tailed eagle		Ċ		11
animals	birds	Accipitridae	Haliastur sphenurus	whistling kite		Ċ		47
animals	birds	Accipitridae	Haliaeetus leucogaster	white-bellied sea-eagle		Ċ		19
animals	birds	Accipitridae	Accipiter novaehollandiae	grey goshawk		Ċ		1
animals	birds	Accipitridae	Circus approximans	swamp harrier		С		6
animals	birds	Acrocephalidae	Acrocephalus australis	Australian reed-warbler		С		7
animals	birds	Aegothelidae	Aegotheles cristatus	Australian owlet-nightjar		С		1
animals	birds	Alcedinidae	Ceyx azureus	azure kingfisher		С		4
animals	birds	Alcedinidae	Cevx pusillus	little kingfisher		С		1
animals	birds	Anatidae	Nettapus coromandelianus	cotton pygmy-goose		С		12
animals	birds	Anatidae	Cygnus atratus	black swan		С		19
animals	birds	Anatidae	Dendrocygna arcuata	wandering whistling-duck		С		18
animals	birds	Anatidae	Dendrocygna eytoni	plumed whistling-duck		С		17/3
animals	birds	Anatidae	Chenonetta jubata	Australian wood duck		С		6
animals	birds	Anatidae	Anas gracilis	grey teal		С		9
animals	birds	Anatidae	Anas superciliosa	Pacific black duck		С		39
animals	birds	Anatidae	Aythya australis	hardhead		С		18
animals	birds	Anatidae	Nettapus pulchellus	green pygmy-goose		С		11
animals	birds	Anhingidae	Anhinga novaehollandiae	Australasian darter		С		46
animals	birds	Anseranatidae	Anseranas semipalmata	magpie goose		С		44
animals	birds	Apodidae	Aerodramus terraereginae	Australian swiftlet		С		2
animals	birds	Apodidae	Hirundapus caudacutus	white-throated needletail		V	V	1
animals	birds	Apodidae	Apus pacificus	fork-tailed swift		SL		2
animals	birds	Ardeidae	Bubulcus ibis	cattle egret		С		10
animals	birds	Ardeidae	Ardea pacifica	white-necked heron		С		15
animals	birds	Ardeidae	Egretta picata	pied heron		С		1
animals	birds	Ardeidae	Ardea sumatrana	great-billed heron		С		2

Kingdom	Class	Family	Scientific Name	Common Name	Ι	Q	А	Records
animals	birds	Ardeidae	Ardea intermedia	intermediate egret		С		25
animals	birds	Ardeidae	Egretta novaehollandiae	white-faced heron		С		28
animals	birds	Ardeidae	Nvcticorax caledonicus	nankeen night-heron		С		8
animals	birds	Ardeidae	Ixobrychus flavicollis	black bittern		C		4
animals	birds	Ardeidae	Egretta garzetta	little earet		Ċ		10
animals	birds	Ardeidae	Ixobrychus dubius	Australian little bittern		Č		1
animals	birds	Ardeidae	Ardea alba modesta	eastern great egret		č		37
animals	birds	Artamidae	Artamus superciliosus	white-browed woodswallow		Č		2
animals	birds	Artamidae	Artamus leucorvnchus	white-breasted woodswallow		Č		50
animals	birds	Artamidae	Cracticus torquatus	grev butcherbird		č		5
animals	birds	Artamidae	Strepera graculina	pied currawong		č		13
animals	birds	Artamidae	Cracticus nigrogularis	pied butcherbird		Č		44
animals	birds	Artamidae	Artamus personatus	masked woodswallow		č		1
animals	birds	Artamidae	Artamus cinereus	black-faced woodswallow		č		15
animals	birds	Artamidae	Artamus minor	little woodswallow		č		1
animals	birds	Artamidae	Gymnorhina tibicen	Australian magnie		č		58
animals	birds	Burbinidae	Burhinus grallarius	hush stone-curlew		č		7
animals	birds	Cacatuidae	Cacatua galerita	sulphur-crested cockatoo		č		31
animals	birds	Cacatuidae	Nymphicus hollandicus	cockatiel		č		3
animals	birds	Cacatuidae	Folophus roseicapilla	galah		č		4
animals	birds	Cacatuidae	Calvptorhypchus banksii	red-tailed black-cockatoo		č		40
animals	birds	Campenhagidae	Coracina tenuirostris	cicadabird		č		
animals	birds	Campenhagidae	Coracina nanuensis	white-bellied cuckoo-shrike		č		71
animals	birds	Campenhagidae	Lalage leucomela	varied triller		č		6
animals	hirds	Campenhagidae	Lalage reconneia	white-winged triller		č		27
animals	birds	Campenhagidae	Coracina maxima	around cuckoo-sbrike		č		1
animals	birds	Campenhagidae	Coracina novaehollandiae	black-faced cuckoo-shrike		č		10
animals	birds	Caprimulgidae	Continuidus macrurus	large-tailed nightiar		č		
animals	birds	Casuariidae	Dromaius novaehollandiae	ange talled highlight		č		1
animals	birds	Charadriidae	Vanallus milas	masked lanwing		č		36
animals	birds	Charadriidae	Elsevornis melanons	black-fronted dotterel		č		5
animals	birds	Charadriidae	Charadrius ruficanillus	red-capped ployer		č		1
animals	birds	Ciconiidae	Enhippiorbynchus asiaticus	black-packed stork		č		1/
animals	birds	Cisticolidae	Cisticola evilis	adden-beaded cisticala		č		14
animals	birds	Cisticolidae	Cisticola iuncidis lavervi	zitting cisticola		č		2
animals	birds	Columbidae	Geophans scripta scripta	squatter nigeon (southern subspecies)		v	V	2
animals	birds	Columbidae	Lopholaimus antarcticus	topknot pigeon		č	v	2
animals	birds	Columbidae	Streptopelia chipensis	spotted dove	V	U		
animals	birds	Columbidae	Macropygia amboinensis	brown cuckoo-dove		C		2
animals	birds	Columbidae	Geopelia humeralis	bar-shouldered dove		č		23
animals	birds	Columbidae	Columba livia	rock dove	V	U		5
animals	birds	Columbidae	Ducula hicolor	nied imperial-nigeon		C		2
animale	hirds	Columbidae	Geonelia cuneata	diamond dove		č		2 Q
animals	birde	Columbidae	Goonalia striata			č		ں وو
animals	birde	Columbidae	Geophans scrinta	squatter nigeon		č		00 11
animals	birds	Columbidae	Ocyphaps scripta Ocyphaps lophotes	crested pigeon		č		40

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
animals	birds	Columbidae	Phaps chalcoptera	common bronzewing		С		1
animals	birds	Coraciidae	Eurystomus orientalis	dollarbird		С		21
animals	birds	Corcoracidae	Struthidea cinerea	apostlebird		С		17
animals	birds	Corcoracidae	Corcorax melanorhamphos	white-winged chough		С		5
animals	birds	Corvidae	, Corvus orru	Torresian crow		С		30
animals	birds	Corvidae	Corvus coronoides	Australian raven		С		29
animals	birds	Cuculidae	Scythrops novaehollandiae	channel-billed cuckoo		С		14
animals	birds	Cuculidae	Chalcites minutillus russatus	Gould's bronze-cuckoo		С		4
animals	birds	Cuculidae	Chalcites basalis	Horsfield's bronze-cuckoo		С		11
animals	birds	Cuculidae	Chalcites lucidus	shining bronze-cuckoo		С		2
animals	birds	Cuculidae	Cacomantis pallidus	pallid cuckoo		С		20
animals	birds	Cuculidae	Chalcites minutillus	little bronze-cuckoo		С		11
animals	birds	Cuculidae	Eudvnamvs orientalis	eastern koel		Ċ		12
animals	birds	Cuculidae	Cacomantis variolosus	brush cuckoo		Ċ		34/1
animals	birds	Cuculidae	Centropus phasianinus	pheasant coucal		Ċ		45
animals	birds	Cuculidae	Cacomantis flabelliformis	fan-tailed cuckoo		Č		6
animals	birds	Dicruridae	Dicrurus bracteatus	spangled drongo		Č		45
animals	birds	Estrildidae	Lonchura punctulata	nutmeg mannikin	Y	-		9
animals	birds	Estrildidae	Neochmia modesta	plum-headed finch	•	С		12
animals	birds	Estrildidae	Neochmia phaeton	crimson finch		č		10
animals	birds	Estrildidae	l onchura castaneothorax	chestnut-breasted mannikin		Č		341
animals	birds	Estrildidae	Neochmia temporalis	red-browed finch		č		13
animals	birds	Estrildidae	Taeniopygia guttata	zebra finch		č		7
animals	birds	Estrildidae	Poephila cincta cincta	black-throated finch (white-rumped subspecies)		Ē	Е	15
animals	birds	Estrildidae	Taeniopygia bichenovii	double-barred finch		С		63
animals	birds	Eurostopodidae	Eurostopodus argus	spotted nightiar		Č		1
animals	birds	Falconidae	Falco berigora	brown falcon		Č		14
animals	birds	Falconidae	Falco longipennis	Australian hobby		Č		7
animals	birds	Falconidae	Falco subniger	black falcon		č		1
animals	birds	Falconidae	Falco peregrinus	peregrine falcon		č		5
animals	birds	Falconidae	Falco cenchroides	nankeen kestrel		Č		11
animals	birds	Gruidae	Antigone rubicunda	brolga		Č		13
animals	birds	Halcvonidae	Dacelo leachii	blue-winged kookaburra		Č		60
animals	birds	Halcvonidae	Todiramphus sanctus	sacred kingfisher		Č		32
animals	birds	Halcvonidae	Todiramphus macleavii	forest kingfisher		č		60
animals	birds	Halcvonidae	Todiramphus pyrrhopygius	red-backed kingfisher		č		3
animals	birds	Halcvonidae	Dacelo novaequineae	laughing kookaburra		Č		34
animals	birds	Hirundinidae	Petrochelidon ariel	fairy martin		č		22
animals	birds	Hirundinidae	Hirundo neoxena	welcome swallow		č		14
animals	birds	Hirundinidae	Petrochelidon nigricans	tree martin		Č		23
animals	birds	Jacanidae	Irediparra gallinacea	comb-crested jacana		č		27
animals	birds	Laridae	Gelochelidon nilotica	aull-billed tern		SL		2
animals	birds	Laridae	Hydroprogne caspia	Caspian tern		SI		- 5
animals	birds	Laridae	Chlidonias hybrida	whiskered tern		C_		2
animals	birds	Maluridae	Malurus melanocephalus	red-backed fairy-wren		Č		76

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
animals	birds	Megaluridae	Cincloramphus mathewsi	rufous songlark		С		21
animals	birds	Megaluridae	Megalurus timoriensis	tawny grassbird		С		22
animals	birds	Megapodiidae	Alectura lathami	Australian brush-turkey		С		6
animals	birds	Meliphagidae	Meliphaga notata	yellow-spotted honeyeater		С		3
animals	birds	Meliphagidae	Myzomela obscura	dusky honeyeater		С		5
animals	birds	Meliphagidae	Stomiopera flava	vellow honeveater		С		92
animals	birds	Meliphagidae	Meliphaga lewinii	Lewin's honeyeater		С		5
animals	birds	Meliphagidae	Caligavis chrysops	vellow-faced honeveater		С		1
animals	birds	Meliphagidae	Entomyzon cvanotis	blue-faced honeyeater		С		53/1
animals	birds	Meliphagidae	Manorina flavigula	vellow-throated miner		С		25
animals	birds	Meliphagidae	Epthianura tricolor	crimson chat		С		1
animals	birds	Meliphagidae	, Gavicalis virescens	singing honeyeater		С		1
animals	birds	Meliphagidae	Philemon buceroides	helmeted friarbird		С		7
animals	birds	Meliphagidae	Stomiopera unicolor	white-gaped honeyeater		С		6
animals	birds	Meliphagidae	Lichmera indistincta	brown honeveater		С		48
animals	birds	Meliphagidae	Melithreptus gularis	black-chinned honeveater		C		10
animals	birds	Meliphagidae	Ramsavornis modestus	brown-backed honeveater		C		21
animals	birds	Meliphagidae	Philemon corniculatus	noisv friarbird		Ċ		23
animals	birds	Meliphagidae	Ramsavornis fasciatus	bar-breasted honeveater		Č		3
animals	birds	Meliphagidae	Manorina melanocephala	noisv miner		Č		5
animals	birds	Meliphagidae	Mvzomela sanguinolenta	scarlet honeveater		Ċ		5
animals	birds	Meliphagidae	Philemon citreogularis	little friarbird		Č		60
animals	birds	Meliphagidae	Conopophila rufoqularis	rufous-throated honeveater		Č		14
animals	birds	Meliphagidae	Melithreptus albogularis	white-throated honeveater		C		55
animals	birds	Meropidae	Merops ornatus	rainbow bee-eater		C		66
animals	birds	Monarchidae	Symposiachrus trivirgatus	spectacled monarch		SL		3
animals	birds	Monarchidae	Myiagra inquieta	restless flycatcher		С		12
animals	birds	Monarchidae	Myiagra rubecula	leaden flycatcher		С		64
animals	birds	Monarchidae	Myiagra cyanoleuca	satin flycatcher		SL		1
animals	birds	Monarchidae	Grallina cvanoleuca	magpie-lark		С		81
animals	birds	Monarchidae	Monarcha melanopsis	black-faced monarch		SL		3
animals	birds	Motacillidae	Anthus novaeseelandiae	Australasian pipit		С		5
animals	birds	Nectariniidae	Dicaeum hirundinaceum	mistletoebird		С		18
animals	birds	Nectariniidae	Cinnyris jugularis	olive-backed sunbird		С		32
animals	birds	Oriolidae	Sphecotheres vieilloti	Australasian figbird		С		25
animals	birds	Oriolidae	Oriolus sagittatus	olive-backed oriole		С		24
animals	birds	Otididae	Ardeotis australis	Australian bustard		С		9
animals	birds	Pachycephalidae	Pachycephala rufiventris	rufous whistler		С		89
animals	birds	Pachycephalidae	Pachycephala pectoralis	golden whistler		С		1
animals	birds	Pachycephalidae	Colluricincla megarhyncha	little shrike-thrush		С		12
animals	birds	Pardalotidae	Pardalotus striatus	striated pardalote		С		50
animals	birds	Passeridae	Passer domesticus	house sparrow	Y			6
animals	birds	Pelecanidae	Pelecanus conspicillatus	Australian pelican		С		18
animals	birds	Petroicidae	Poecilodryas superciliosa	white-browed robin		С		1
animals	birds	Petroicidae	Microeca flavigaster	lemon-bellied flycatcher		Ċ		49
animals	birds	Petroicidae	Microeca fascinans	jacky winter		С		10

Kingdom	Class	Family	Scientific Name	Common Name	Q	А	Records
animals	birds	Petroicidae	Petroica goodenovii	red-capped robin	С		2
animals	birds	Petroicidae	Melanodryas cucullata	hooded robin	Ċ		1
animals	birds	Phalacrocoracidae	Phalacrocorax carbo	great cormorant	С		13
animals	birds	Phalacrocoracidae	Phalacrocorax varius	pied cormorant	Ċ		4
animals	birds	Phalacrocoracidae	Microcarbo melanoleucos	little pied cormorant	Ċ		36
animals	birds	Phalacrocoracidae	Phalacrocorax sulcirostris	little black cormorant	Ċ		32
animals	birds	Phasianidae	Coturnix vpsilophora	brown quail	Ċ		12
animals	birds	Pittidae	Pitta versicolor	noisv pitta	Ċ		1
animals	birds	Podargidae	Podargus strigoides	tawny frogmouth	Ċ		5
animals	birds	Podicipedidae	Tachvbaptus novaehollandiae	Australasian grebe	Ċ		20
animals	birds	Podicipedidae	Podiceps cristatus	great crested grebe	Ċ		8
animals	birds	Pomatostomidae	Pomatostomus temporalis	grev-crowned babbler	Ċ		7
animals	birds	Psittacidae	Trichoalossus chlorolepidotus	scaly-breasted lorikeet	Č		25
animals	birds	Psittacidae	Aprosmictus ervthropterus	red-winged parrot	Ċ		26
animals	birds	Psittacidae	Trichoglossus moluccanus	rainbow lorikeet	Č		44
animals	birds	Psittacidae	Platycercus adscitus	pale-headed rosella	č		58
animals	birds	Psittacidae	Melopsittacus undulatus	budgerigar	Č		2
animals	birds	Ptilonorhynchidae	Ptilonorhynchus maculatus	spotted bowerbird	Č		- 1
animals	birds	Ptilonorhynchidae	Ptilonorhynchus nuchalis	great bowerbird	č		29
animals	birds	Rallidae	Gallinula tenebrosa	dusky moorhen	č		5
animals	birds	Rallidae	Porphyrio melanotus	purple swamphen	Č		2
animals	birds	Rallidae	Amaurornis moluccana	pale-vented bush-hen	č		7
animals	birds	Rallidae	Gallirallus philippensis	buff-banded rail	č		6
animals	birds	Rallidae	Fulica atra	Eurasian coot	Č		5
animals	birds	Rallidae	Porzana pusilla	Baillon's crake	č		1
animals	birds	Rallidae	Porzana fluminea	Australian spotted crake	Č		1
animals	birds	Rallidae	Porzana tabuensis	spotless crake	č		1
animals	birds	Rallidae	Amaurornis cinerea	white-browed crake	č		3
animals	birds	Recurvirostridae	Recurvirostra novaehollandiae	red-necked avocet	Č		1
animals	birds	Recurvirostridae	Himantopus himantopus	black-winged stilt	č		4
animals	birds	Rhipiduridae	Rhipidura leucophrys	willie wagtail	č		76
animals	birds	Rhipiduridae	Rhipidura rufiventris	northern fantail	Č		1
animals	birds	Rhipiduridae	Rhipidura rufifrons	rufous fantail	ŠL		2
animals	birds	Rhipiduridae	Rhipidura albiscapa	grev fantail	Č		71
animals	birds	Scolopacidae	Gallinago hardwickii	Latham's snipe	SL		1
animals	birds	Strigidae	Ninox boobook	southern boobook	Č		1
animals	birds	Strigidae	Ninox rufa queenslandica	rufous owl (southern subspecies)	Ċ		1
animals	birds	Strigidae	Ninox connivens	barking owl	Ċ		8
animals	birds	Sturnidae	Aplonis metallica	metallic starling	Č		1
animals	birds	Threskiornithidae	Threskiornis molucca	Australian white ibis	Č		35
animals	birds	Threskiornithidae	Threskiornis spinicollis	straw-necked ibis	Ċ		40
animals	birds	Threskiornithidae	Platalea regia	roval spoonbill	Č		18
animals	birds	Threskiornithidae	Platalea flavipes	vellow-billed spoonbill	Č		18
animals	birds	Threskiornithidae	Plegadis falcinellus	alossy ibis	SL		5
animals	birds	Timaliidae	Zosterops lateralis	silvereve	Č		2
animals	birds	Turnicidae	Turnix varius	painted button-guail	Ċ		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
animals	birds	Turnicidae	Turnix pyrrhothorax	red-chested button-quail		С		2
animals	birds	Turnicidae	Turnix maculosus	red-backed button-quail		С		4
animals	birds	Tytonidae	Tyto delicatula	eastern barn owl		С		2
animals	mammals	Cervidae	Áxis axis	chital	Y			1
animals	mammals	Dasyuridae	Dasyurus hallucatus	northern quoll		С	Е	3
animals	mammals	Leporidae	Lepus europaeus	European brown hare	Y			1
animals	mammals	Macropodidae	Notamacropus agilis	agile wallaby		С		2
animals	mammals	Macropodidae	Petrogale assimilis	allied rock-wallaby		С		5/5
animals	mammals	Macropodidae	Osphranter robustus	common wallaroo		С		1
animals	mammals	Macropodidae	Petrogale inornata	unadorned rock-wallaby		С		3/3
animals	mammals	Macropodidae	Macropus giganteus	eastern grey kangaroo		С		3
animals	mammals	Miniopteridae	Miniopterus schreibersii oceanensis	eastern bent-wing bat		С		1
animals	mammals	Miniopteridae	Miniopterus australis	little bent-wing bat		С		1
animals	mammals	Peramelidae	Isoodon macrourus	northern brown bandicoot		С		2/2
animals	mammals	Phascolarctidae	Phascolarctos cinereus	koala		V	V	1
animals	mammals	Pteropodidae	Pteropus alecto	black flying-fox		С		2/1
animals	mammals	Pteropodidae	Pteropus scapulatus	little red flving-fox		Ċ		1
animals	mammals	Suidae	Sus scrofa	pig	Y	-		6
animals	mammals	Vespertilionidae	Mvotis macropus	large-footed myotis	-	С		1
animals	rav-finned fishes	Ambassidae	Ambassis species	northwest glassfish		-		2
animals	rav-finned fishes	Ambassidae	Ambassis agassizii	Agassiz's glassfish				1
animals	ray-finned fishes	Ambassidae	Ambassis agrammus	sailfin glassfish				11
animals	rav-finned fishes	Anguillidae	Anguilla reinhardtii	longfin eel				40
animals	rav-finned fishes	Apogonidae	Glossamia aprion	mouth almighty				45
animals	ray-finned fishes	Ariidae	Neoarius graeffei	blue catfish				7
animals	rav-finned fishes	Atherinidae	Craterocephalus stercusmuscarum	flyspecked hardyhead				400
animals	ray-finned fishes	Belonidae	Strongylura krefftii	freshwater longtom				47
animals	ray-finned fishes	Centropomidae	Lates calcarifer	barramundi				188
animals	ray-finned fishes	Cichlidae	Oreochromis mossambica	Mozambique mouthbrooder	Y			4
animals	ray-finned fishes	Clupeidae	Nematalosa erebi	bony bream				518
animals	ray-finned fishes	Eleotridae	Oxveleotris lineolata	sleepy cod				218
animals	ray-finned fishes	Eleotridae	Hypseleotris compressa	empire audaeon				67
animals	ray-finned fishes	Gobiidae	Awaous acritosus	roman-nose goby				1
animals	ray-finned fishes	Hemiramphidae	Arrhamphus sclerolepis	snubnose garfish				7
animals	rav-finned fishes	Megalopidae	Megalops cyprinoides	oxeve herring				36
animals	ray-finned fishes	Melanotaeniidae	Melanotaenia splendida splendida	eastern rainbowfish				84
animals	ray-finned fishes	Muqilidae	Mugil cephalus	sea mullet				1
animals	ray-finned fishes	Osteoglossidae	Scleropages jardinij	northern saratoga				1
animals	ray-finned fishes	Plotosidae	Neosilurus ater	black catfish				35
animals	ray-finned fishes	Plotosidae	Neosilurus hvrtlii	Hvrtl's catfish				1
animals	ray-finned fishes	Poeciliidae	Gambusia holbrooki	mosquitofish	Y			1
animals	rav-finned fishes	Scatophagidae	Scatophagus argus	spotted scat	•			2
animals	ray-finned fishes	Terapontidae	Scortum parviceps	smallhead grunter				3
animals	ray-finned fishes	Terapontidae	Leiopotherapon unicolor	spangled perch				6
animals	ray-finned fishes	Terapontidae	Hephaestus fuliainosus	sooty grunter				22
animals	ray-finned fishes	Terapontidae	Amniataba percoides	barred grunter				36
		. 5142 01110400						00

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
animals	rav-finned fishes	Toxotidae	Toxotes chatareus	sevenspot archerfish				20
animals	reptiles	Agamidae	Diporiphora australis	tommy roundhead		С		2/1
animals	reptiles	Boidae	Antaresia maculosa	spotted python		Č		1/1
animals	reptiles	Carphodactylidae	Nephrurus asper	spiny knob-tailed gecko		č		1
animals	reptiles	Chelidae	Emvdura macquarii krefftii	Krefft's river turtle		č		1
animals	reptiles	Chelidae	Elseva irwini	Irwin's turtle		Č		1
animals	rentiles	Chelidae	Chelodina canni	Cann's longneck turtle		č		1
animale	roptilos	Colubridae	Tropidonophis mairii	freshwater snake		č		1
animale	roptilos	Colubridae	Nendrelanhis nunctulatus	areen tree snake		č		2
animals	reptiles	Elanidae	Vermicelle annulata	bandy-bandy		č		<u>ح</u> 1/1
animals	reptiles	Elapidae	Antaiosarnans albicans	porth-postern plain-posed		č		1/1
anniais	repules	Elapidae	Antaioserpens auxceps	burrowing snake		C		1/ 1
animals	reptiles	Elapidae	Furina diadema	red-naped snake		С		1
animals	reptiles	Elapidae	Demansia torquata	collared whipsnake		С		1
animals	reptiles	Gekkonidae	Gehyra dubia	dubious dtella		С		1/1
animals	reptiles	Gekkonidae	Heteronotia binoei	Bynoe's gecko		С		3
animals	reptiles	Pygopodidae	Lialis burtonis	Burton's legless lizard		С		2/2
animals	reptiles	Pygopodidae	Delma tincta	excitable delma		С		1/1
animals	reptiles	Scincidae	Cryptoblepharus pulcher pulcher	elegant snake-eyed skink		С		1
animals	reptiles	Scincidae	Morethia taeniopleura	fire-tailed skink		С		1
animals	reptiles	Scincidae	Pvamaeascincus timlowi	dwarf litter-skink		С		1
animals	reptiles	Scincidae	Glaphyromorphus punctulatus	fine-spotted mulch-skink		C		4/4
animals	reptiles	Scincidae	Lampropholis delicata	dark-flecked garden sunskink		C		3/3
animals	reptiles	Scincidae	Carlia rubigo	orange-flanked rainbow skink		Ċ		2
animals	reptiles	Scincidae	Carlia iarnoldae	lined rainbow-skink		Ċ		1
animals	reptiles	Scincidae	Carlia schmeltzii	robust rainbow-skink		Ċ		1
animals	reptiles	Scincidae	Ctenotus spaldingi	straight-browed ctenotus		Č		1
animals	reptiles	Scincidae	Cryptoblepharus sp.			č		1
animals	reptiles	Typhlopidae	Anilios affinis	small-headed blind snake		č		1
animals	reptiles	Varanidae	Varanus storri	Storr's monitor		č		2
plants	land plants	Acanthaceae	Ruellia tuberosa		Y	•		1/1
plants	land plants	Acanthaceae	Nelsonia campestris			С		1/1
plants	land plants	Acanthaceae	Thunbergia fragrans		Y	•		4/4
plants	land plants	Acanthaceae	Thunbergia grandiflora	sky flower	Ý			1/1
plants	land plants	Acanthaceae	Hvarophila angustifolia		•	C		1/1
plants	land plants	Acanthaceae	Asystasia gangetica subsp. gangetica		Y	U		1/1
plants	land plants	Acanthaceae	Hypoestes floribunda var floribunda		•	C		1/1
plants	land plants	Acanthaceae	Rostellularia adscendens subsp. adscendens			Č		1/1
plants	land plants	Alismataceae	Caldesia oligococca			č		1/1
nlante	land plants	Amaranthaceae	Alternanthera nodiflora	iovweed		č		1/1
plants	land plants	Amaranthaceae	Alternanthera nana	bainy joyweed		č		1/1
plants	land plants	Amaranthaceae	Guillemines dense	small matwood	$\sim$	U		1/1
plants	land plants	Amaranthaceae	Alternanthera ficcidea	Sman malweeu				1/1 の/つ
plants	land plants	Amaranthaceae	Amoronthus spinosus	noodlo burr	I V			2/2
plants	land plants		Amarantinus spinosus Dooringia amaranthoidea	reduction built	I	C		Z/ Z 2/ 2
plants	land plants	Amaranthaceae	Alternanthera angustifolia	reuberry		č		3/3 1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
plants	land plants	Amaranthaceae	Alternanthera denticulata var. micrantha			С		4/4
plants	land plants	Anacardiaceae	Pleiogynium timorense	Burdekin plum		С		1/1
, plants	land plants	Apocynaceae	Wrightia saligna	·		С		1/1
plants	land plants	Apocynaceae	Alyxia spicata			С		1/1
plants	land plants	Apocynaceae	Catharanthus roseus	pink periwinkle	Y			1/1
, plants	land plants	Apocynaceae	Parsonsia lanceolata	northern silkpod		С		1/1
plants	land plants	Apocynaceae	Vincetoxicum erectum	·		С		5/5
, plants	land plants	Apocynaceae	Cryptostegia grandiflora	rubber vine	Y			8/2
, plants	land plants	Araceae	Lemna aequinoctialis	common duckweed		С		1/1
, plants	land plants	Asteraceae	Xerochrysum bracteatum	golden everlasting daisy		С		1/1
plants	land plants	Asteraceae	Coronidium lanuginosum	6 6 7		С		1/1
, plants	land plants	Asteraceae	Cyanthillium cinereum			С		1/1
, plants	land plants	Asteraceae	Xanthium occidentale		Y			1/1
, plants	land plants	Asteraceae	Synedrella nodiflora		Y			1/1
, plants	land plants	Asteraceae	Sphaeranthus indicus			С		1/1
, plants	land plants	Asteraceae	Centipeda borealis			С		2/2
, plants	land plants	Asteraceae	Peripleura scabra			С		2/2
, plants	land plants	Asteraceae	Eclipta prostrata	white eclipta	Y			3/3
, plants	land plants	Asteraceae	Camptacra barbata	·		С		1/1
, plants	land plants	Asteraceae	Blumea saxatilis			С		1/1
plants	land plants	Asteraceae	Xerochrysum bracteatum subsp. (Mount Elliot A.R.Bean 3593)			С		1/1
plants	land plants	Asteraceae	Pterocaulon serrulatum var. serrulatum			С		2/2
, plants	land plants	Asteraceae	Acmella grandiflora var. brachyglossa			С		1/1
, plants	land plants	Asteraceae	Gynura drymophila var. drymophila			С		1/1
, plants	land plants	Asteraceae	Pseudognaphalium luteoalbum	Jersey cudweed		С		1/1
, plants	land plants	Asteraceae	Acanthospermum hispidum	star burr	Y			1/1
, plants	land plants	Asteraceae	Parthenium hysterophorus	parthenium weed	Y			1/1
, plants	land plants	Asteraceae	Chrysocephalum apiculatum	vellow buttons		С		2/2
, plants	land plants	Bignoniaceae	Pandorea pandorana	wonga vine		С		1/1
, plants	land plants	Bignoniaceae	Dolichandrone alternifolia	C C		С		1/1
, plants	land plants	Bombacaceae	Lagunaria gueenslandica			С		2/2
, plants	land plants	Boraginaceae	Cordia dichotoma			С		1/1
, plants	land plants	Boraginaceae	Ehretia grahamii			С		1/1
, plants	land plants	Boraginaceae	Heliotropium ovalifolium			С		2/2
plants	land plants	Boraginaceae	Ehretia membranifolia	weeping koda		Ċ		1/1
, plants	land plants	Byttneriaceae	Hannafordia shanesii	1 3		С		1/1
, plants	land plants	Byttneriaceae	Melochia corchorifolia			С		1/1
plants	land plants	Caesalpiniaceae	Parkinsonia aculeata	parkinsonia	Y			2/2
plants	land plants	Caesalpiniaceae	Senna gaudichaudii			С		1/1
, plants	land plants	Caesalpiniaceae	Lvsiphvllum hookeri	Queensland ebony		С		1/1
plants	land plants	Caesalpiniaceae	Chamaecrista absus var. absus	· · · · · · · · · · · ·		Ċ		2/2
plants	land plants	Campanulaceae	Wahlenbergia caryophylloides			Ċ		1/1
plants	land plants	Campanulaceae	Lobelia quadrangularis			Ċ		1/1
plants	land plants	Capparaceae	Capparis canescens			Č		1/1
, plants	land plants	Caryophyllaceae	Polycarpaea spirostylis subsp. spirostylis			С		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	А	Records
plants	land plants	Casuarinaceae	Casuarina cunninghamiana subsp. cunninghamiana			С		1/1
plants	land plants	Celastraceae	Denhamia oleaster			С		1/1
, plants	land plants	Celastraceae	Elaeodendron melanocarpum			С		1/1
plants	land plants	Celastraceae	Denhamia cunninghamii			С		2/2
, plants	land plants	Chenopodiaceae	Chenopodium album	fat-hen	Y			2/2
, plants	land plants	Chenopodiaceae	Dysphania glomulifera subsp. glomulifera			С		1/1
, plants	land plants	Cleomaceae	Tarenaya aculeata		Y			1/1
, plants	land plants	Cleomaceae	Arivela viscosa			С		1/1
, plants	land plants	Clusiaceae	Hypericum gramineum			С		1/1
, plants	land plants	Cochlospermaceae	Cochlospermum gillivraei			С		2/2
, plants	land plants	Combretaceae	Terminalia sericocarpa	damson		С		1/1
, plants	land plants	Convolvulaceae	Distimake guinguefolius		Y			2/2
plants	land plants	Convolvulaceae	Xenostegia tridentata			С		1/1
plants	land plants	Convolvulaceae	Evolvulus nummularius		Y	-		1/1
plants	land plants	Convolvulaceae	Operculina turpethum			С		1/1
plants	land plants	Convolvulaceae	Ipomoea abrupta			Č		1/1
plants	land plants	Convolvulaceae	Ipomoea eriocarpa			č		1/1
plants	land plants	Convolvulaceae	Ipomoea aquatica			Č		2/2
plants	land plants	Convolvulaceae	Argyreia nervosa		Y	Ŭ		$\frac{-}{2}$
plants	land plants	Convolvulaceae	Jacquemontia paniculata		•	С		1/1
plants	land plants	Convolvulaceae	Inomoea funicularis			č		1/1
plants	land plants	Cornaceae	Alangium polyosmoides subsp. tomentosum			č		1/1
plants	land plants	Cucurbitaceae	l uffa aegyptiaca			č		1/1
plants	land plants	Cucurbitaceae	Diplocyclos palmatus subsp. affinis			č		1/1
plants	land plants	Cucurbitaceae	Cucumis anguria var anguria	West Indian gherkin	Y	Ŭ		1/1
plants	land plants	Cyperaceae	Scleria sphacelata	front indian grionan	•	С		2/2
plants	land plants	Cyperaceae	Cyperus perangustus			č		1/1
plants	land plants	Cyperaceae	Cyperus platystylis			č		1/1
plants	land plants	Cyperaceae	Eleocharis geniculata			č		1/1
plants	land plants	Cyperaceae	Fimbristylis dichotoma	common fringe-rush		č		1/1
plants	land plants	Cyperaceae	Fimbristylis hisumbellata	common minge rush		č		1/1
plants	land plants	Cyperaceae	Fimbristylis sieberiana			č		1/1
plants	land plants	Cyperaceae	Cyperus procerus			č		1/1
plants	land plants	Cyperaceae	Cyperus hulhosus			č		1/1
plants	land plants	Cyperaceae	Cyperus distans			č		1/1
plants	land plants	Cyperaceae	Gahnia aspera			č		1/1
plants	land plants	Cyperaceae	Cyperus iria			č		1/1
plants	land plants	Cyperaceae	Fimbristylis littoralis			č		1/1
plants	land plants	Cyperaceae	Cyperus pervulosus			č		1/1
plants	land plants	Cyperaceae	Schoenus falcatus			č		1/1
plants	land plants	Cyperaceae	Cyperus concinnus			č		1/1
plants	land plants	Cyperaceae	Cyperus scariosus			č		1/1
plants	land plants	Droseraceae	Drosera finlavsoniana			č		1/1
plants	land plants	Ebenaceae	Diospyros laurina			č		1/1
plants	land plants	Ebenaceae	Diospyros humilis	small-leaved ebony		č		1/1
plants	land plants	Ebenaceae	Diospyros geminata	scaly ebony		č		1/1

Kingdom Class		Family Scientific Name		Common Name		Q	Α	Records
plants	land plants	Euphorbiaceae	Acalypha eremorum	soft acalypha		С		2/2
plants	land plants	Euphorbiaceae	Croton arnhemicus			С		1/1
plants	land plants	Euphorbiaceae	Mallotus philippensis	red kamala		С		2/2
plants	land plants	Euphorbiaceae	Jatropha gossypiifolia	bellyache bush	Y			2/2
plants	land plants	Euphorbiaceae	Claoxylon tenerifolium subsp. tenerifolium			С		1/1
plants	land plants	Euphorbiaceae	Ricinus communis	castor oil bush	Y			5/1
plants	land plants	Euphorbiaceae	Euphorbia bifida			С		1/1
plants	land plants	Euphorbiaceae	Croton					1/1
, plants	land plants	Euphorbiaceae	Croton phebalioides	narrow-leaved croton		С		1/1
plants	land plants	Fabaceae	Glycine					1/1
plants	land plants	Fabaceae	Vigna sp. (Greta Creek R.J.Lawn+ AQ532201)			С		3/3
, plants	land plants	Fabaceae	Tephrosia					1/1
, plants	land plants	Fabaceae	Hovea longipes	brush hovea		С		1/1
plants	land plants	Fabaceae	Mucuna gigantea	burny bean		С		1/1
plants	land plants	Fabaceae	Centrosema molle	,	Y			1/1
plants	land plants	Fabaceae	Cullen badocanum			С		3/3
plants	land plants	Fabaceae	Canavalia papuana	wild jack bean		Ċ		1/1
plants	land plants	Fabaceae	Flemingia lineata	,		Ċ		1/1
plants	land plants	Fabaceae	Millettia pinnata			č		1/1
plants	land plants	Fabaceae	Indigofera trvonii			č		1/1
plants	land plants	Fabaceae	Aeschvnomene indica	budda pea		Č		1/1
plants	land plants	Fabaceae	Aeschynomene villosa		Y	•		1/1
plants	land plants	Fabaceae	Crotalaria goreensis	gambia pea	Ý			1/1
plants	land plants	Fabaceae	Crotalaria verrucosa	gamera pea		С		1/1
plants	land plants	Fabaceae	Desmodium scorpiurus		Y	•		1/1
plants	land plants	Fabaceae	Indigofera linifolia			С		1/1
plants	land plants	Fabaceae	Indigofera pratensis			č		1/1
plants	land plants	Fabaceae	Uraria lagopodioides			č		1/1
plants	land plants	Fabaceae	Alvsicarnus vaginalis		Y	Ũ		1/1
plants	land plants	Fabaceae	Indigofera leucotricha		•	С		1/1
plants	land plants	Fabaceae	Tephrosia macrostachva			č		1/1
plants	land plants	Fabaceae	Alvsicarnus ovalifolius		Y	Ũ		1/1
plants	land plants	Fabaceae	Crotalaria laburnifolia		Ý			1/1
plants	land plants	Fabaceae	Crotalaria guinguefolia			С		1/1
plants	land plants	Fabaceae	Macrontilium lathyroides		Y	Ũ		1/1
plants	land plants	Fabaceae	Alvsicarous buoleurifolius	sweet alvs	Ý			1/1
plants	land plants	Fabaceae	Vigna radiata var sublobata	eweetalye		С		1/1
plants	land plants	Fabaceae	Crotalaria retusa var. retusa		Y	Ŭ		1/1
plants	land plants	Fabaceae	Crotalaria montana var exserta			С		1/1
plants	land plants	Fabaceae	Crotalaria nallida var. obovata		Y	Ŭ		3/3
plants	land plants	Fabaceae	Galactia tenuiflora var Jucida			С		2/2
plants	land plants	Fabaceae	Tenbrosia filines subsp. filines			č		1/1
plants	land plants	Fabaceae	Zornia muriculata subsp. angustata			č		3/3
nlante	land plants	Fahareae	Abrus precatorius subsp. precatorius			č		1/1
nlante	land plants	Fahareae	Tenbrosia brachvodon var Iongifolia			č		2/2
plants	land plants	Fabaceae	Crotalaria aridicola subsp. aridicola			č		1/1
						-		., .

Kingdom Class Far		Family	Scientific Name	Common Name	I	Q	₹ A	Records
plants	land plants	Fabaceae	Zornia muelleriana subsp. muelleriana			С		1/1
plants	land plants	Fabaceae	Aeschynomene americana var. glandulosa		Y			1/1
, plants	land plants	Fabaceae	Crotalaria medicaginea var. medicaginea			С		1/1
, plants	land plants	Fabaceae	Crotalaria mitchellii subsp. mitchellii			С		1/1
, plants	land plants	Fabaceae	Crotalaria sessiliflora var. anthylloides			С		1/1
, plants	land plants	Fabaceae	Vigna sp. (Station Creek R.J.Lawn CQ3284)			С		2/2
, plants	land plants	Fabaceae	Galactia					1/1
, plants	land plants	Goodeniaceae	Goodenia rosulata			С		1/1
, plants	land plants	Goodeniaceae	Goodenia pilosa			С		1/1
, plants	land plants	Haloragaceae	Gonocarpus acanthocarpus			С		1/1
, plants	land plants	Haloragaceae	Myriophyllum verrucosum	water milfoil		С		1/1
, plants	land plants	Helicteraceae	Helicteres semialabra			С		1/1
, plants	land plants	Hemerocallidaceae	Dianella caerulea			С		2/2
plants	land plants	Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia			Ċ		1/1
plants	land plants	Hydrocharitaceae	Hvdrilla verticillata	hvdrilla		Ċ		1/1
plants	land plants	Hydrocharitaceae	Ottelia alismoides			Č		1/1
plants	land plants	Hydrocharitaceae	Hvdrocharis dubia	froabit	Y	•		2/2
plants	land plants	Lamiaceae	Clerodendrum floribundum			С		5/5
plants	land plants	Lamiaceae	Mesosphaerum suaveolens		Y	•		1/1
plants	land plants	Lamiaceae	Coleus scutellarioides			С		1/1
plants	land plants	Lamiaceae	Basilicum polystachyon			Č		2/2
plants	land plants	Lamiaceae	Pitvrodia salviifolia	pitvrodia		č		1/1
plants	land plants	Lamiaceae	Leucas lavandulifolia	phyrodia	Y	Ũ		1/1
plants	land plants	Lamiaceae	Ocimum americanum		Ý			2/2
plants	land plants	Lamiaceae	Teucrium modestum			С		$\frac{-}{2/2}$
plants	land plants	Lamiaceae	Premna dallachvana			č		1/1
plants	land plants	Lamiaceae	l eucas decemdentata			č		1/1
plants	land plants	Lamiaceae	Premna serratifolia			č		1/1
plants	land plants	Lamiaceae	Coleus araveolens			č		1/1
plants	land plants	Lauraceae	Litsea alutinosa			č		2/2
plants	land plants	Lauraceae	Cryptocarva triplinervis var triplinervis			č		2/2
plants	land plants	Laxmanniaceae	l omandra longifolia			č		1/1
plants	land plants	Lentibulariaceae	Utricularia aurea	golden bladderwort		č		1/1
plants	land plants	Lentibulariaceae	l Itricularia stellaris	gelden bladden oft		č		1/1
plants	land plants	Loranthaceae	l vsiana subfalcata			č		1/1
plants	land plants	Lythraceae	Ammannia multiflora	ierry-ierry		č		1/1
plants	land plants	Malvaceae	Abutilon auritum	Chinese lantern		č		1/1
nlants	land plants	Malvaceae	l Irena lohata	urena weed	Y	Ŭ		1/1
plants	land plants	Malvaceae	Sida acuta	spinyhead sida	Ý			1/1
plants	land plants	Malvaceae	Sida hackettiana	opinynoud oldu		С		1/1
nlants	land plants	Malvaceae	Abutilon quineense		Y	Ŭ		1/1
plants	land plants	Malvaceae	Hibiscus panduriformis		1	С		2/2
plants	land plants	Malvaceae	Abutilon micropetalum			č		1/1
nlants	land plants	Malvaceae	Hibiscus krichauffianus			č		1/1
plants	land plants	Malvaceae	Hibiscus vitifolius			č		1/1
plants	land plants	Marsileaceae	Marsilea mutica	shiny nardoo		č		1/1
F.G.10		maionoaooao		511117 1141400		-		1/ 1

Kingdom Class		Family	Scientific Name	Common Name	Ι	Q	А	Records
plants	land plants	Martvniaceae	Martvnia annua	small-fruited devil's claw	Y			2/2
plants	land plants	Menispermaceae	Pachygone ovata			С		1/1
plants	land plants	Mimosaceae	Leucaena leucocephala subsp. leucocephala		Y			1/1
plants	land plants	Mimosaceae	Neptunia gracilis forma gracilis			С		1/1
plants	land plants	Mimosaceae	Desmanthus leptophyllus		Y	-		1/1
, plants	land plants	Mimosaceae	Leucaena leucocephala		Y			5
plants	land plants	Mimosaceae	Vachellia farnesiana		Y			1/1
plants	land plants	Mimosaceae	Neptunia monosperma			С		1/1
, plants	land plants	Mimosaceae	Acacia leptostachya	Townsville wattle		С		1/1
plants	land plants	Mimosaceae	Acacia iackesiana			Ċ		1/1
plants	land plants	Mimosaceae	Acacia tephrina			Ċ		2/2
, plants	land plants	Mimosaceae	Acacia hemslevi			С		1/1
plants	land plants	Mimosaceae	Senegalia			-		1/1
plants	land plants	Mimosaceae	Neptunia major			С		3/3
, plants	land plants	Molluginaceae	Glinus oppositifolius			С		1/1
plants	land plants	Molluginaceae	Glinus lotoides	hairv carpet weed		Ċ		1/1
plants	land plants	Molluginaceae	Mollugo verticillata	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Y			2/2
, plants	land plants	Moraceae	Ficus rubiainosa forma rubiainosa			С		1/1
plants	land plants	Myrsinaceae	Lysimachia ovalis			С		2/2
plants	land plants	Myrtaceae	Éucalyptus shirleyi			С		1/1
, plants	land plants	Myrtaceae	Melaleuca bracteata			С		3/3
plants	land plants	Myrtaceae	Melaleuca viminalis			С		1/1
plants	land plants	Myrtaceae	Corymbia clarksoniana			С		2/2
plants	land plants	Myrtaceae	Corymbia lamprophylla			С		1/1
plants	land plants	Myrtaceae	Corymbia leichhardtii	rustyjacket		С		1/1
plants	land plants	Myrtaceae	Eucalyptus persistens			С		1/1
plants	land plants	Myrtaceae	Melaleuca leucadendra	broad-leaved tea-tree		С		1/1
plants	land plants	Myrtaceae	Eucalyptus platyphylla	poplar gum		С		2/2
plants	land plants	Myrtaceae	Eucalyptus raveretiana	black ironbox		С	V	1/1
plants	land plants	Myrtaceae	Eucalyptus xanthoclada	yellow-branched ironbark		С		2/2
plants	land plants	Myrtaceae	Leptospermum anfractum			С		1/1
plants	land plants	Myrtaceae	Eucalyptus drepanophylla			С		1/1
plants	land plants	Myrtaceae	Rhodomyrtus trineura subsp. trineura			С		1/1
plants	land plants	Myrtaceae	Eucalyptus brownii	Reid River box		С		1/1
plants	land plants	Myrtaceae	Melaleuca nervosa			С		4/4
plants	land plants	Myrtaceae	Gossia bidwillii			С		4/4
plants	land plants	Myrtaceae	Syzygium cumini		Y			1/1
plants	land plants	Myrtaceae	Lophostemon grandiflorus subsp. riparius			С		5/5
plants	land plants	Myrtaceae	Corymbia dallachiana			С		2/2
plants	land plants	Najadaceae	Najas tenuifolia	water nymph		С		1/1
plants	land plants	Nelumbonaceae	Nelumbo nucifera	pink waterlily		С		2/2
plants	land plants	Nyctaginaceae	Pisonia aculeata	thorny pisonia		С		2/2
plants	land plants	Orchidaceae	Cymbidium canaliculatum			С		1/1
plants	land plants	Papaveraceae	Argemone ochroleuca subsp. ochroleuca	Mexican poppy	Y			1/1
plants	land plants	Passifloraceae	Passiflora suberosa subsp. litoralis		Y			1/1
plants	land plants	Passifloraceae	Passiflora foetida		Y			1/1

Kingdom	dom Class Family Scientific Name Common Name	I	Q	А	Records			
plants	land plants	Phrymaceae	Glossostiama diandrum			С		1/1
plants	land plants	Phyllanthaceae	Phyllanthus reticulatus			С		1/1
plants	land plants	Phyllanthaceae	Poranthera microphylla	small poranthera		С		1/1
plants	land plants	Phyllanthaceae	Bridelia leichhardtii	·		С		1/1
plants	land plants	Phyllanthaceae	Antidesma parvifolium			С		1/1
, plants	land plants	Phyllanthaceae	Breynia oblongifolia			С		2/2
plants	land plants	Phyllanthaceae	Phyllanthus carpentariae			С		1/1
, plants	land plants	Phyllanthaceae	Flueggea virosa subsp. melanthesoides			С		3/3
, plants	land plants	Phyllanthaceae	Phyllanthus maderaspatensis			С		1/1
plants	land plants	Phyllanthaceae	Phyllanthus minutiflorus			С		1/1
plants	land plants	Picrodendraceae	Petalostigma banksii			С		1/1
plants	land plants	Picrodendraceae	Dissiliaria indistincta			С		1/1
plants	land plants	Pittosporaceae	Bursaria incana			С		1/1
plants	land plants	Plantaginaceae	Scoparia dulcis	scoparia	Y			2/2
plants	land plants	Plantaginaceae	Mecardonia procumbens		Y			1/1
plants	land plants	Plantaginaceae	Bacopa floribunda			С		2/2
plants	land plants	Poaceae	Chionachne cyathopoda	river grass		С		2/2
, plants	land plants	Poaceae	Dichanthium annulatum	sheda grass	Y			1/1
plants	land plants	Poaceae	Elytrophorus spicatus	C		С		1/1
plants	land plants	Poaceae	Eragrostis parviflora	weeping lovegrass		С		1/1
, plants	land plants	Poaceae	Heteropogon triticeus	giant speargrass		С		1/1
plants	land plants	Poaceae	Panicum trachyrhachis	0 1 0		С		1/1
plants	land plants	Poaceae	Alloteropsis semialata	cockatoo grass		С		1/1
, plants	land plants	Poaceae	Chionachne hubbardiana	C C		С		1/1
plants	land plants	Poaceae	Echinochloa turneriana	channel millet		С		1/1
plants	land plants	Poaceae	Enneapogon lindleyanus			С		1/1
plants	land plants	Poaceae	Urochloa subquadripara		Y			1/1
plants	land plants	Poaceae	Dactyloctenium radulans	button grass		С		1/1
, plants	land plants	Poaceae	Echinochloa frumentacea	Siberian millet	Y			1/1
plants	land plants	Poaceae	Sporobolus actinocladus	katoora grass		С		1/1
plants	land plants	Poaceae	Sporobolus jacquemontii	C C	Y			2/2
plants	land plants	Poaceae	Sporobolus australasicus			С		1/1
plants	land plants	Poaceae	Ériochloa pseudoacrotricha			С		1/1
plants	land plants	Poaceae	Rottboellia cochinchinensis		Y			2/2
plants	land plants	Poaceae	Dinebra panicea var. brachiata		Y			1/1
plants	land plants	Poaceae	Sorghum nitidum forma aristatum			С		1/1
plants	land plants	Poaceae	Hymenachne amplexicaulis 'Olive'		Y			3
, plants	land plants	Poaceae	Aristida holathera var. holathera			С		1/1
plants	land plants	Poaceae	Bothriochloa bladhii subsp. bladhii			С		2/2
plants	land plants	Poaceae	Bothriochloa decipiens var. decipiens			С		2/2
plants	land plants	Poaceae	Panicum decompositum var. decompositum			С		1/1
plants	land plants	Poaceae	Dichanthium sericeum subsp. polystachvum			Ċ		1/1
plants	land plants	Poaceae	Bothriochloa decipiens var. cloncurrensis			С		1/1
plants	land plants	Poaceae	Orvza sativa		Y	-		1/1
plants	land plants	Poaceae	Eulalia aurea	silky browntop	-	С		1/1
plants	land plants	Poaceae	Dinebra neesii	- , F		Č		2/2

Kingdom Class		Family	Scientific Name	Common Name			А	Records
plants	land plants	Poaceae	Melinis repens	red natal grass	Y			1/1
plants	land plants	Poaceae	Chloris inflata	purpletop chloris	Y			1/1
plants	land plants	Poaceae	Setaria surgens			С		1/1
plants	land plants	Poaceae	Sorghum bicolor	forage sorghum	Y			5/5
plants	land plants	Poaceae	Sorghum x almum	6 6	Y			2/2
plants	land plants	Poaceae	Dinebra ligulata			С		1/1
plants	land plants	Poaceae	Eriochloa crebra	spring grass		С		1/1
plants	land plants	Poaceae	Leersia hexandra	swamp rice grass		С		1/1
plants	land plants	Poaceae	Themeda triandra	kangaroo grass		С		1/1
, plants	land plants	Poaceae	Chloris pectinata	comb chloris		С		1/1
, plants	land plants	Poaceae	Panicum laevinode	pepper grass		С		1/1
, plants	land plants	Poaceae	Sorahum halepense	Johnson grass	Y			2/2
, plants	land plants	Poaceae	Sporobolus caroli	fairy grass		С		1/1
plants	land plants	Poaceae	Arundinella setosa	, , ,		Ċ		1/1
, plants	land plants	Poaceae	Cenchrus purpureus		Y			1/1
plants	land plants	Poaceae	Orvza meridionalis			С		1/1
plants	land plants	Poaceae	Panicum trichoides			Ċ		1/1
plants	land plants	Poaceae	Eragrostis elongata			Ċ		1/1
plants	land plants	Poaceae	Orvza australiensis			Ċ		1/1
plants	land plants	Poaceae	Oxvchloris scariosa	winged chloris		Ċ		1/1
plants	land plants	Poaceae	Cenchrus caliculatus	hillside burrgrass		Ċ		1/1
plants	land plants	Poaceae	Dichanthium fecundum	curly bluegrass		Ċ		3/3
plants	land plants	Poaceae	Sorghum arundinaceum	Rhodesian Sudan grass	Y			1/1
plants	land plants	Poaceae	Themeda quadrivalvis	grader grass	Y			5/1
plants	land plants	Poaceae	Vacoparis laxiflorum	3		С		1/1
plants	land plants	Poaceae	Alloteropsis cimicina			Ċ		1/1
plants	land plants	Polygonaceae	Persicaria barbata			Č		1/1
plants	land plants	Polygonaceae	Polvaonum plebeium	small knotweed		Č		2/2
plants	land plants	Polygonaceae	Persicaria lapathifolia	pale knotweed		Ċ		2/2
plants	land plants	Polygonaceae	Persicaria decipiens	slender knotweed		Č		1/1
plants	land plants	Pontederiaceae	Monochoria australasica			Č		1/1
plants	land plants	Pontederiaceae	Monochoria cvanea			Ċ		1/1
plants	land plants	Proteaceae	Grevillea parallela			Č		1/1
plants	land plants	Proteaceae	Grevillea glauca	bushv's clothes pea		Č		1/1
plants	land plants	Proteaceae	Grevillea striata	beefwood		Č		1/1
plants	land plants	Pteridaceae	Ceratopteris thalictroides			Č		1/1
plants	land plants	Pteridaceae	Cheilanthes nudiuscula			Č		1/1
plants	land plants	Pteridaceae	Cheilanthes pumilio			č		1/1
plants	land plants	Pteridaceae	Cheilanthes brownii			č		2/2
plants	land plants	Pteridaceae	Adiantum atroviride			Č		1/1
plants	land plants	Pteridaceae	Cheilanthes sieberi subsp. sieberi			Č		1/1
plants	land plants	Putraniivaceae	Drvpetes deplanchei	arev boxwood		č		1/1
plants	land plants	Rhamnaceae	Alphitonia excelsa	soap tree		Č		1/1
plants	land plants	Rhamnaceae	Ventilago viminalis	suppleiack		č		1/1
plants	land plants	Rhamnaceae	Ziziphus mauritiana	Indian jujube	Y	5		2/1
plants	land plants	Rubiaceae	Nauclea orientalis	Leichhardt tree	-	С		1/1

Kingdom	Iom Class   Family   Scientific Name   Common Name		I	Q	А	Records		
plants	land plants	Rubiaceae	Dentella repens	dentella		С		1/1
plants	land plants	Rubiaceae	Spermacoce sp. (Lorim Point A.Morton AM1237)			С		1/1
plants	land plants	Rubiaceae	Larsenaikia ochreata			С		1/1
plants	land plants	Rubiaceae	Scleromitrion galioides			С		1/1
plants	land plants	Rubiaceae	Timonius timon var. timon			С		4/4
plants	land plants	Rubiaceae	Psychotria daphnoides var. daphnoides			С		1/1
plants	land plants	Rubiaceae	Pavetta australiensis var. australiensis			С		1/1
plants	land plants	Rutaceae	Acronychia laevis	glossy acronychia		С		1/1
plants	land plants	Salviniaceae	Salvinia molesta	salvinia	Y			1/1
plants	land plants	Salviniaceae	Azolla rubra			С		1/1
plants	land plants	Salviniaceae	Azolla pinnata	ferny azolla		С		1/1
plants	land plants	Santalaceae	Exocarpos latifolius	-		С		1/1
plants	land plants	Sapindaceae	Harpullia hillii			С		2/2
plants	land plants	Sapindaceae	Atalaya multiflora	broad-leaved whitewood		С		1/1
plants	land plants	Sapindaceae	Cupaniopsis anacardioides	tuckeroo		С		2/2
plants	land plants	Sapindaceae	Alectryon connatus	grey birds-eye		С		1/1
plants	land plants	Sapindaceae	Arytera divaricata	coogera		С		1/1
plants	land plants	Sapindaceae	Cardiospermum halicacabum var. halicacabum	-	Y			1/1
plants	land plants	Sapotaceae	Amorphospermum antilogum			С		1/1
plants	land plants	Sapotaceae	Planchonella cotinifolia var. pubescens			С		1/1
plants	land plants	Scrophulariaceae	Myoporum acuminatum	coastal boobialla		С		1/1
plants	land plants	Solanaceae	Datura inoxia		Y			1/1
plants	land plants	Solanaceae	Solanum torvum	devil's fig	Y			1/1
plants	land plants	Solanaceae	Solanum sporadotrichum	-		NT		1/1
plants	land plants	Solanaceae	Nicotiana glauca	tree tobacco	Y			1/1
plants	land plants	Solanaceae	Solanum ellipticum	potato bush		С		2/2
plants	land plants	Sparrmanniaceae	Grewia graniticola			С		1/1
plants	land plants	Sparrmanniaceae	Grewia australis			С		1/1
plants	land plants	Sparrmanniaceae	Grewia savannicola			С		1/1
plants	land plants	Sparrmanniaceae	Corchorus olitorius	jute		С		1/1
plants	land plants	Stackhousiaceae	Stackhousia intermedia	•		С		1/1
plants	land plants	Sterculiaceae	Brachychiton					1/1
plants	land plants	Stylidiaceae	Stylidium rotundifolium			С		1/1
plants	land plants	Thymelaeaceae	Pimelea sericostachya			С		1/1
plants	land plants	Turneraceae	Turnera ulmifolia		Y			3/3
plants	land plants	Vitaceae	Cissus cardiophylla			С		1/1

#### CODES

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

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

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

Records - The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon. This number is output as 999 if it equals or exceeds this value.

# Appendix G: Flora and Fauna Species List

Family	Scientific name	Common name		Status	
T anniy	Scientific fiame	Common name	Introduced <sup>1</sup>	NC Act <sup>2</sup>	EPBC Act <sup>2</sup>
Fauna					
Birds	A '1 1	W. 1		LC	
Accipitridae	Aquila audax	Wedge-tailed Eagle	-		-
Accipitridae	Hallastur sphenurus	Whistling Kite	-		-
Accipitridae	Milvus migrans	Black Kite	-		-
Artamidae	Artamus cinereus	Black-faced Woodswallow	-		-
Artamidae	Artamus leucorynchus	White-breasted Woodswallow	-		-
Artamidae	Cracticus nigrogularis	Pied Butcherbird	-		-
Artamidae	Gymnorhina tibicen	Australian Magpie	-		-
Cacatuidae	Cacatua galerita	Sulphur-crested Cockatoo	-		-
Cacatuidae	Calyptorhynchus banksii	Red-tailed Black-cockatoo	-		-
Campephagidae	Coracina papuensis	White-bellied Cuckoo-shrike	-		-
Ciconiidae	Ephippiorhynchus asiaticus	Black-necked Stork	-		-
Cisticolidae	<u>Cisticola exilis</u>	Golden-headed Cisticola	-		-
Columbidae	Geopelia humeralis	Bar-shouldered Dove	-	LC	-
Columbidae	Geopelia striata	Peaceful Dove	-	LC	-
Columbidae	Ocyphaps lophotes	Crested Pigeon	-	LC	-
Corvidae	Corvus coronoides	Australian Raven	-	LC	-
Cuculidae	Centropus phasianinus	Pheasant Coucal	-	LC	-
Dicruridae	Dicrurus bracteatus	Spangled Drongo	-	LC	-
Estrildidae	Lonchura castaneothorax	Chestnut-breasted Mannikin	-	LC	-
Estrildidae	Neochmia phaeton	Crimson Finch	-	LC	-
Estrildidae	Taeniopygia bichenovii	Double-barred Finch	-	LC	-
Falconidae	Falco peregrinus	Peregrine Falcon	-	LC	-
Halcyonidae	Dacelo leachii	Blue-winged Kookaburra	-	LC	-
Halcyonidae	Dacelo novaeguineae	Laughing Kookaburra	-	LC	-
Maluridae	Malurus melanocephalus	Red-backed Fairy-wren	-	LC	-
Megapodiidae	Alectura lathami	Australian Brush-turkey	-	LC	-
Meliphagidae	Entomyzon cyanotis	Blue-faced Honeyeater	-	LC	-
Meliphagidae	Manorina melanocephala	Noisy Miner	-	LC	-
Meliphagidae	Melithreptus albogularis	White-throated Honeyeater	-	LC	-
Meliphagidae	Stomiopera flava	Yellow Honeyeater	-	LC	-
Meropidae	Merops ornatus	Rainbow Bee-eater	-	LC	-
Monarchidae	Grallina cyanoleuca	Magpie-lark	-	LC	-
Monarchidae	Myiagra rubecula	Leaden Flycatcher	-	LC	-
Nectariniidae	Cinnyris jugularis	Olive-backed Sunbird	-	LC	-
Nectariniidae	Dicaeum hirundinaceum	Mistletoebird	-	LC	-
Oriolidae	Oriolus sagittatus	Olive-backed Oriole	-	LC	-
Oriolidae	Sphecotheres vieilloti	Australasian Figbird	-	LC	-
Pachycephalidae	Pachycephala rufiventris	Rufous Whistler	-	LC	-
Pachycephalidae	Colluricincla harmonica	Grey Shrike-thrush	-	LC	-
Pardalotidae	Pardalotus striatus	Striated Pardalote	-	LC	-
Pelecanidae	Pelecanus conspicillatus	Australian Pelican	-	LC	-
Phasianidae	Coturnix ypsilophora	Brown Quail	-	LC	-
Psittacidae	Aprosmictus erythropterus	Red-winged Parrot	-	LC	-
Psittacidae	Platycercus adscitus	Pale-headed Rosella	-	LC	-
Psittacidae	Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	-	LC	-
Psittacidae	Trichoglossus haematodus moluccanus	Rainbow Lorikeet	-	LC	-
Rhipiduridae	Rhipidura albiscapa	Grey Fantail	-	LC	-
Rhipiduridae	Rhipidura leucophrys	Willie Wagtail	-	LC	-
Threskiornithidae	Platalea regia	Royal Spoonbill	-	LC	-
Mammals	×	¥ <b>A</b>			
Emballonuridae	Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheathtail Bat <sup>3</sup>	-	Е	V
Emballonuridae	Saccolaimus sp.	Sheathtail Bat	-	LC	-
Leporidae	Oryctolagus cuniculus	European Rabbit	Y	-	-
Macropodidae	Notamacropus agilis	Agile Wallaby	-	LC	-
Miniopteridae	Miniopterus australis	Little Bent-wing Bat	-	LC	-
Miniopteridae	Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	-	LC	-
Molossidae	Chaerephon jobensis	Northern Freetail Bat	-	LC	-
Molossidae	Mormopterus lumsdenae	Northern Free-tailed Bat	-	LC	-
Molossidae	Mormopterus ridei	Eastern Free-tailed Bat	_	LC	_
Rhinolophidae	Rhinolophus megaphyllus	Eastern Horseshoe-bat	_	LC	_
Suidae	Sus scrofa	Feral Pig	Y	-	_
Vespertilionidae	Chalinolobus morio	Chocolate Wattled Bat	-	LC	-
Vespertilionidae	Chalinolobus nigrogriseus	Hoary Wattled Bat	-		-
Vespertilionidae	Myotis macropus	Large-footed Myotis	-	LC	-

### Table 1: Flora and fauna species observed during the field survey

Vespertilionidae	Myotis macropus	Large-footed Myotis	-	LC	-
Vespertilionidae	Scotorepens sp.	Broad-nosed Bat	-	LC	-
Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	-	LC	-
Reptiles					
Boidae	Aspidites melanocephalus	Black-headed Python	-	LC	-
Flora					
Amaranthaceae	Alternanthera ficoidea	Joyweed	Y	-	-
Amaranthaceae	Gomphrena celosioides	Gomphrena Weed	Y	-	-
Anacardiaceae	Pleiogynium timorense	Burdekin Plum	-	LC	-
Apocynaceae	Cryptostegia grandiflora	Rubber Vine	Y	-	-
Asteraceae	Ageratum conyzoides	Billygoat Weed	Y	-	-
Asteraceae	Emilia sonchifolia var. sonchifolia	Emilia	Y	-	-
Asteraceae	Tridax procumbens	Tridax Daisy	Y	-	-
Asteraceae	Xanthium occidentale	Noogoora Burr	Y	-	-
Cactaceae	Opuntia stricta	Prickly Pear	Y	-	-
Caesalpiniaceae	Lysiphyllum hookeri	Queensland Ebony	-	LC	-
Caesalpiniaceae	Parkinsonia aculeata	Parkinsonia	Y	-	-
Caesalpiniaceae	Senna obtusifolia	Sicklepod	Y	-	-
Caesalpiniaceae	Senna occidentalis	Coffee Senna	Y	-	-
Casuarinaceae	Casuarina cunninghamiana	River Oak	-	LC	-

Family	Scientific name	Common name	Introduced 1	Status	EPPC Act 2
Convolvulaceae	Argyreia nervosa	Woodrose	Y		
Convolvulaceae	Ipomoea sp.	Morning Glory	-	LC	-
Convolvulaceae	Ipomoea triloba	Littlebell	Y	-	-
Convolvulaceae	Xenostegia tridentata	-	-	LC	-
Cucurbitaceae	Cucumis anguria var. anguria	West Indian Gherkin	Y	-	-
Euphorbiaceae	Euphorbia heterophylla	Milkweed	Y	-	-
Euphorbiaceae	Euphorbia hirta	Asthma-plant Ballyacha Buch	Y V	-	-
Euphorbiaceae	Ricinus communis	Castor Oil Bush	I V	-	
Fabaceae	Aeschynomene americana var. americana	American Jointvetch	Y	_	
Fabaceae	Aeschynomene indica	Budda Pea	-	LC	-
Fabaceae	Alysicarpus sp.	-	Y	-	-
Fabaceae	Clitoria ternatea	Butterfly Pea	Y	-	-
Fabaceae	Crotalaria goreensis	Gambia Pea	Y	-	-
Fabaceae	Crotalaria pallida	Streaked Rattlepod	Y	-	-
Fabaceae	Macroptilium atropurpureum	Siratro	Y	-	-
Fabaceae	Macroptilium lathyroides	Phasey Bean	Y	-	-
Fabaceae	Millettia pinnata	Pongamia	-	LC	-
Fabaceae	Stylosanthes hamata	Caribbean Stylo	Y V	-	-
Fabaceae	Stylosanthes numilis	I ownsville Stylo	Y V	-	-
Lamiaceae	Masosphaarum suquaalans	Hyptis		-	-
Lamiaceae	Ocimum americanum	Basil	I V		
Laxmanniaceae	Lomandra sp	-	-		
Lecythidaceae	Planchonia careva	Cockatoo Apple	-		-
Malvaceae	Sida acuta	Spinyhead Sida	Y	-	-
Malvaceae	Sida cordifolia	Flannel Weed	Y	-	-
Malvaceae	Urena lobata	Urena Weed	Y	-	-
Marsileaceae	<i>Marsilea</i> sp.	Nardoo	-	LC	-
Meliaceae	Azadirachta indica	Neem	Y	-	-
Menyanthaceae	Nymphoides indica	Water Snowflake	-	LC	-
Mimosaceae	Albizia procera	-	-	LC	-
Mimosaceae	Leucaena leucocephala	Leucaena	<u>Y</u>	-	-
Mimosaceae	Vachellia farnesiana	Mimosa Bush	Y	-	-
Moraceae	Ficus opposita	Sandpaper Fig	-		-
Myrtaceae	Corymbia clarksoniana	Dallachy's Gum	-		-
Myrtaceae	Corymbia tassellaris	Moreton Bay Ash	-		-
Myrtaceae	Eucalyntus platyphylla	Poplar Gum			
Myrtaceae	Eucalyptus pratypnytta Eucalyptus tereticornis	Forest Red Gum	-		-
Myrtaceae	Lophostemon grandiflorus	Northern Swamp Mahogany	-		-
Myrtaceae	Lophostemon suaveolens	Swamp Box	-	LC	-
Myrtaceae	Melaleuca fluviatilis	-	-	LC	-
Myrtaceae	Melaleuca leucadendra	Weeping Tea-tree	-	LC	-
Myrtaceae	Melaleuca nervosa	-	-	LC	-
Myrtaceae	Melaleuca viridiflora	Broad-leaved Tea-tree	-	LC	-
Nymphaeaceae	Nymphaea gigantea	Blue Water Lily	-	LC	-
Onagraceae	Ludwigia sp.	-	-		-
Pandanaceae	Pandanus sp.	Screw Pine	- -	LC	-
Papaveraceae	Argemone mexicana Dassiflora fostida	Stinking Dessionfmit	<u> </u>	-	-
Phyllanthaceae	Flueggeg virosa	White Current	1		-
Phyllanthaceae	Phyllanthus viroatus	-			
Pittosporaceae	Bursaria incana	Prickly Pine			
Poaceae	Alloteropsis cimicina	-	-		-
Poaceae	Aristida sp.	-	-	LC	-
Poaceae	Arundinella sp.	Reedgrass	-	LC	-
Poaceae	Bothriochloa pertusa	Indian Bluegrass	Y	-	-
Poaceae	Cenchrus ciliaris	Buffel Grass	Y	-	-
Poaceae	Chloris gayana	Rhodes Grass	Y	-	-
Poaceae	Chloris inflata	Purpletop Chloris	Y	-	-
Poaceae	Dichanthium sericeum	Silky Blue-grass	-		-
Poaceae	Digitaria sp.	-	- -	LC	-
Poaceae	Echinochioa colona Enteropogon ramosus	Twirly Windmill Grass	Ĭ		-
Poaceae	Enteropogon rumosus				
Poaceae	Eriachne sp	-	_		
Poaceae	Heteropogon contortus	Black Speargrass	_		-
Poaceae	Hymenachne amplexicaulis	Hymenachne	Y	-	-
Poaceae	Iseilema vaginiflorum	Red Flinders Grass	-	LC	-
Poaceae	Leersia hexandra	Swamp Rice Grass	-	LC	-
Poaceae	Megathyrsus maximus	Guinea Grass	Y	-	-
Poaceae	Melinis repens	Red Natal Grass	Y	-	-
Poaceae	Oryza sp.	-	-		-
Poaceae	Panicum sp.	- Amorican D-42- T-11 C	-	LC	-
Poaceae	Sporobolus patalonsis/musauid-li-	Giant Dat's Tail Grass		-	-
Poaceae	Themeda quadrivalvis	Grader Grass		-	-
Poaceae	Urochlog mosambiognesis	Sahi Grass		-	-
Poaceae	Urochloa mutica	Para Grass		-	
Polygonaceae	Persicaria attenuata	Water Pepper	-	LC	_
Pontederiaceae	Monochoria vaginalis	Bog Hyacinth	-	LC	-
Proteaceae	Grevillea striata	Beefwood	-	LC	-
Rhamnaceae	Alphitonia excelsa	Soap Tree		LC	-
Rhamnaceae	Ziziphus mauritiana	Chinee Apple	Y	-	-
Rubiaceae	Mitracarpus hirtus	White Eye	Y	-	
Rubiaceae	Richardia brasiliensis	White Eye	Y	-	-

Femily	Seientifie nome	Common nome		Status			
гатту	Scientific name	Common name	Introduced <sup>1</sup>	NC Act <sup>2</sup>	EPBC Act <sup>2</sup>		
Sapindaceae	Atalaya hemiglauca	Whitewood	-	LC	-		
Scrophulariaceae	Eremophila mitchellii	False Sandalwood	-	LC	-		
Scrophulariaceae	Myoporum acuminatum	Coastal Boobialla	-	LC	-		
Solanaceae	Physalis angulata	Wild Gooseberry	Y	-	-		
Solanaceae	Solanum torvum	Devil's Fig	Y	-	-		
Sparrmanniaceae	Grewia asiatica	Grewia	Y	-	-		
Sparrmanniaceae	Triumfetta rhomboidea	Chinese Burr	Y	-	-		
Typhaceae	Typha domingensis	Cumbungi	-	LC	-		
Verbenaceae	Lantana camara	Lantana	Y	-	-		
Verbenaceae	Stachytarpheta jamaicensis	Jamaica Snakeweed	Y	-	-		

<sup>1</sup> Introduced: 'Y' (non-native). '-' (native species).

<sup>2</sup> Status under Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) and Queensland *Nature Conservation Act* 1992 (NC Act). EX (Extinct), CE (Critically Endangered), E (Endangered), V (Vulnerable), NT (Near Threatened), SL (Special Least Concern), Least Concern (LC) and M (Migratory).

<sup>3</sup> This species was possibly recorded during the field survey, but it could not be confirmed.

Appendix H: Vegetation Assessment Proformas

Project number/name:	13503	1.	Pro	oject location:	: HPS	2.	
Site name: $ee_a$ (f	on ad	uistance D access)	ate: 25/57	121	Observ	/ers:	
Latitude: -19.738569	Longitude	e; D 6697 1	atum: 1) 597 84	Photos:	North: East: _		South:
VEGETATION RE (as mapped): 11-3-7	( 11. 3. ;	25/11.3 256	, RE (	observed):	11.3.7		
General vegetation descri	iption:	Can box	lac d	het I fai	e la	Marine de	and an all formal
		or reat		al a cor	CIA	G.P.C.	ng Cor 19-19
Layer^ Cover*	Height Ra	ange D	ominant spec	cies* s (or da	4,61	Cla	[Layer: E, T1, T2, T3, S1, S2, G]
72 5	9-12		TI SEP.				
<u>SI</u> <u>S</u>	1.5 -	<u>·</u> ]	217 Mar	u* Cry	gra*	Gee St	572
A D	0-1		Chi ME"	· Sta Scat	y ny po na	Shi ham	Art Cat, let Con,
• 9A. • • • • • • • • A • • • • • • • • • •		r had har par par has the life life life life his wir par its spin in	Soo jac	*	a man mar ban see ta ta - ta bar har har m	Silterity .	fere State - There a fere de There
						fen den sei um um um ven um om den ter ein (på te	
			• • • • • • • • • • • • • • • • • • •				
LANDFORM	Situation'	*: P;	attern*:	Slope po:	sition*: モ		Slope angle:
SOIL (topsoil)	Depth: {D	eep/Shallow/Sł	keletal} Text	ture:		Colour:	
Notes: Not ascertau	nod -	likely	Clay 10	rown			
DISTURBANCE Seve	erity/Exter	nt^  Notes (inf	o source, fire	scar height, ti	me since e	event)	
Fire	0	{scorched tru	nk/some crov	wn death/muc	h crown d	eath}	
Logging / clearing	200	whicht					
Non-native plant cover	300				i hart big		
Grazing	20					***********	
Feral diggings	12	Din ach	~~~~~				
Frosion	()						
Storm	( )		ac our lace sum han, som han har han han som mit haf ann haf	all blif tals har thic last har tan hat dan han han han han han han	s land flow have black have black hand MMC Size. Hind has	ter tilf die las taat aaf het kei tee die tie het het het he	
Human litter/waste							
Infractructure	à	/huilding/roa	d/tracks/fend	~_l			
Amificial naise/light	2	[Dunung/.e.	d/ liacnoy .c				
		{noise/ iight	****				
Other							
Sovority: (0 nil) - 3 (severe); Ext	l tont: Localise	 ~~! (I \ / Widesprea	- /\w/)· Info. Sour	ree: Direct obs. (#)	/ Anecdotal	ം എ) / Combina	eion (#@)]
LARITAT CHARACTERISTIC	CS - ABUN		d (ww), miner	Cer Direct exert (,	/ Ансонска	((()))	
Feature	Ahundanc	e^ - Notes		Waterbo	dv: {Marin	e/Fstuarine/R	iverine/Palustrine/Lacustrine}
large (>10cm) tree hollow	vs í	1		{Dry/Fillin	g/Receding	/Unknown or	Neutral}   {Still/Flowing}
Small (<10cm) tree hollow	/s	*	n den mit den ber mit ben beit ben als den det den bei be	{Natural/	Modified}	{Pugging/H	eavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	Ĩ~?	1. The second	n, man and man and has been une and use has been and man are	{Clear/Tur	bid/Surface	e Film Oil/Surf	ace Film Organic}
Course litter (>2cm diam.)	1 2			Notes:	Noter	Dr. atta	Las and bull
Fine litter (<2cm diam.)	2				ojacen	dianay	C 352 No
Decorticating bark			en har fan hue ger yn en me op her ne dit hie hie hie	(u	sh		
Cryntopam	~	. I an has an out the fac the first line first line for the first line in	1. 20 Mi Mi Mi At An Hi Mi Mi Mi Mi Mi Mi Mi Mi				
Soil cracks							
Stones (20-60cm)	$\overline{\cap}$		ar die Jarah im Dir im air mit in im Di im 20 M	Caves:	{Deep/S	hallow/Overh	ang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0				ι,.	///www,	ung, orentee,
Large Boulders (>2m)					-		
Exfoliating rock				Ratio gra	ss/forb (%	6): coli	1. a
Active flowering (T & S)			*****			in all	40
Other		1 a ma dala 100 keta 100 ket	al and has been been been and any specific and has been been been been been been been bee	<u>Ground c</u>	:over (%):	Bare Ground	l : Rock : Litter : Live
	- make			04/0/50	• • • • • • • • • • • • • • • • • • • •		J 3 · *(3
					<u>m transec</u>	<u>t):</u>	
(Abundance: Nil(0), 1(Rare), 2(R	are/Occasio	nal), 3(Occasional	), 4(Occasional/C	Common), 5(Comm	non), 6(Com	mon/Abundanc	ce), 7(Abundance)
Site sketch/notes:							

Project number/name:	13503	7	Projec	t location:	HPS2.	
Site name:		Dat	e:		Observers:	
16-3			25 /5/2		his	
Latitude:	Longitude	e: Dat	um:	Photos:	North: 14 /4 %	South: < </td
-19,140910	147.0	84890	wSG-84		East: 96/100	West: 91/141
VEGETATION	24.				2 251	
RE (as mapped): 11-3	1.66		RE (obs	erved):	5.630.	
General vegetation descr	iption: 🖡	rel lev &	Lop gra	niportie	an logetat	on forging crocethe.
Layer^ Cover*	Height Ra	inge Dor	ninant species	*		[Layer: E, T1, T2, T3, S1, S2, G]
M	15-20	Ne	1 au 100	ora. Cas	cun M	il pin, fox for cor cla
		and the wide the field later part and this has that had been the this field been the the this field been the		J		• •
T2 S	4-5	TI	spp, Lys	hao, pan	Sp	
. الله عن الله الله الله الله الله الله الله الل						
SI S	2-4	lan	camp lys	i hoo, fi	copp, Cry	grei yan punt
, alt has any had not bed any one and not bed had had had had had had had had had ha				~ .V		
	<u>OTIS</u>		Praz X	m pun	AN 43., 1	o <u>m sp.</u>
	Cituation	*. D		Clenn	*ion*.	Clana angle:
	Situation R	ri Pati	lem*:	Slope posi	f	siope angle:
SOIL (topsoil)	Depth: {D	eep/Shallow/Skel	etal} Texture	:	Colour:	
Notes:				sondy.	Tor	ι.
DISTURBANCE Seve	erity/Exter	nt^l Notes (info	source, fire sca	r height, tim	e since event)	
Fire	0	scorched trunk	/some crown (	death/much	crown death}	
logging / clearing	C					
Non-native plant cover	1	Dan ball, Mair Min, Ball, Mair Man Mini Jan, Mair Jap, Mair Spin, Lan, Spin, Lan, Mair	'dan laaf had laki bik Şidi Daç' bai ba. Min bya ana han Şigi iya '	inn per hen lan lan per ken lan lan ber ber inn l	ee, tee land tee, tee, ee, has bee, had him tao ma him him me ma tao tao tao tao tao	
Grazing	14					
	100					
rerai uiggirigs		Con		nn, ma ma aine inte inte aine inte das aine inte inte inte i	un Mil una ana ina inte luc una ina una una una una una una una una una u	
	<u> </u>	Lice a b	MES	han dan dan dan dan dan dan any san dan dan dat d	ala land land land land land land land l	
Storm	Q					
Infractructure	$\overline{Q}$	(huilding/rood/	tracks/fancel			
	0	(poice /light)	(acks/leffce/			
Artificial noise/light	0	{noise/light}				
Other						
[Severity: (0 nil) - 3 (severe); Ext	I tent: Localise	l d (L) / Widespread (\	W); Info. Source: [	Direct obs. (#) /	Anecdotal (@) / Combi	nation (#@)]
HABITAT CHARACTERISTIC	CS - ABUNI	DANCE				
Feature	Abundance	e^ - Notes		Waterbod	y: {Marine/Estuarine,	/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	vs 3			(Dry)Filling/	Receding/Unknown	or Neutral}   {Still/Flowing}
Small (<10cm) tree hollow	vs 5			{Natural/M	odified}   {Pugging/	Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	4			{Clear/Turb	id/Surface Film Oil/Su	rface Film Organic}
Course litter (>2cm diam.	) 3			Notes:		a change down a col
Fine litter (<2cm diam.)	4			Ţ		Ja Air 6: *
Decorticating bark	5				DS-91 h	new the type "
Cryptogam	Õ					
Soil cracks	6			(		
Stones (20-60cm)	0			Caves:	{Deep/Shallow/Ove	rhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0		un une une vers della		_	
Large Boulders (>2m)	0				- Siliting to Sector	
Exfoliating rock	Ø			Ratio grass	s/forb (%):	
Active flowering (T & S)	4				5900	, 
Other	0			Ground co	ver (%): Bare Groui	nd : Rock : Litter : Live
				And I	30	0 0 0 40
				<u>CWD (50m</u>	transect):	
[Abundance: Nil(0), 1(Rare), 2(R	are/Occasion	nal), 3(Occasional), 4	(Occasional/Com	non), 5(Commo	on), 6(Common/Abunda	nce), 7(Abundance)
Site sketch/notes:						

Project number/name:	13505	7.	Proje	ct location:	HPS.	2.		
Site name:			Date:					
26-5			2575/2			Ken	*	
Latitude:	Longitude	e:	Datum:	Photos:	North: 🗲	65	South: 🔏 4	
-19.749988	147.09	6419	wsG-84.		East: 🦧	5	West: 🏀	
VEGETATION RE (as mapped): 1.3	.7/11:	3.35	RE (ob	served):	(1.3 35	F		
General vegetation descri	iption: C	of tas	John nation	( with a	logal is	or ha	fur na	and COT 500.
_			ορ	100000	imter n		the but	
Layer^ Cover*	Height Ra	ange	Dominant specie	s*	Corela	Car	[Layer: E, T1, T	2, T3, S1, S2, G]
TI S	10 4	0	LOT Tes, E	JE PIR	64-1 44			
72 5	5-10		TI SPP ., M	1 ASI	MARINE MIN	<u><u><u> </u></u></u>	CON	
5 5	1.5 -	2	Cry gray	MIA COL	7.7. 14	Card +		An an antipo di seconte
<u> </u>	0-1	5	Sty Rom,	<u>Sty 50a</u> '	Alt_	Lict ,	spajac 1	lan sp. Het
			càh .		-			
		had increase has had has buy had the bir had set t					min mer sin som mill sen mit sin sin me tilt bed mit sin bit bit bit	ge gan ban bar dar die best best best das ber bie best das best best best des best das best das best des best d
					داد الله والله بالو الله علم وال وي وي الله الرام ال			
LANDFORM	Situation	*:	Pattern*: பி	Slope po	sition*: F		Slope angle:	
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal} Textur	e:		Colour:		
Notes:	• -• •		CI	ci.d		Ocurs	^	
	-			IJ		DIGN		
DISTURBANCE Seve	erity/Exter	nt^  Notes (	info source, fire so	ar height, ti	me since e	vent)		
Fire	0	{scorched	trunk/some crown	death/muc	h crown de	eath}		
Logging / clearing	0	2	ri ang Jipa Bay Bay Linu Jipa May dala jala dan dan dan Bah 🤐 Bah 💷 📟 🤐					
Non-native plant cover	71.2	a lan ma an ma an ma an ma an ma an ma an ma	er haf han van han bin him an van hen hen het bin die an het het Bin Bin bin Bin	144 ML 184 ML 184 ML 194 ML 184 ML 184 ML 184 ML			tern som som torn vers her han ben ben som tord bed ben bet bit i	nn ann an air lead lead ann ann ann ann ann ann ann ann ann a
Grazing	6							***
Feral diggings	ŏ							
Frasion	R				مد الذا من مله الله الله علم من من حو من الن م	tas ine ilia ant iliy ilia ine ilii Pie Pi	man dan ange dae ange dae per gan dan dae aka dad mit bali bili mit i	
Storm	~~~~	The second second second second second second second	af har han har her her hel had har hen her her her her her her her her her	nar mat ma, 'na har ber inn inn inn me' inn inn in	n' any ine ine ine ine tet biy any ine ine ine ine			nn me han me me na ha, han
Human littar/wasta								
numan inter/waste		(huilding /	and the also for an					
		[{building/r	bad/tracks/fence	, 				gin ayna da'n gan blar bin llan bin bin bin bin bin bin bin bin bin bi
Artificial noise/light	<u> </u>	{noise/ligh	t}	na na oa ye ye ye ta ha iye ka ha jer ha h	r in in in in in in in			
Other	Constitution of the local division of the lo							
				D:	/ A		inerien (#@)]	
[Sevenity: (U nii) - 3 (severe); Exi		Daniesp	read (w); into. Source	Direct obs. (#)	/ Anecuotai	(@) / Comb	ination (#@)]	
	<u>LS - ABUN</u>	DANCE		Matasha	ality the sector of	/=		·····
Feature	Abundanc	e^ - Notes		(Dww./Cillin	iviarine α/Decediaci	e/Estuarine /Linknown	er Neutrall	The/Lacustrine}
Large (>10cm) tree hollov	vs 3		ng gina lina gina dina anti dina anti, lina dina 100, lina dina lina dina dina dina dina dina dina dina d	{Dry/Fillin 	Wedified)		(Hoover Crozing (	ight Grazing)
Small (<10cm) tree hollow	vs <u>3</u>	a international services and had been been like like the U	na ma kao ami kao ami kao ma kao kao ao kao kao kao kao kao kao kao	(Clear/Tw	widumeus		/ Heavy Grazing/L	ight Grazing/
Fallen logs (>10cm diam.)					Did/Surrace		unace riin Orgai	ncj
Course litter (>2cm diam.	<u> 4</u>			Notes:	~ 1			
Fine litter (<2cm diam.)	3			W				
Decorticating bark	2	: ) (on the gap (on (on ins) ins init tell the line i	m in. In. Sci Di M. M. M. an an Di MI Di William Di MI Di Mi Di Mi	- 75	2			i da
Cryptogam	0				disarra	while 6	sumpet at	point.
Soil cracks	0		la da da da la po la da la por la da la sun la la da la la la por la por ve		(2) (2)		1 (0 ) 4	
Stones (20-60cm)	0			<u>Caves:</u>	{Deep/Si	hallow/Ov	erhang/Crevices/	Boulder Plies}
Boulders (b1cm-2m)	<u> </u>		de hilt two hal line. Die two 100 000 bie hie her hie her hie hie hie hie hie hie hie hie h	. Mile lauf Tell	AA.			
Large Boulders (>2m)				D-47		1.		
Extoliating rock				<u>Katio gra</u>	iss/tord (%	ம் 👔	0/80	
Active flowering (T & S)				· ·	1013		F	
Other				Ground	cover (%): /	ваге Groi	ina : KOCK : Litte	d)
					m trancoct			
		1	0.44			<u>ur</u>		,
[Abundance: Nil(0), 1(Rare), 2(F	are/Occasio	nal), 3(Occasio	nal), 4(Occasional/Cor	nmon), 5(Comi	mon), 6(Comr	mon/Abund	ance), 7(Abundanc	e)
Site sketch/notes:								

Project number/name:	13503	٦	Proje	ect location:	HPSZ	<u>L</u> .			
Site name:			Date:		Observe	ers:			
Latitude:	Longitude	2'	Datum	Photos:	North: 7	2	South 74		
-19.759525	147 0	88 570	WSG 84.	1 1101051	East:75	ý.	West: 76		
VEGETATION II 3	7/11.3	.35			11.37	x			
RE (as mapped):	Intion		RE (OI	served):		Alexan		<u></u>	
General vegetation descri		ior dal	do this next	d Ofen	0000	an fam. lin	e euc	pla	in
the distance	to S	æ							
Layer^ Cover*	Height Ra	inge	Dominant specie	25*			[Layer: E, T1, T2,	T3, S1, S2, G	]
	(4-1)	<u>0</u>	Co alat	1.10. SAL					
.s	1.5-	<u>}</u>	212 May *	Gre S	tr .				
<u>c</u> n	m-1		< ty sca*.	Het Con	Cur 11	16*			
	-342		5(0)-		7-74.16		a maa ama aan ama ama ama ama ama amb anyo disi tatii dina tiina safa gint dina		
ین کی بین میں میں میں میں اور	and, that then the line and any part and			an jin jil jil jil jil jin jin sa na ma jin jin an an an an					
***									
	Situation	*.	Pattern*·	Slope nos	ition*:	_	Slope angle:		
<u>E-III OIIII</u>	B		P	ticke bee	F				
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal} Textu	re:		Colour:	-	-	×.
Notes:			Cla	4		One	have		
				0		Jurk		3614	-
DISTURBANCE Seve	erity/Exter	nt^ Notes (	Into source, fire s	car neight, tir	ne since ev	nt)			
	0	{scorcned	crunk/some crowi	1 death/mucr	1 crown de	atn			
Logging / clearing	0	, and been perf then been two and and any series of	an a	aan han dan bin ann inn tan aik till din lait lik till din b	nn har bay laft mit na mi mi na mi bir bir b	y yn, hyp yny hen fan han Une Min Min Min	a tha 1999 (1999 (1999 (1997 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996 (1996	I fans van hand kan, kan, sam ditte kan ditte kan ditte	an an ha in he
Non-native plant cover	3.								
Grazing	2.00		ina ana mir ann bail ina ann ann ann ann ann ann ann ann ann				a dan dan Dir dar san ana ana ana ana ana ana ana ana ana		
Fredien	2		per, yes, han dan aya par lam lain lan din tur tin ann lair tur life dhe filir ber				a any pao pao any itanà amin' kao kao kao amin' kao amin' kao amin' kao amin' kao amin' kao amin' kao	) bits tips had not have the state and the state of	
Ctorm		i inge beg doe inse typ took had how the thic had had t	ne haf hid het het het het het niet mit mit mit mit mit mit mit mit mit mi			er inne foger inne joger hoer, food intil diele faar	n may hay igo ing ing ing has been into the ball has the distribution of the ball has been been		n,' lan lan lan dar hat lad ikk ikr dan ant ikk ikk ikk i
Human litter/waste									
Infrastructure		{building/r	oad/tracks/fence	S ICTIRA	the war & A	ronal	Nectory.		**********
Artificial noise/light		{noise/ligh	that the system of the		1 1, 1 1, 1 1, 1 1, 1 1, 1 1, 1 1, 1 1			ant par me jan jan ina dal die Un UN	
Other		lineise/ iigi	16 <b>)</b> 	lin ipa jug jul jua liik kin line ali iki ika ika iki iki iki iki		a ma las kas kas kas kas kas las lik ad	n inn bie haf bie ope ben ten tiet int die die die die verste die bie bie bie	i ana ana ang ang ing ing ing ing ing ing ing ing ing i	
[Severity: (0 nil) - 3 (severe); Ex	tent: Localise	ed (L) / Widesp	read (W); Info. Source	: Direct obs. (#)	/ Anecdotal (	@) / Comb	vination (#@)]		
HABITAT CHARACTERISTI	CS - ABUN	DANCE							
Feature	Abundanc	e^ - Notes		Waterbo	dy: {Marine	/Estuarine	e/Riverine/Palustrir	ne/Lacustrir	ne}
Large (>10cm) tree hollov	NS 2		مى مەر بور بور بور بور بور بور بور بور بور بو	Dry/Filling}	g/Receding/	Unknown	or Neutral}   {Sti	II/Flowing}	
Small (<10cm) tree hollow	NS 3	e e ano ano ano ano ano any ina ina ina ina ina ina ina	hao hao ilia ilia had hao hao ilia iliyo jiyo jiyo ilia ilia ilia ilia ilia ilia ilia ili	{Natural/N	Nodified}	{Pugging	g/Heavy Grazing/Lig	ht Grazing)	}
Fallen logs (>10cm diam.)	13			{Clear/Tur	bid/Surface	Film Oil/S	urface Film Organic	:}	
Course litter (>2cm diam.	1.3			Notes:	NA.				
Fine litter (<2cm diam.)	4			10 10 17 00					
Decorticating bark				Name Safe Web,					
Cryptogam	0								
Soll cracks	$\frac{O}{\alpha}$			Causer	(Deen/Ch	allow/Ou	orhong (Crowiegos /Pr		1
Stones (20-60cm)			dar 40. inn bar 60. 400 KL 101 407 ppp for bet bit tan 101 AL 101. Als bet	Laves.	{Deep/Si	allow/Ov	ernang/crevices/bo	Juider Piles	J
Large Bouldars (>2m)			ing has been into the surf part into this time and him has been that has been been been	ipen haaf fand ties	ALA				
Expliciting rock			می کا دند کا ما دی ده دی اور دو دو اور دو می او دی می دو می دو دو می دو دو دو دو دو دو دو د	Ratio gra	ss/forb (%)				
Active flowering (T & S)				Land Alter		-	20140		
Other	All and a second a		age gap bay wer, gap gap ga, gap ann ann ann ann dan ann dan bill like aini dair	Ground c	over (%): E	Bare Grou	und : Rock : Litter	: Live	
ma ban, per ma, ga, per gar per ban ban bin bin bin bin bin bin bin bin bin	i <sup>1</sup> an ai in ge be te te te te te	a an		bac bac hit the		5	: 0' (0'	85	
				CWD (50)	m transect	):			
[Abundance: Nil(0), 1(Rare), 2(	ہ Rare/Occasio	nal), 3(Occasio	onal), 4(Occasional/Co	mmon), 5(Comn	non), 6(Comn	non/Abund	dance), 7(Abundance)	)	
Site sketch/notes:									

Project number/name:	13503	57		Project lo	ocation:	HPS2	-			
Site name:			Date:			Observe	rs:			
RE-7			2.5	7512	1		en			
Latitude:	Longitude	: 	Datum:		Photos:	North: 6*	1	South: 10		
-14. ( 05000	(K.)	104-121	. 0	JSG 84		East: 71		West: {2_		
RE (as mapped):	1.3	7/43:	35	RE (observ	(ed):	1.3.35	, 670.			
General vegetation descri	iption:	C . al.	1	the base		الورينجية ويعدون	tion of	To the	SE	0
	1	tuc pla	N C	.01 123	yen	Caleron .	lu a	2 10 700	e 00,	SC.
MIX OF COIS	PP .,	10 ma	NE	just	Euc	pia	(11-5-	55).		
Lavort Covor*	Hoight Da	200	Dominar	t species*				flavor 5 T1 T2	T2 \$1 \$2 G	
Cover S	16	inge A	Gr s	n species Na Cor	tas			[Layel: 2, 11, 12,	13, 31, 32, 6]	
5 5	6-10	¥	TT s	D0 C.C	, St/					ere fan hie om hie inn die gen we nij die die in
- <b>A</b>	1.5 -	3	2.7	Mceas *	Gen St	5		m man, hann mann mar land man hann hanr hann hant Mith Yant Ank Mith Mith Mi	n inn, inn inn inn her bei ber bei, het Die by, ind bei	
- 9,				1						
G D	0-1.	5	Chi i	n.C*, Pan	50.	Sry Sce	* Sty	ham * Zi	1 Arasit	
	بر النا الح بي النا ال		ب المراجع الم			<u> </u>		,	, <u>e : : : : : : : : : : : : : : : : : : </u>	
**************************************					nn av be be be pa pa pe pu an an m			·	******	
	Ct++++++++++	*.	Dettern¥		lana nasi	+:		Clana angles		-
LANDFORM	Situation	7: R	Pattern*	: ቦ	siope posi	tion*:		Slope angle:		
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal}	Texture:			Colour:			
Notes:	Attention of the second			Cla	wt.		Dank	STRAM		
All the second s					)		C M.			
DISTURBANCE Seve	erity/Exter	nt^ Notes (i	nfo sourc	e, fire scar h	eight, tim	e since ev	ent)			
Fire	0	{scorched t	runk/som	e crown dea	ath/much	crown dea	ath}		و الم	
Logging / clearing	200	on p	<u>M</u>	lan kan ang pay ing ing jan gal kitu an init kal init				n mai tari una dati dine dina dine dine dine dine dine dine dine dine	n mar mar mar mar han han sint had per set yer. Set	had ben, ten, type gan, type ben, Mill, Mill, Mark Mill, St
Non-native plant cover	200	6 3	5	langer						
Grazing	10.	u den self den ben hen ben den Hen den gest and gest per		<u>v</u> .						**
Feral diggings	0		gar ma aya aya, mi, miy ma una ana dan			19 yila (10 km 10 km	na na na na na na er de fo fo in in t			
Erosion	6			and aan kan kan kan kan kan kat kat kan kan	nya mar miri mar ina mar mar ina peri yan in	en lange lagan bandi Tagge landi bindi Bandi Yiki Bann Yikir B	nna mir bas ma na, mir no nn mir bri n	ay ago ago ago ana ana ana ana kao ana kao kao kao kao kao kao kao kao	in this are last that and loss time see, lead the lead teer	har her gijt ops joge lengt hen hen blitt HAN Mine Mit
Storm	0									
Human litter/waste	0	fhuilding /u								
Artificial poice/light	BIL	{building/n	ad/ frack	spence						
Artificial noise/light		[noise/light	·/		ann an an an bai ba ba ba ba ba ba ba	er hen hen bac bije han dan hee ant hen hee i	10. Ile 14. 14. 15. 15. 16. 19. 19. 19. 19.	9, 99, 10, 1, 1 (0, 10) (0, 10, 10, 10, 10, 10, 10, 10, 10, 10, 1		
other										
[Severity: (0 nil) - 3 (severe); Ex	। tent: Localise	ed (L) / Widespi	ead (W); Ini	fo. Source: Dire	ect obs. (#) /	Anecdotal ((	@) / Combin	ation (#@)]		
HABITAT CHARACTERISTI	CS - ABUN	DANCE								
Feature	Abundanc	e^ - Notes			Naterbod	<b>y:</b> {Marine/	'Estuarine/	Riverine/Palustrii	ne/Lacustrine	}
Large (>10cm) tree hollow	NS <u>3</u>		der ber fich für sich die die die ber ber		Dry/Filling/	Receding/L	Jnknown o	r Neutral}   {St	ill/Flowing}	
Small (<10cm) tree hollow	NS 4	t pan lafe lan. Noo Mal May Say Ann Ma Mai Jan An	m, na ina lan an an an ina lad lan	and has been find had find that has been field with the	Natural/Me	odified}	{Pugging/I	Heavy Grazing/Lig	ght Grazing}	
Fallen logs (>10cm diam.)	3			{	Clear/Turb	Id/Surface H	-ilm Oil/Sui	fface Film Organi	C}	
Course litter (>2cm diam.	4	i an an an an an an Air de an an Air de air			votes:	Æ.				
Prine litter (<2cm diam.)	0					rup -				
Chuntogam	4	i in an in in an ar ar ar in in in in in	jan like ann like lain line like like like like like	tang angan lapa, tang jujat Blak. Ban lana juat kina ada, inda						
Soil cracks	6		10. II. II. II. II. AN							
Stones (20-60cm)	0				Caves:	{Deep/Sha	allow/Over	hang/Crevices/B	oulder Piles}	
Boulders (61cm-2m)	6			and then dies have have him have him dies with the			-	<b>•</b>	-	
Large Boulders (>2m)	6					1441 -	•			
Exfoliating rock	0			]	Ratio grass	s/forb (%)		alia		
Active flowering (T & S)							0	210		
Other	$\square$		han man hari kad dad kad pad ina. Ini. Mi		<u>Ground co</u>	ver (%): B	are Groun	d : Rock : Litter	: Live	
				-			12 -	0 2 8	0	
	1	ļ		1	LWD (50m	transect)		and the second statements	_	
[Abundance: Nil(0), 1(Rare), 2(	Rare/Occasio	nal), 3(Occasio	nal), 4(Occa	sional/Commo	n), 5(Commo	on), 6(Comm	on/Abunda	nce), 7(Abundance	)	
Site sketch/notes:										

Project number/name:	13503	7	Project locat	ion: HP	\$2.	
Site name: RE-8		Date:	K121	Obse	ervers: Pw).	
Latitude: 14 792343	Longitude ામ7. ાા	en Datum: 0978 Wester	Photo 84:	<b>os:</b> North East:	: 65 61	South: 66 West: 65
VEGETATION RE (as manned): (1.23)	7/11.3	· 35 (regranth)	RF (observed)	11.3.	7/11-335	
General vegetation descri	iption:	Luc ala and	(or the	GREA I	woodend	
Suntable to	r 81	F.		1		
Layer^ Cover*	Height Ra	nge Dominant	species*			[Layer: E, T1, T2, T3, S1, S2, G]
TI S	16 - 2	2 Gic	plas Cor	tes		
<u> </u>	65.9	4	P-j-ure-	211		
<u>51 5</u>	1.5-	4 2.2	maret, No	ic far*		
				0 L¥		
<u>e</u> y	0-1-	s Het	Cevi ho	Per .	JAY SCA, C	M M VIG NOS
			ram, An s	HI MI	1 30-	
			nam. Man ann ann ann ann ann ann ann ann ann			
LANDFORM	Situation*	*: Pattern*: B U	Slope 2	e position*: F		Slope angle:
SOIL (topsoil)	Depth: {De	eep/Shallow/Skeletal}	Texture:		Colour:	
Notes:			Schol	3-	Tan.	
DISTURBANCE Seve	erity/Exten	t^   Notes (info source	e, fire scar heigh	t, time sinc	e event)	
Fire	6	{scorched trunk/some	e crown death/r	nuch crown	death}	
Logging / clearing	0	······································		********		
Non-native plant cover	$(\omega)$	C him him him has not you bud hid ope him hyp- him upd figs has ingo him him him him him.				
Grazing	1W					
Feral diggings	0			per seja gan dan laki line disi Uler ikin disi disi disi disi		
Erosion	14	CICCE	une ine nut mo inu mo ini na ini na ant ant ant ini me me ini ini	toy togo togo togo tond tong type and toni illus and the		
Storm	<u> </u>					
Human litter/waste	0	ang gina gan pak pina liku man jina jina dara jala dara dari dari jina, jina dari dala mila dala mila dala dari				
Infrastructure	6	{building/road/tracks	/fence}			*
Artificial noise/light	0	{noise/light}	tar on he he me to the he as he he he as he he he	tyn tyn lage lans inn, fan Hair Mie Rin. Ban hân bak Lair	nn Mir 200 Mil Ro, Mil Ro, Mir 10, Mir Mir Mil AM, 407 Mil	
Other	•					
[Severity: (0 nil) - 3 (severe); Ext	I I tent: Localised	। d (L) / Widespread (W); Info	o. Source: Direct ob	s. (#) / Anecdo	tal (@) / Combina	tion (#@)]
HABITAT CHARACTERISTIC	CS - ABUNE	DANCE				
Feature	Abundance	e^ - Notes	Wate	rbody: {Ma	rine/Estuarine/R	Verine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	vs 2			illing/Recedi	ng/Unknown or	Neutral   {Still/Flowing}
Small (<10cm) tree hollow	vs 4-	t line han han han han naar taac aan alaa ahan han ana kar ahat han pes aha han are are are be-	{pratu	Mil/Modified	}   {Pugging/Hi	eavy Grazing/Light Grazing)
Fallen logs (>10cm diam.)	4	,	{Clear	MC-3		ace film organici - No wate
Course litter (>2cm diam.)			Notes	05-	- 63 -	s sm channel
Decorticating bark	<u> </u>			0	tak.	an rip veg-
Cryptogam	0	, pan jun han hipi hipi hani ani dan, ann ipin yan jun ipin tida nak hiba din din disi disi din din din din din		U -		7.7 Marsh
Soil cracks	0	) = = = = = = = = = = = = = = = = = = =	No	liparie	1 3	Lite marker ,
Stones (20-60cm)	6	a that they have more thank many more and they have that they have the they have the the part that	Cave	<u>s:</u> {Deep	o/Shallow/Overh	ang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0		ler, mr mr, oo, lab lin uu ill die oo een uu			
Large Boulders (>2m)	0				1.4	
Exfoliating rock	0		Ratio	grass/forb	(%): 25	175
Active flowering (T & S)		1 sijd like jan tuu uud open opd kan kuu san dan may ope uus jan kak kan dan kai san ika kai san sa	-			L. Deales (itter - time
Uther	- compared and the late, they had the link it.	, the last set we also had set the set. Here has had had been as the set of the set of the set of the set of the	<u>Grou</u>	na cover (%	si: Bare Ground	* <b>\$</b> * <b>\$</b>
			CWD	(50m trans	ect):	
[Abundance: Nil(0), 1(Rare), 2(R	are/Occasion	nal), 3(Occasional), 4(Occas	ional/Common), 5(0	Common), 6(Co	ommon/Abundand	ce), 7(Abundance)
Site sketch/notes:			wpt	- 7 -	(mobile (	stoppings.

Project number/name:	13503-	7		Project	location	HPS2			
Site name: RE-9			Date: 25	15/21		Observe	rs: Rus.		
Latitude: - 19.797163	Longitude	ugss	Datum: WSG 8-	4	Photos:	North: 57 East: 59	7	South: 51 West: 6	5 D
VEGETATION	7/11	2.35			mod)	11.3.35			
RE (as mapped): 11 @	iption:			RE (ODSe	rved):		<i>k</i> 1		4
	(	Euc pla	. <i>B</i> mina	Auch	ap+r	W806 [6	od wit	h G	6 1x3 -
Layer^ Cover*	Height Ra	nge	Dominant :	species*				[Layer: E, 1	[1, T2, T3, S1, S2, G]
<u>s</u>	14-17	)	fuc pia		es ext				
Ta S	2-13		7 9 4	1 Ste	ST.	711.0			the bars and has bars bars bars bars has bar bar bar bar bar bar and bar and bar and an and an and an and bar bar bar bar
<u>St</u>	1.5-2.	5	Lit wa	M Y	ac tw	1 11 2 2	<u>. spo '</u>		
<u> </u>	0-15		Het con,	Siy S	ca* , (3.	r Vag	Alt Ge		
					100 Bin Bir Ini An Jac Jac Jac Bir Bir Bir An I				
LANDFORM	Situation'	*:	Pattern*:		Slope po	sition*: F		Slope an	ngle:
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal}	Texture:			Colour:		1000
Notes:	-			Cle	and -		Dak		
				~			Clover		
DISTURBANCE  Seve	erity/Exter	nt^ Notes	(into source,	fire scar	neight, ti	ime since ev	<u>ent)</u>		
Fire	0	{scorcned	trunk/some	crown a	eath/muc	n crown de	atn}		
Logging / clearing	0	, and has been seen han been bed had out the bar	* /			pr	t han lint hin had han line hin hin hin line line	lan lan lan 199 lop: hot lan lan lan dis	
Non-native plant cover	2.00	2.7 Ma	MA A	2410.					***
Grazing	IW.					an, an an an an an ar in in in the set		ger ger his gik ins his silt in die 200	
Feral diggings	0			an Min bin bill Mil Min All All Min and					
Erosion	0	l que par que san sus las un sal der bas das	nam dana basar basi ang dana dana dana ang dana dana dana d	ng tạp lạp làn the bin tim Mil Mil I	har inst nas ann was mu inst inst ins mu i	eer jaal gel bit. Wil Die Sile die, bis Wil Wil Wi	e has did told the line was not one one one		na an a
Storm	0		ann ann liad ann lan lain ann lan lan laif liad ain 186 i						
Human litter/waste	0	flacting to		formal				pag yan pak kali dan jak kali din din din din	
Intrastructure	0	{building/l	road/tracks/	tence}					
Artificial noise/light	a	{noise/ligr	IT}	nr han han hin Mit Mit die hin hin hin	nak min line nati line lane line lane line line l	liga gan ban laga laka san Tan Bat Mar Ala laka san W	n line and get line me has her line her her her		
Other	-								
(Severity: (0 nil) - 3 (severe): Fx	l tent: Localise	l d (I ) / Widesr	read (W): Info.	Source: Di	irect obs. (#	) / Anecdotal (	@) / Combina	ation (#@)]	
HABITAT CHARACTERISTI	CS - ABUN	DANCE					-//		
Feature	Abundance	e^ - Notes	1		Waterbo	ody: (Marine,	/Estuarine/F	verine/Pa	lustrine/Lacustrine}
Large (>10cm) tree hollow	vs १				Dry/Fillir	ng/Receding/	Unknown or	Neutral}	({Still/Flowing}
Small (<10cm) tree hollow	NS T			nin ang igo, pity jiti kan alin iki kan	(Natural/	Modified}	{Pugging/H	leavy Grazi	ng/Light Grazing}
Fallen logs (>10cm diam.)	3		ine with the last no because on, or, but her had life i	ne die die het vir die die ver het '	{Clear/Tu	rbid/Surface	Film Oil/Sur	face Film O	Prganic}
Course litter (>2cm diam.	14				Notes:				
Fine litter (<2cm diam.)	5				_				
Decorticating bark				ay in. (or 20. in 20. in 20. in 20.	-				
Cryptogam	0				-				
Soil cracks	0								
Stones (20-60cm)	0				<u>Caves:</u>	{Deep/Sh	allow/Overl	nang/Crevi	ces/Boulder Piles}
Boulders (61cm-2m)	0	, go jes 141 ko 16. 161 ko 20 ko 20 m	and the state and state and the state that the state of the	yes and had has had had no bas had	-	M			
Large Boulders (>2m)					Detic -	no lfort 10/1			
Extoliating rock	6				_ <u>nauo gra</u>	a33/10FD (%)	<u>-</u> 70/	30	
Active nowering (1 & 5)	<u>  ~ </u>		ng aja dite nat lain lait pat itti itti itti atti atti atti	and the part life will be part of the part	Ground	cover (%)• A	are Groun	d: Rock · I	litter : live
		t and had any had the line had the sold by un-	we had been an tan tan ing tan tan ya ing ing ing	an an an in in in in at in in	<u>_ Ground</u>	[/0]. D	15	0 : 10	15.
					CWD (50	)m transect	):		
[Abundanca: NEI/A) 4/D-ua) 5/	 Pare / Descala	   2/0	nal) //0'-	nal/Comm		mon) ElCom-		re) 7/46.00	dance)
Site sketch /notos	nare/Occasio		anari, 4(Occasio	nay comm	ion, strom		any Assumudi		
Site Shelling Holes;									

Project number/name:	13503	T Project	location: 4PS2	98 <sup>2</sup>
Site name:		Date: 25/5/2	Obser	vers:
Latitude: _19.796992	Longitude	e: Datum: 700 WSG84	Photos: North: East:	South: 54 West: 56
VEGETATION RE (as mapped): (1-3.4)	11.3.25/	11.3.13 11.3.256 RE (obs	erved): 11.3.4	
General vegetation descri	ption:	fue pla dominated	woodend	with Cartes.
Samo	Q S	RE- 12 5 Mor	e grass >>	Pan sp & Aru Sp.
Layer^ Cover*	Height Ra	nge Dominant species'	. has	[Layer: E, T1, T2, T3, S1, S2, G]
-71 S	6-17	FUC PIU LI	O A GA. ALL	Ara Pla tur
S S-M	1.5-2	1 it Main	CAU GIG*	**************************************
6 0	0-1.5	All Cice	hes shar. Asc	sp.", Cliter" Ociame" Vie lob"
		Ure most p	an sp Acu	
		w	that and has that has had they like his top gas but him pix, but him him the time	-
	iĝi ĝint-tilo, ĝint-filo que (12) ĝint pol-filo lint-t	***************************************		
LANDFORM	Situation <sup>4</sup>	*: Pattern*:	Slope position*:	Slope angle:
SOIL (topsoil)	Depth: {D	eep/Shallow/Skeletal} Texture		Colour:
Notes:		Cla	9	Grey/ Blown
DISTURBANCE Seve	erity/Exter	nt^  Notes (info source, fire sca	r height, time since	event)
Fire	0	{scorched trunk/some crown of	leath/much crown	death}
Logging / clearing	0			
Non-native plant cover	3W			
Grazing	300			
Feral diggings	0			
Erosion	0			
Storm	0			
Human litter/waste	0			
Infrastructure	16.	{building/road/tracks/fence}	a ang agu juu dan dan dad dah dan dan dat dati dati dati dati dati dati dati	
Artificial noise/light	<u></u>	{noise/light}		
Other	-			
[Severity: (0 nil) - 3 (severe); Ext	l ent: Localise	 :d (L) / Widespread (W); Info. Source: [	irect obs. (#) / Anecdot	al (@) / Combination (#@)]
HABITAT CHARACTERISTI	CS - ABUN	DANCE		· · · · · · · · · · · · · · · · · · ·
Feature	Abundance	e^ - Notes	Waterbody: {Mari	ne/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	vs (		{Dry/Filling/Recedin	g/Unknown or Neutral}   {Still/Flowing}
Small (<10cm) tree hollow	vs S	t has het met het hat has an an an dat het het het het sep het het het het het het het dat het het het het het het het het het he	{Natural/Modified}	{Pugging/Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	<u> 3</u>		{Clear/Turbid/Surra	ce Film Oil/Surface Film Organic}
Course litter (>2cm diam.			Notes:	
Pine inter (<2cm diam.)				
Cryptogam				
Soil cracks	0	·		
Stones (20-60cm)	0		Caves: {Deep	/Shallow/Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0		N 987	
Large Boulders (>2m)	0	(2) Yes the base the same same same same same same same sam	4 km	
Exfoliating rock	6		Ratio grass/forb (	<u>%):</u>
Active flowering (T & S)				40/00
Other			Ground cover (%)	Bare Ground : Rock : Litter : Live
			CWD (50m transe	ect):
[Abundance: Nil(0) 1(Pare) 2/6	 lare/Occasio	 nal), 3(Occasional), 4(Occasional/Com	non), 5(Common), 6(Co	mmon/Abundance). 7(Abundance)
Site sketch/notes:				

Project ñumber/name:	1350	37	Proje	ect location:	HPS2		
Sita name:			Date: 5/5/21		Observers:	N.	
Latitude:	Longitud	e:	Datum:	Photos:	North:	South: ~	
VEGETATION	1.256				3.756	west. sz	
RE (as mapped):			RE (ot	oserved):	0 000		
General vegetation descr	iption: M	lel len,	l Lop gra	ting.g	a W	atercalise.	
Layer^` Cover*	Height Ra	ange	Dominant specie	:S*		[Layer: E, T1, T2, T3, S1, S2, G]	
<u>M</u>	18-22	t Martin 1992 And Ang Mary San Tura yang Sali dang San San San San San 1993 And Ang Mary San Tura yang Sali dang San San San San San	Mel Ien,	ner fin,	Lop gra	, lor tes,	
12 2	6-12	i ina ina ina' ina ami ina' ina ina ana ana ana ana	TI 50P + -1	c app, u	or inc.		
<u>s</u>	2-5		Von an",	lon cam			
D	0-1-5		_MegMax_,.	<u>417 26</u>	, Sipo ja	c. , Age con , Uid Sp.	
	Situation	*•	 Pattern*:	Slone nosi	tion*•	Sione angle:	
		B	LP		F		
<u>SOIL (topsoil)</u>	Depth: {D	eep/Shallow/S	Skeletal} Textu	re:	Cc	blour:	
Notes:				Scray		Ten	
DISTURBANCE Seve	erity/Exter	nt^  Notes (ir	nfo source, fire so	ar height, tim	e since even	t)	
Fire	<u> </u>	{scorched tr	unk/some crowr	death/much	crown death	ו}	
Logging / clearing	0		ann aine anns aice anns anns anns anns anns anns anns ann	h lite bot no. has was was was any machine dant this the gay p	- Nor has been been has been had been and		
Non-native plant cover	1.10						
Grazing	1w				n ann ann ann llais inti dais jité inte ann par llais pais in	***	
Feral diggings	0						
Erosion	0				0 00		
Storm	0						
Human litter/waste	0						
Infrastructure	Õ	{building/ro	ad/tracks/fence				
Artificial noise/light	0	{noise/light}	••••••••••••••••••••••••••••••••••••••				
Other		Luunuder Suud	tin ta, jon lay, ina go, jon yo lab ita kin kin kin kin kat ka kat k				
[Severity: (0 nil) - 3 (severe); Ext	 :ent: Localise	 d (L) / Widespre	ad (W); Info. Source	: Direct obs. (#) /	Anecdotal (@)	/ Combination (#@)]	
HABITAT CHARACTERISTIC	CS - ABUN	DANCE					
Feature	Abundance	e^ - Notes		Waterbod	y: {Marine/Est	tuarine/Rivering/Palustrine/Lacustrine}	
Large (>10cm) tree hollow	vs R			{Dry/Filling/	Receding/Unk	nown or Neutral}   {Still/Flowing}	
Small (<10cm) tree hollow	vs 4			{Natural/Mo	odified}   {P	ugging/Heavy Grazing/Light Grazing}	
Fallen logs (>10cm diam.)	4			{Clear/Turbi	d/Surface Filn	n Oil/Surface Film Organic}	
Course litter (>2cm diam.	1.6			Notes:			
Fine litter (<2cm diam.)	6						
Decorticating bark	6						
Cryptogam	ă.						
Soil cracks	Ŏ						
Stones (20-60cm)	1			Caves:	{Deep/Shallo	w/Overhang/Crevices/Boulder Piles}	
Boulders (61cm-2m)	ð						
Large Boulders (>2m)	0						
Exfoliating rock	0			Ratio grass	/forb (%):	Solio	
Active flowering (T & S)							
Other				Ground co	ver (%): Bare	e Ground : Rock : Litter : Live	
					3	0:0:15:55	
				CWD (50m	transect):		
[Abundance: Nil(0), 1(Rare), 2(R	are/Occasio	nal), 3(Occasiona	al), 4(Occasional/Cor	nmon), 5(Comma	n), 6(Common/	Abundance), 7(Abundance)	
Project number/name:	13503	7	Project loc	ation:	HPS2		
---	---------------	---	--	--	---	--	--
Site name:		Date:	March 195		Observe	rs:	
re-ra			28/8/24			RW.	
Latitude:	Longitude	2: Datum	: Ph %ች	otos:	Fast: 20	West:	48
VEGETATION	11 3 25	11 3 13/11-3 25	1		1.3.14	ų	
RE (as mapped): General vegetation descri	ntion:		RE (ODSERVE	a): <u>v</u>	(10 00)	1	and C intell
doninated by	non-nal	eve pia di Nue spp	minated	we h	n (s	x 403 3	s and Ge legars
Layer^ Cover*	Height Ra	nge Domin	ant species*	· Le e		[Layer: E	, T1, T2, T3, S1, S2, G]
<u>-11 \$</u>	16-	io eri	Dia Ca	A CA COL	A 4 5 -	nen Ala Ka	4
C Serva		* 1 7:4	Press for here	A BEA	4 <u>133.57</u> . 4		
- <u>6</u> 0	Q ~1	S AH	Gg: Mes.	<u>)</u> 5,74*,	Asco	s", cliter, C	Xiane Use lobs
LANDFORM	Situation	*: Patter	n*: Slo P	ope posi	tion*: F	Slope	angle:
SOIL (topsoil)	Depth: {D	eep/Shallow/Skeleta	} Texture:			Colour:	
Notes:			Clay			Graybanen	
DISTURBANCE Seve	erity/Exter	nt^  Notes (info sou	rce, fire scar hei	ight, tim	e since ev	ent)	
Fire	0	{scorched trunk/sc	me crown deat	h/much	crown dea	ath}	
Logging / clearing	0	t, han me met mit han bes im han han han han jak per bes had bin van bin bin ser ber				ten hat has been het het die als nie als die die het het die	n an
Non-native plant cover	<u>3w</u>						***************************************
Grazing	JW.					***	
Feral diggings	0			ana ang ang aike sair teon pen digi bi	h bier des Alle Mid Gill. Die Mill Mill Mill Mill		
Erosion Management of the second seco	0		na pad pad ang	1. M. M. S. S. S. S. M. S. S.	. In. In. we we see on we see on the	man man ban ban ban man baha ban bani 1920 1920 1920 1920 1920 1920 1920 1920	in had may had may may may may had had may
Storm	Ģ						
Human litter/waste	0					gen has bee het het het het die alle alle alle alle alle per het per het per het het die alle alle a	
Infrastructure		{building/road/tra	cks/fence}	he d			
Artificial noise/light	<u>a</u>	{noise/light}	na, and and the law that the line line line are also bee line has been line.		n gagi agn ynt jan jan din blêt tin, ban bak		
Other	Olympic .						
JSeverity: (0 nil) - 3 (severe): Ext	ent: Localise	 od (L) / Widespread (W):	Info. Source: Direct	obs. (#) /	Anecdotal ((	@) / Combination (#@	)]
HABITAT CHARACTERISTIC	CS - ABUN	DANCE		0.001 (1177			
Feature	Abundanc	e^ - Notes	W	aterbod	y: {Marine/	/Estuarine/Riverine/I	Palustrine/Lacustrine}
Large (>10cm) tree hollow	VS AL		{Di	ry/Filling/	Receding/L	Jnknown or Neutral)	{Still/Flowing}
Small (<10cm) tree hollow	vs 💎		{Na	atural/Mo	odified}	{Pugging/Heavy Gra	zing/Light Grazing}
Fallen logs (>10cm diam.)	3	t mer han man men men men han men han ben hen hen hen hen hen hen hen hen hen h	{Cl	ear/Turbi	id/Surface I	Film Oil/Surface Film	Organic}
Course litter (>2cm diam.	) 5		No	tes:			
Fine litter (<2cm diam.)	5			6-1-1	•		
Decorticating bark	2		10, 10, 10, 00, 00, 10, 10, 10, 10, 10,	N	<b>₩</b> -		
Cryptogam	0						
Soil cracks	0				4- 441		
Stones (20-60cm)	6		<u>Ca</u>	ves:	{Deep/Sh	allow/Overhang/Cre	vices/Boulder Piles}
Boulders (61cm-2m)		i ) har iyo lagi kun kun kun kul kin kun ili. Kun kin kin kin kin kin kan kan kun kun kun kun kun k	ener bes, bes, bis, star his bab his har his his his his bir	N	A-		
Large Boulders (>2m)	0		Ra	tio grass	s/forb (%)	:	
Active flowering (T & S)						- 5/43 -	
Other			Gr	ound co	ver (%): B	are Ground : Rock	: Litter : Live
			CV	VD (50m	transect)		
[Abundance: Nil(0), 1(Rare), 2(R	lare/Occasio	nal), 3(Occasional), 4(Oc	casional/Common),	, 5(Commo	on), 6(Comm	ion/Abundance), 7(Ab	undance)
Site sketch/notes:							

Project number/name:	13503	7	Proj	ect location:	4952	
Site name:			Date:		Observers:	
RE-13		<u>ì</u>	25/5/21		en	
Latitude:	Longitude	8:	Datum:	Photos:	North: 16	South:
-14.803036	147 u	18589	WS684		East: 444	West: 42
VEGETATION	de service		DC /-	·	274	
RE (as mapped): 11 5	256		KE (O	bservea):	3.010	<b>A</b>
General vegetation descri	iption:	phet lew	1 D. Lop	Ara cipo	Him Vez	retation proging
watercourse				<b>V</b>	v	
Layer^ Cover*	Height Ra	ange	Dominant specie	es*		[Layer: E, T1, T2, T3, S1, S2, G]
M IT	16-	- 22	Mel les	Lor gra	( Me) Liu	<u>, Lor 123</u>
-12 5	6-1	12	TI 522 / 1	66 608 - 1	pac ne	
<u>s</u>	<u>~</u>	3	Yon pun	the second	AM ¥	
<u> </u>		1.5	Meg May	Aru sp		po jac', ke con',
	Situation	*.	Dattarn*:	Slone nos		Sione angle:
	Situation	B	Pattern .		<u> </u>	
SOIL (topsoil)	Depth: {D	eep/Shallov	v/Skeletal} Textu	ire:	Colo	our:
Notes:			S	sendy	T	FAL
	1.00 A.			~		
DISTURBANCE  Seve	erity/Exter	nt^ Notes	<u>(info source, fire s</u>	<u>:car height, tim</u>	<u>ie since event)</u>	L
Fire	0	{scorched	trunk/some crow	n death/much	crown death}	
Logging / clearing	0	5	a lan an inc inc as an an inc inc inc an inc inc an inc as an inc as	ar (ga, bar (of the jor top top (or )or the) out off of the .		
Non-native plant cover	1 100					
Grazing	100				10 <u>CAR</u> CO /	
Feral diggings	6					
Erosion	B			, and we have have been dies the this days have have him will be have be		<i></i>
Storm	194	The line has the first for the line state for the	mm and, and have the man and has been have been have been have been	) and find the last first has been for the last first	ar na ma na na na na ha ha na na ma ma na ha na h	
Human litter/waste					up più ari dan per lano lan dan sia ini dan dai bia dia dia dia di	
Infractructura		/huilding/	road/tracks/fence			
A mificial naica/light		Innica/ligh	Way a actor inter	:/		
	- Selaman	{11015e/1161	113	n dan lam lam lam lam and lam lam and lam lam lam lam lam lam lam l	$\alpha_{\rm e}$ this lash both likes into their lash limit lines like into their Versili	
Otner	-Willipher Paleer					
/ /Severity: (0 nil) - 3 (severe); Ext	l tent: Localise	d (L) / Widesr	oread (W): Info. Sourc	:e: Direct obs. (#) /	Anecdotal (@) /	Combination (#@)]
HABITAT CHARACTERISTI	CS - ABUN	DANCE				
Feature	Abundanc	e^ - Notes		Waterbod	v: {Marine/Estu	arine/Riveribe/Palustrine/Lacustrine}
Large (>10cm) tree hollow	MC "3	Ī		Dry Filling	/Receding/Unkn	own or Neutral}   {Still/Flowing}
small (<10cm) tree hollow	AIC 1.			(Natural/M	odified}   {Pur	gging/Heavy Grazing/Light Grazing
Fallen logs (>10cm diam.)	1			{Clear/Turb	id/Surface Film	Oil/Surface Film Organic
Course litter (>2cm diam				Notes:	idy out the comment	on/ourreet e.g,
Eine litter (22cm diam)						
Pocorticating bark	<u> </u>	) and the first state and the second state and the second		·····		
Compagement		. S has not not been use has use how one put	r an ind law (na ina ina ina ina ina ina ina ina ina i	a lan. Inn lan, ipp.		
Cryptogani Coil crocke						
Stance (20 Shem)		-	a man mana mana mana mana mana mana man	Caves.	(Doon/Shalloy	(Overhang/Crevices/Roulder Piles)
Stones (20-ouchi)			r ble for met som for men om om om verk som ten, for Øre Øfe Øfe. Die Offe	<u>Laves.</u>	(Deep/snanow	//Overliding/Crevices/Bounder Faces
Bondels (prcm-711)	<u> </u>		) was not out one, one have not out one one have how how how hits hits had one, have	a had has has has		
Large Boulders (22m)	<b>Q</b>			Datio grac	-16h (0/).	
Extoliating rock	<b>4</b> .7		, the Jon ph. pint test Jon, Int Jon pas Joh Jon III. III. III. III. III. III. III. II	Kalio gras	5/TOPD (70].	90/10
Active flowering (1 & 5)	And the second s	. " I have spin tight time state state spin series time gave spin		Currying or	(0/). Dara	Cound - Deale - Little - Line
Other		p	r han bag dad had lind ann bhi lipe ban din dill bill bill bill bill bill bill bill	Ground co	ver (%): Bare (	2010 : KOCK : LITTER : LIVE
				CW/D (50m	transect):	
	- /0	 			1 closence //	
(Abundance: NII(U), 1(Kare), 2(m	(are/Occasion	nal), 3(Occasio	onal), 4(Occasional/ co	immon), s(comine	on), b(Common/A	bundance), /(Abundance)
Site sketch/notes:						

Project number/name:	13503	Project location: HRS2
Site name: RE-14		Date: 25/5/21 Observers:
Latitude: -19.804657	Longitude 147 · 1	: Datum: Photos: North: 31 South: 40 10576 WSG 1 East: 41 West: 42
VEGETATION RE (as mapped): いっろいや	111.3.2	/11.3.13/11.3.256 RE (observed): (1.3.4
General vegetation descri	ption:	or tes dominated woodland with Gor cla.
G and S layer	rs do	ninated by non-native spp
Layer^ Cover*	Height Ra	nge Dominant species* [Layer: E, T1, T2, T3, S1, S2, G]
TI S	16 - 2	O Gr tes, Cor cia, cat pio, Lop gra
		(v)
T <u>1 V</u>	<u> </u>	L TI Sep, My Krug Tik time
sj	2-1	4 217 Mase 3, Myo acu
G	and have have have have have have have have	Het con, AIF GC." Mac lat" file swa" oci ama".
		Cro gor * Sid acut
LANDFORM	Situation	* Pattern*: Slope position*: Slope angle:
	Situation (	3 UP
<u>SOIL (topsoil)</u>	Depth: {D	eep/Shallow/Skeletal} Texture: Colour:
Notes:	All shares of the	Clay. Oberna
DISTURBANCE Seve	erity/Exter	t^  Notes (info source, fire scar height, time since event)
Fire		{scorched trunk/some crown death/much crown death}
Logging / clearing		
Non-native plant cover		
Grazing	1.10	
Feral diggings		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Frosion	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Storm		
Human litter/waste	8	
Infrastructure	~	{building/road/tracks/fence}
Artificial noise/light	0	l{noise/light}
Other	- tare has been been been been been been been	
[Severity: (0 nil) - 3 (severe); Ext	tent: Localise	d (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]
HABITAT CHARACTERISTI	<u>CS - ABUN</u>	DANCE
Feature	Abundance	A Notes Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	vs y	{Dry/Fining/Accoung/Onknown of Neutral   [Stin/Fiowing]
Small (<10cm) tree hollow	vs 3	{Clear/Turbid/Surface Film Oil/Surface Film Organic}
Course litter (>2cm diam		Notes:
Fine litter (<2cm diam )	( <b>)</b>	N/A
Decorticating bark		
Cryptogam	3	
Soil cracks	Ő	***************************************
Stones (20-60cm)	6	Caves: {Deep/Shallow/Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	6	N44 /
Large Boulders (>2m)	0	
Exfoliating rock		Ratio grass/forb (%): 40/60
Active flowering (T & S)	-40005	
Other		Ground cover (%): Bare Ground : Rock : Litter : Live
		CWD (50m transect):
[Abundance: Nil(0), 1(Rare), 2(F	l Rare/Occasio	nal), 3(Occasional), 4(Occasional/Common), 5(Common), 6(Common/Abundance), 7(Abundance)
Site sketch/notes:		

Project number/name:	13503	7	Proje	ect location:	HPS2		
Site name:			Date: 25/5	121	Observe	ers:	
Latitude:	Longitude		Datum:	Photos:	North: 7	<b>1</b> Sou	ith 14
-19 8137-1	147.11	6777	wsGr84	FIIOLOS.	East: 2	9 W	est: <b>3</b> 0
VEGETATION RE (as mapped): 11.3	7/11.	39	RE (ot	served): 11	3.9.		
General vegetation descri	iption:	· - ola	00.40	wood	1000	pin C	or his
-	. (	euc pla	CP	an albert defa antiple differ			
Layer^ Cover*	Height Ra	nge	Dominant specie	es*		[La	yer: E, T1, T2, T3, S1, S2, G]
71 2	14-18		Eac pia 1	Cui Tej			
	6-1		1 000		and band that that band bill, blass that state, bill beer in	an haat haad hee dhat hee dhay gan ping man and and han was had be	
Lalatet	- D - 1-						
SI M	2-3		Zit Mars	*. Pas a	CU <sup>16</sup>		
		~~~~~~~~~~			ne per sus una lane and mer land and land land level		
<u>6</u> D	0-1		Hat CON,	Die Ser	, pan	SP., Alt	Cie*, Sty ham,
							<b>*</b>
	Situation	*.	Pattern*:	Slope nos	sition*:	Slo	ope angle:
PROTONI	Situation	&	4J	otobe bee	F		
SOIL (topsoil)	Depth: {D	eep/Shallow/	Skeletal} Textu	re:		Colour:	
Notes:	- North Street Street			any,		Den.	
DISTUDDANCE	in de		fo course fire o	V holisht tir		( Storet)	
DISTURBANCE Seve		Scorched tr	upk/some crow	<u>car neight, tir</u> n death/much	ne since ev a crown de	ath}	
logging / clearing							
Non-native plant cover	1.3	a maa kan maa kan kiin kiin, kun joo, koo ijoo pili ilio, ku	n mar ben die der eine bas die	ins, was not los: on, ins los los hill bill bill line ins had line i		te we and his last her has been provided but the time and hill had	
Grazing					per alla più dan ille ille dan die alle die die die die die die die die die di		
Feral diggings	6				an a	n 19 29 29 19 19 19 19 19 (a m m m m m m m	
Erosion	0			ne ou us in pr his in in air air an an an an an an an a			
Storm	6	in the same and the same that has been been been been been been	a, maa maa maa maa maa kayo joo, maa iyo, kaad gool kaal kayo joop kind kini. Isoo		mer vann ann, hanc land land han, had han hall han d	in the test life life life life life life life life	
Human litter/waste	0						
Infrastructure	0	{building/ro	ad/tracks/fence	}			
Artificial noise/light	G	{noise/light	}				
Other	Adama						
				<b>D</b> (1)	( • · · · · · · · · · · · · · · · · · ·		(40)
[Severity: (0 nil) - 3 (severe); Ext	tent: Localise	DANCE	ead (W); Into. Source	2: Direct obs. (#)	/ Anecdotal	(@) / Combination	(#@)]
Feature	Abundanc	eA - Notes		Waterbo	<b>dv:</b> {Marine	/Estuarine/River	ine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	NS 2			{Dry/Filling	g/Receding/	Unknown or Nei	utral}   {Still/Flowing}
Small (<10cm) tree hollow	NS LI-	a ma ha mu mu an an an an an an da da ha ha		{Natural/N	/odified}	{Pugging/Heav	y Grazing/Light Grazing}
Fallen logs (>10cm diam.)			n lạn hạo gọi lận han học tác lạn bặc bải hái đãi đãi đãi đãi bởi lớn bơn	Clear/Tur	bid/Surface	Film Oil/Surface	Film Organic}
Course litter (>2cm diam.	) 4			Notes:			
Fine litter (<2cm diam.)	5			0/	Δ		
Decorticating bark				·V	*		
Cryptogam	6						
Soil cracks	0	) and and and and and set one pair the pair the set			10 101		
Stones (20-60cm)	6		nn ann ann ann ann ann ann ann ann ann	<u>Caves:</u>	{Deep/Sł	nallow/Overhang	//Crevices/Boulder Piles}
Boulders (61cm-2m)	<u> </u>	i gar gar gar ann bar ion ann bail bhi ban bill bhi b	n ike ku, kat ike kat ike ke ke ke an ter uit ou ter te te te	ani ina ina tao tao.	NA.		
Large Boulders (>2m)	<u>6</u>			Ratio gra	ss/forh (%	)	
Active flowering (T & S)	Acade				33/1018 1/0	- Jo/10	,
Other			20 100 100 100 100 100 100 100 100 100 1	Ground c	over (%): L	Bare Ground : F	Rock : Litter : Live
		. ya, na, na, na na ma na ina ina ina ina ina ina ina ina ina	p. per app top. An. Bel Will have Mil. half bed Mil. and have Mile Mile Will wa	ten, les les les		15:0:	10:15
				CWD (50	m transect	):	
[Abundance: Nil(0), 1(Rare), 2(F	ہ Rare/Occasio	nal), 3(Occasion	al), 4(Occasional/Co	mmon), 5(Comn	non), 6(Comr	non/Abundance),	7(Abundance)
Site sketch/notes:							
1							

Project number/name:	3503	Project location: 4PS2.
Site name: RE-16		Date: 25/5/21 Observers: 25/5/21 RW.
Latitude: -(4, 120743	Longitude	Datum:         Photos:         North:         7         South:         9           32 7676         3256 %         East:         11         West:         20
VEGETATION RE (as mapped):	2.1	RE (observed):
General vegetation descri	iption:	the str. For alle and free Mit Mirod opa
woodland. Non	i- (em)	nant.
Layer^ Cover*	Height Ra	Inge Dominant species* [Layer: E, T1, T2, T3, S1, S2, G]
	<u> </u>	
<u>S</u>	2-4	Ere mot, ziz Man, Cry gra
<u>6</u> D	0-1	Het can, Pan sp. , Chiter", Att fit", Shy Sca", Shy ham", Chi int"
LANDFORM	Situation	*: Pattern*: Slope position*: Slope angle:
SOIL (topsoil)	Depth: {D	Deep/Shallow/Skeletal} Texture: Colour:
Notes:		May - Durk brown
DISTURBANCE Seve	erity/Exter	nt^  Notes (info source, fire scar height, time since event)
Fire	0	{scorched trunk/some crown death/much crown death}
Logging / clearing	3W	
Non-native plant cover	114	
Grazing	IW	
Feral diggings	0	
Erosion	0	
Storm	0	
Human litter/waste	0	
Infrastructure	14	{building/road/(racis/fence}
Artificial noise/light	I L	{filise/light}
Other		
	-	
[Severity: (0 nil) - 3 (severe); Ext	tent: Localise	d (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]
HABITAT CHARACTERISTIC	<u>CS - ABUN</u>	DANCE
Feature	Abundance	e^ - Notes Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollov	NS	{Dry/Filling/Receding/Unknown or Neutral}   {Still/Flowing}
Small (<10cm) tree hollov	NS Q	{Natural/Modified}   {Pugging/neavy Grazing/Light Grazing/
Fallen logs (>10cm diam.)	<u>Z</u>	
Course litter (>2cm diam.	1 1	Notes:
Fine litter (<2cm alam.)		
Decorticating Dark	<u> </u>	
Son cracks	U	Caves: {Deen/Shallow/Overhang/Crevices/Boulder Piles}
Roulders (61cm-2m)	<i>G</i>	
Large Boulders (>2m)	- <u>Q</u>	
Exfoliating rock		Ratio grass/forb (%):
Active flowering (T & S)		65 / 55
Other		Ground cover (%): Bare Ground : Rock : Litter : Live
		<u>CWD (50m transect):</u>
[Abundance: Nil(0), 1(Rare), 2(R	Rare/Occasio	nal), 3(Occasional), 4(Occasional/Common), 5(Common), 6(Common/Abundance), 7(Abundance)
Site sketch/notes:		

Project number/name:	13503	Project location: HP52.
Site name: $PE = 17$	(Rapist.	ade). Date: Observers: Ew.
Latitude:	Longitude	Datum:         Photos:         North:         South:         12           7. V 3 2702         W6G 84         East:         3         West:         14
VEGETATION RF (as mapped): [[ [2	.1 (re	growth) RE (observed): Non - Tem
General vegetation descri	iption:	is a superior along the advantaged according
No shrub or	tra.	Non-remnant voyetation along on oppears an ordered
Layer^ Cover*	Height Ra	ange Dominant species* [Layer: E, T1, T2, T3, S1, S2, G]
G- D	0-1.5	Pan soy Alt lie; Xan pun " Cy you " Cliter"
		Bot pet, Dig sp (?), Eat rom
***************************************		
);		***************************************
		* Dutun * Olana un tatau * Clava anala
LANDFORM	Situation	*: Pattern*: Slope position*: Slope angle:
SOIL (topsoil)	Depth: {D	eep/Shallow/Skeletal} Texture: Colour:
Notes:		Class Date
		- sum
	anter / Exchan	ntAl Netes (info source fire corr height time since event)
DISTORBANCE [Sev	erity/Exter	T
Fire	<u> </u>	{scorched trunk/some crown death/much crown death}
Logging / clearing	3.0	A the Boundary .
Non-native plant cover	211	
	DW.	
Grazing	210	
Feral diggings	0	
Erosion	0	
Storm	6	
Human litter/waste	0	
Infracting		[huilding/road/teache/fance]
mirastructure		
Artificial noise/light	Ø	
Other	-	
(Severity: (0 nil) - 3 (severe): Ex	tent: Localise	d (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]
	CC - ARLIN	DANCE
	L.	DAINCE
Feature	Abundanc	<u>e^ - Notes</u> <u>waterbody:</u> {Marine/Estuarine/Ryterne/Palustrine/Lacustine}
Large (>10cm) tree hollow	vs O	Ury/Hilling/Keceding/Unknown or Neutral}   {Still/Howing}
Small (<10cm) tree hollow	NS Ø	{Natural/Modified}   {Pugging/Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	0	{Clear/Turbid/Surface Film Oil/Surface Film Organic} NA
Course litter (>2cm diam.	) 14	Notes: WC-10.
Fine litter (<2cm diam )	1 1	(iær) As
		US -015 @ 4#11
Decorticating bark	<u> </u>	"Hym amp"
Cryptogam	0	a tis mart US-pt
Soil cracks	0	
Stones (20-60cm)	6	Caves: {Deep/Shallow/Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0	
Large Boulders (>2m)		
Eufoliating rack	. O	Ratio grace /forh 1%)
Exfoliating FOCK		<u>nalio glass/ ioi b 1/0/.</u> \$6/50
Active flowering (T & S)		
Other		Ground cover (%): Bare Ground : Rock : Litter : Live
		10 0 5 35
		CWD (50m transect):
Cohundonan stilles almost al	 	 val) 2/Occasional //Occasional/Common ElCommon / ElCommon / Abundanca) 7/Abundanca)
Abundance: NII(U), 1(Kare), 2(I	nare/Uccasio	אמון, אראאמונגאין אראאמונגאין אראאמונגאין אראאמוניאין אראאמוניאין אראאמוניאין אראאמוניאין אראאמוניאין אראאמוניא
Site sketch/notes:		

Project number/name:	13503	i sont	Project loca	tion:	HPS2	1.0			
Site name:		Date:	-1+ 121	(	Observers	5 0.N			
RE-18		2	5/5/21			have		54	
Latitude:	Longitude	: Datum:	Phor	tos: N	North: 23	1	South: 24		
-19.813000	147 1257	103 W348	4-	E	East: 25		West: 26		
VEGETATION RE (as mapped): 11-3	7 / 11 3	9	RE (observed)	): 11 ·	3.7				
General vegetation descri	iption:	ar dat dow	sical of	naa .	. Withors and	Hom of	a k Ma	evidence	CL
cloaring		D. Dat Con	Hartis of	f see a se	Profile Spinsters and an	'(*** <i>U</i>		an a g dha an aidhean	294: <u>\$</u>
Layer^ Cover*	Height Ra	nge Dominar	nt species*				[Layer: E, T1, 1	T2, T3, S1, S2, G]	
TI V	12-14	<u> </u>	del						
<u> </u>	0-6		Qal *		lik. Nić dat jer jec me me me me me		na lan ana ina ina' kis' kat ina ina' (n. 166 (n. 167 (n.	i bigi liyo piya pina marami ana ana kuri kuni kuni pina kuna marami	
<u>SI 5-M</u>	2-4	<b></b>	Mars		A.4. (		r hurañ		
<u>&amp; D</u>	<u>Q-1</u>	H41	Cent CMI	-iAł	AIC H	10-1-2	Hy MANA		
							ng dara mang ning dang dang pang pang ditik dana mili jiku dati d		
LANDFORM	Situation*	': Pattern*	: Slop	e positic	on*: F		Slope angle		
<u>SOIL (topsoil)</u> Notes:	Depth: {De	eep/Shallow/Skeletal}	Texture:		C	olour:			
DISTURBANCE Sev	erity/Exter	nt^  Notes (info sour	ce, fire scar heig	ht, time	since eve	nt)			
Fire	0	{scorched trunk/son	ne crown death/	/much cr	rown deat	th}			
Logging / clearing	2.47	Chard Pol 10	120 50 1	LAIE .	Sout	-100 1	roos les	na. 129 .	
Non-native plant cover	900	GASIG	and determinent that we may	A Paperson		in m in m or er or er m -		V	
Grazing	141		-yes-x				ge Ree 100 Gin 200 AN AN AN AN AN AN AN AN AN		
Foral diggings	G					an ang agin law dan jali dan akin din din aki ang a			
Frosion	6		t and diff has has had had had had did did by any and bot for any	na, ha ha lin lin an do ar an an an	ten (m.) may mir dyfi Mir Mal Mir Mir Mir um				
Storm	0	may may may may have beer beer been may have beer beer, into 10th, half 10th bills bird 10th 10th 10th 10th 10th	$\varphi$ (eq. and that that that that that the fact has the fact the set of the low	per (bel lake fan 180 die 180 die 180 die 1			ar his and any size are set bit. We have be set are		
Human litter/waste	0								
Infrastructure		{building/road/traci	s/fence}	swer	Vine				the second se
Artificial noise/light	1 M f	{naise/light}	Ded A dy	61 676		n an ar an an An An An An An An			A set of the law law law law like his set.
Other			and the last of the last the set of the constant of the last of th	an a	Weige ma lain mpa pun hype blar han han han han han			, and have been been been been been been been be	A not had the fire has had bee ble fire we -
		1							
[Severity: (0 nil) - 3 (severe); Ex	tent: Localise	d (L) / Widespread (W); In	ifo. Source: Direct of	obs. (#) / Ar	necdotal (@	) / Combina	ation (#@)]		
HABITAT CHARACTERISTI	CS - ABUNI	DANCE							
Feature	Abundance	e^ - Notes	Wat	terbody:	{Marine/E	stuarine/R	iverine/Palus	trine/Lacustrine}	
Large (>10cm) tree hollow	ws		{Dry/	/Filling/Re	eceding/Ur	hknown or	Neutral}	{Still/Flowing}	
Small (<10cm) tree hollow	ws 2	To the star and any star and the star and and part of the star and	{Nati	ural/Moa	lified}   {	Pugging/H	eavy Grazing/	/Light Grazing}	
Fallen logs (>10cm diam.)	<u>)</u> /	Dead trees	{Clea	ar/Turbid/	/Surface ⊦ıı	lm Oil/Sur	ace Film Orga	anic}	
Course litter (>2cm diam.	:) <b>!;</b> !		Note	es:					
Fine litter (<2cm diam.)	<u></u>		_ = = = = = = = = = = = = = = = = = = =	NA	6				
Decorticating bark	<b>.</b> []	r , ban lain, lan, lan, lan, lan lain jah ikli ikli ikli ikli ikli ikli ikli ikl			~				
Cryptogam	<u> </u>								
Soil cracks	<u> </u>		Cav	1	(ana /chal	"/Overt	/Crowices	(Devider Dilec)	
Stones (20-60cm)			<u>Lav</u>	<u>es:</u> ι	{Deep/snar	llow/overn	lang/Lievices	/Boulder Files;	
Boulders (orcm-5111)		er bler bler men han bler ble men som men han att han b	m som blet som ätte bålt, böt, blet bad bas bäll bän för		NA .				
Large Boulders (>2m)	<u> </u>		Rati	in grass/	forh (%);		1		
Active flowering (T & S)			A 10 10 10 10 10 10 10 10 10 10 10 10 10	IC Bruce,		75	125		
Other		ر هر چې ون که اوه که او چې وې ها ها وه وې وې وې وې وه او	Gro	and cove	er (%): Ba	re Ground	d : Rock : Litt	ter : Live	
		) tan lad un bug un tas hai las jud ips las hai hit hit hit his bis an un un un im bu bu	p ing ge in his in he in his in his in his		<u></u>	S 10	25	40	
			CW	D (50m t	ransect):			£	
(Ahundance: Nil/0), 1(Rare), 2(	Pare/Occasio	 nal\_3/Occasional 4(Occi	scienal/Common), 5	-/Common	6(Commo	 Abundan	🛲 re). 7(Abundar	nce)	
Cito chotch/notes:	Adiey Colours		Sionaly sectors ,	100	<u>,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, </u>	1973-		1007	
Site Shelling notes.									

Project number/name:	135037	Project loc	ation: 4052.
Site name: RE _ 19		Date: 25/5/21	Observers: RW, PB
Latitude: _19.%23273	Longitude: (UI (3318)	Datum: Ph	iotos: North: 7 South: 8 East: 7 West: 10
VEGETATION			Non-Cent
RE (as mapped): 11-10-	intion	RE (observer	
deneral vegetation described of a constraint of the constraint of	nd.	t, fuc pla on	id the mit non-remanant
Layer^ Cover*	Height Range	Dominant species*	[Layer: E, T1, T2, T3, S1, S2, G]
TI S	8-10	Gre str, fue p	la, ER Mit
A; C	9-1:	n 1	A. Mail & Ica ata*
51 5	1-4	Erc. Mity.	12 marce, Og yrss
<u> </u>	0-	Let con, Panse	. Cliter, Alt (K Sty Sca , Sty ham; Cal in [*
LANDFORM	Situation*:	Pattern*: Slo Lf	ope position*: Slope angle:
SOIL (topsoil)	Depth: {Deep/Shall	ow/Skeletal} Texture:	Colour:
Notes:		Chy.	bow
	erity/ExtentA Note	as linfo source, fire scar he	ight, time since event)
Fire	I A Iscorche	d trunk/some crown deat	h/much crown death}
Logging / clearing	2		
Non-native plant cover	L Y	: M. M. M. M. M. P. M.	,
Grazing	1.1.1		
Foral diggings	0	t the same will had the time time time time time time time tim	
Frasian		, the max any lab of the lab has been as the set of the set, and we of the do-set, and an the set of the set	
Storm	10	. Here, Mark and Sara Cala, per bard half fact, and and fact, fact, fact, fact, fact, gar, gar ways and ways and new set have b	
Human litter/waste		****	
Infrastructure	V. {building	g/road/tracks/fence}	
Artificial noise/light	11 {poise/li	ieht}	
Other			
[Severity: (0 nil) - 3 (severe); Ex	tent: Localised (L) / Wide	espread (W); Info. Source: Direct	t obs. (#) / Anecdotal (@) / Combination (#@)]
HABITAT CHARACTERIST	CS - ABUNDANCE		
Feature	Abundance <sup>^</sup> - Notes	<u></u> <u>W</u> ;	aterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	NS Ø		ry/Filling/Receding/Unknown or Neutral}   {\still/Flowing}
Small (<10cm) tree hollow	NS 2	, in para land land land land land land land lan	
Fallen logs (>10cm diam.)	<b>┦月</b>		-
Course litter (>2cm diam.)	<del> </del>	/VO	ites:
Fine litter (<2cm diam.)			NA
Decorticating bark		L He (P), try (P), M. He (M), M. HE (M)	
Cryptogan			
Stones (20-60cm)		Ca	aves: {Deep/Shallow/Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	13		41A
Large Boulders (>2m)	6	a law loop hed her. Het, Het, het Her het jas het jas Het jas Het Het het.	NH
Exfoliating rock		Ra	atio grass/forb (%): 6512 =
Active flowering (T & S)	-		0400
Other	ar de de de la 10 de	Gr	round cover (%): Bare Ground : Rock : Litter : Live んてつくずく わち
		CV	WD (50m transect):
[Abundance: Nil(0), 1(Rare), 2(	l Rare/Occasional), 3(Occa	asional), 4(Occasional/Common)	, 5(Common), 6(Common/Abundance), 7(Abundance)
Site sketch/notes:			

Project number/name:	135037	Proje	ct location: Rap	Asada - H	P Stga
Site name: RE_25		Date: 21-4-	Observ	ers: P. Gvas	R. Williams
Latitude: - 19. 8 33325	Longitude: 147. (3941-7	Datum: ୴ଽଜୟ୍ୟ	Photos: North: East: 6	ゆらけらのC South マン West	: 061
VEGETATION PE (as managed):	1.3.7 11.3.9	DE /ob	Mostly	11.3.9	1 11:37 Drevet / shi
General vegetation descri	iption:		serveu).		in the second second
Euc woodland	(mostly E. Pla	ityphylia) w	G. striata cor	$mon$ $ast_2$	OVe/
C/OISSY	ground layer				
Layer^ Cover*	Height Range	Dominant species	5*	[Layer	: E, T1, T2, T3, S1, S2, G]
T1 5	12-15m E	tic pla Eur	Adl		
70 6	(L-9 n-	The case of C	CA ALLA	6000	
1.7 9	4.9.00	IT SPP. J. G.	STREAL FOR	( Kig KX)	
SI SHD port	hes 1.2 - 2.2n	1 Ziz M	190* Cry gra		
All Cont St	2-1.6m	HET CON, N	leg make, ch	gay", Ch	int
ritale, sig	nam , ISEIII	cmg vaginit	VOCUM	n waa kaal maa kaa dhee adoo ano aroo tada kare jilaa tajoo kiko mina kaka jina maa maa ma	
LANDFORM	Situation*:	Pattern*:	Slope position*:	Slope	e angle:
SOIL (tonsoil)	Benth: (Deen/Shallor		<u>۲</u>	Colour	
Notes:	Deptil. (Deep/Silano)		e.	Londul.	0.00
36.06.7	ومستعمين وسائم		<b>^</b>	1 +	Drown
DISTURBANCE Seve	erity/Extent^  Notes	(info source, fire so	ar height, time since e	<u>vent)</u>	
Fire	Scorched	trunk/some crown	death/much crown d	eath}	
Logging / clearing	al	er bes eine Will Mite Mite Mite beit Dies Wite Mite Mite Wite Mite Will Mite Mite Mite Mite Mite	me We day has bee day any we had soo dig date was any distance of the sour and the	n Bie Mit in der der der die An der	tur ma, ma
Non-native plant cover	aw	n in die als het jep jes in aje in die die het hie het die 20 K 40 K 40 K 40 K			
Grazing	1.W				
Feral diggings	<u> </u>		na ma kat ma ma nat ma nat ma	"S Mill Mar Adm Mar Albei Mill Mar Anis Med Mile Mile Mile Mar Anis Anis Anis Anis Anis Anis Anis Anis	
Erosion	<u> </u>	ar live for him 199, that line him 199 for her her him top him has bee first the bids with	ing and may have been start and any start and have have been been been been been been been be	n jan 100 Kin 100 Kil 100 Kil 100 Kil Kin 100 Kin 100 Kin 100 Kil 100 Kin 100 Kin 100 Kin 100 Kin 100 Kin 100 K	
Storm			* * * * * * * * * * * *		
Human litter/waste	U				
Infrastructure	{building/	road/tracks/fence}		n m. um na m. m. na me me na an an m. un pe bes des ets es des he he	
Artificial noise/light	{noise/lig	$ht$ $V_{OO}$	( ight tradic)	a' ang man lina, man man man lina, lina	
Other			5		
[Severity: (0 nil) - 3 (severe); Ext	I I tent: Localised (L) / Wides	pread (W); Info. Source:	Direct obs. (#) / Anecdotal	(@) / Combination (#	@)]
HABITAT CHARACTERISTI	CS - ABUNDANCE				
Feature	Abundance^ - Notes		Waterbody: {Marin	e/Estuarine/Riverine	Palustrine/Lacustrine}
Large (>10cm) tree hollov	vs \		{Dry/Filling/Receding	/Unknown or Neutra	al}   {Still/Flowing}
Small (<10cm) tree hollov	NS ().		{Natural/Modified}	{Pugging/Heavy G	razing/Light Grazing}
Fallen logs (>10cm diam.)	2		{Clear/Turbid/Surface	e Film Oil/Surface Fil	m Organic}
Course litter (>2cm diam.	12		Notes: Stan	vParla	
Fine litter (<2cm diam.)	5			· · · · · ·	
Decorticating bark	0	11 The SM, Lei MM MM And Med Med Me, SM, SM 104 Des 204 Min Ann MM My Die The Sm			
Cryptogam	0		- 15		
Soil cracks	2				
Stones (20-60cm)		n an	Caves: {Deep/S	hallow/Overhang/C	revices/Boulder Piles}
Boulders (61cm-2m)		an kana pang mang kana kang kang kana kana kana kang kana kang kana pang kana pang kana kana kana kana mang mat	ar a. 6 <sup>11</sup>	NI	
Large Boulders (>2m)	<u> </u>		Dette server (for the 10	1-1	
Exfoliating rock	<u> </u>		Ratio grass/forb (%	91: SD	20
Other			Ground cover (%):	Bare Ground : Roc	k : Litter : Live
	T, Ma har an an Ley Ley Ye, Jer (n, L. ) An Mr. W. Ka Ma M. W. Ka Ma	nn Mar ann Ann Mar ann Aine Ain Ann Ain Aine ann ann ann ann ann ann ann ann ann a		0:0	:5:95
		-	CWD (50m transec	t):	
[Abundance: Nil(0), 1(Rare), 2(R	Rare/Occasional), 3(Occasi	onal), 4(Occasional/Con	nmon), 5(Common), 6(Com	mon/Abundance), 7(A	bundance)
Site sketch/notes:					

Project number/name:	135037	Project	location: UP	SZ	
Site name: $RE - 26$	ð -	Date: 21/4/21	Obse	rvers: RW,	PB .
Latitude:	Longitude:	Datum:	Photos: North	613	South: 612
-19. 833417	147,136705	i wsgraf	East:	614	West: 615
VEGETATION	2 115			4-y	
RE (as mapped): 114	3.400	KE (ODSEI		5	• • • • •
General vegetation desci	Iption:	the ribarian Val	n (oringing	drainage	line). Ephemoral
drainage line).	Marting Los	tes in		L.	
Layer^ Cover*	Height Range	Dominant species*			[Layer: E, T1, T2, T3, S1, S2, G]
TI D	15-20 M	Mel leu (or tes	1 100 540	hill. Die dels wei dels die wei des per per per per aus aus aus au a	
- <u>T2</u> _S	8-12 m	Alp exc, Pla Co	or, Gre Str,	aar na ma ma kating kating ang saring baring kating k	a, nor me pa we not not not not but but but an time an time an time ba time to the time but but but but but but but but an equip of the time but but
SI V	1-2 M	Ziz May", Ori	1 grat		
<u> </u>	<u>o-1m</u>	<u>Meg Max", Xa</u> Spo Nat*	<u>A PVM, Alt 6</u>	icy Bot per;	, 
		·····			
LANDFORM	Situation*:	Pattern*:	Slope position*:		Slope angle:
SOIL (topsoil)	Depth: {Deep/Sh	allow/Skeletal} Texture:		Colour:	A
Notes:	Contraction and a strength	Soe	nd	Sar	idy (theor)
DISTURBANCE Sev	erity/Extent^  No	otes (info source, fire scar	height, time since	e event)	•
Fire	scorc'	hed trunk/some crown de	ath/much crown	death}	
l ogging / clearing					
Non-native plant cover	0	a har bas ma an has has an an all. Mit fan Hit his dit fan his has has has has has has has has hie hit his his t	a độn đản đượ kực độn độn tinh tiếc các đặn tiện tiện đặn tiên đạn đạn tinh tiến tiến t	per flor han hin, bin, bin, bin had sin, mit hiel bin som over im. Soo, b	
Grazing					
Grazing		n dar die hat hie die Die Mat das 100 Mat die 100 Ma	1 jun 100, 607 107 608 605 (007 60, 005 607 106 106 108, 007 604 105 107 607		
	A A A A A A A A A A A A A A A A A A A				
Erosion		b. We like the law we have the new state and the state that the state that the state that the state that the state	, one say has been had have been han have been been been been been had been here been here been here been here	tan, bard han dan dari daté tine bind bine jine daté ditis bine jine daté bine u	ar mar han mar han
Storm				22 upp gas gas ann gas inn filo ann fan inn lill inn inn ill an an a	
Human litter/waste	0				
Infrastructure	l 🖌  {buildi	ing/road/tracks/fence} V	oridge, Cul	vert	
Artificial noise/light	11 {noise	/light} road		14- 184, 185, 184, 184, 185, 185, 184, 184, 184, 185, 186, 186, 186, 187,	m, may may may may may may be and may may may any may pay by the Pay out Pay, and Pay May May May May May May May May May M
Other					
(Severity: (0 nil) - 3 (severe); Ex	 itent: Localised (L) / W	/idespread (W): Info. Source: Dir	rect obs. (#) / Anecdo	tal (@) / Combinat	ion (#@)]
HABITAT CHARACTERISTI	ICS - ABUNDANCE	1005pr.co.u (11);			in wen
Feature	Abundance^ - Not	ies	Waterbody: {Mar	rine/Estuarine/Riv	verine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	ws 🤈		{Dry/Filling/Receding	ng/Unknown or M	<pre>leutral}   {Still/Flowing}</pre>
Small (<10cm) tree hollo	ws 🏹	g (h), (h), (h) (h), (h), (h), (h), (h),	{Natural/Modified}	{Pugging/He	avy Grazing/Light Grazing}
Fallen logs (>10cm diam.	N R	al fan hat die het die het die het die het die het die het die die die het fan het het het die het die het die	{Clear/Turbid/Surfa	ace Film Oil/Surfa	ce Film Organic}
Course litter (>2cm diam	.) «	a an	Notes:		-
Fine litter (<2cm diam.)	18		,		
Decorticating bark	- <u></u>	is day and any new part from still that has non give ban, shill blin that has the film bat has bed blir ball bar			
Cryntogam	A	n ma inn inn line fan line fan jine fan inn inn inn inn fan inn fan inn inn inn inn inn inn inn inn inn an inn			
Soil cracks	10		1		
Stones (20-60cm)			Caves: {Deer	/Shallow/Overha	ang/Crevices/Boulder Piles}
Boulders (61cm-2m)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10 = 1000 + De 24	the se	y drivine try e	
Large Roulders (>2m)	Contraction Contact	J	None		
Evidiating rack			Ratio grass/forb	(%).	110 -
Active flowering (T & S)			Nauv Frass, ivia	40	168
Other			Ground cover (%	): Bare Ground	: Rock : Litter : Live
We fill the fill the fill first to fill the fill fills fill the set of the set of the set of the	. 1 (1), (1), (2), (2), (2), (3), (3), (3), (3), (3), (3), (3), (3			20 :	51:15:60
	1 1		CWD (50m transe	ect): NA .	
[Abundance: Nil(0), 1(Rare), 2(	Rare/Occasional), 3(O	ccasional), 4(Occasional/Commo	on), 5(Common), 6(Co	mmon/Abundance	2), 7(Abundance)
Site sketch/notes:					

Project number/name:	13503-1			Project	ocatio	n: HPS	2		
Site name: R.F. 38			Date: 21-4 -	-21		Obs	ervers: P. Bupsi	R.Williams	
Latitude:	Longitude	:	Datum:		Photos	: Nort	h: 616	South: 017	
- 1.868216	147.1	51464	WS49	4		East	: 618	West: 619	
<u>VEGETATION</u> RE (as mapped): RE	11.3.7			RE (obser	ved):	11.3.	35		
General vegetation descri	ption:						1 Shur	h la	
Poplar Gum wo	odland	W very	Sparse	TOWER -	( LR	ingers	4 24141	is loger	
dominated by	Chinee	Apple.	Degrad	hed gro	und	layer	Grasses	spark)	
Layer^ Cover*	Height Rar	nge	Dominant	t species*				[Layer: E, T1, T2, T3, S1, S2, G]	
Τι Sp	12-16r	N	Eu(	pla		nan dia ang kan kan kan dat ang pan pang Tan lam ang kan kan kan ang kan ang a	we let the second seco		
T2 V	4.8N	\	Éuc	pla	in in ili ili ili ili ili ili	lak III III Ala GI III Ala ak ke a			
SIM	1.5-20	4	Ziz	Mau*	Ciu	GIO X			
<u>Ġ</u> D	<1.4	M	Sty	sca*	Het	du	Bot p	er Pankum sp.	
			9	Chl inf	*		*		
**	er an an see an en th ber at he su an	are po, we do fee me an m. n. no m an a		ner an me par ma se, pa an me me me			te det juur 19. gin ges jag jag sit jag se se jag ses s	* * # \$ ## # # # # # # # # # # # # # # #	
LANDFORM	Situation*	•	Pattern*:	P	Slope p	osition*:	F	Slope angle:	
SOIL (topsoil)	Depth: {De	ep/Shallow/	/Skeletal}	Texture:			Colour:		_
Notes:			-	Cla	1			12 22 12	
DISTURBANCE Seve	erity/Exten	t^  Notes (i	nfo source	e, fire scar	) height,	time sinc	e event)		
Fire	0	{scorched to	runk/som	e crown de	ath/mu	ch crow	n death}		
Logging / clearing	Ĩ	ζ, με — αι μι τη τη το προγού το τη το το							
Non-native plant cover	2W								
Grazing	W.	, ground	layer	indice	les	enes.	due his	toring algering	
Feral diggings	0								
Erosion	0	for the last to the time to the last too.	has the bill the full bill be lied the bis	the last law was line due to a line line line to a	et hat me we had in our be.	the last last last last last last last			the start law law law line line
Storm	0			dai dib dhe lan me ant dai 400 dau dat lad d		ale dhe tau idé lik dha liké liki. No d	ur bill dash bille bill basi sala bila bila dila dash dash dila d		
Human litter/waste	0	<i>(</i>		-					
Infrastructure		{building/ro	pad/tracks	/fence}		kan Mila dan kan kat dan kan dan dan d			
Artificial noise/light	5 100 Sec. 11 Sec. 10 Sec. 10 Sec. 10 Sec. 10	{noise/light	Y 10	20	in was ben die Die Ven im Die I	pe bie ipt bie juy ten bie gee bie j	er lett låte live ber före lette båt, sött lätte hars sött gör ö	19 19 19 19 19 19 19 19 19 19 19 19 19 1	
Other									
[Severity: (0 nil) - 3 (severe); Ext	l l ent: Localised	l (L) / Widespr	ead (W); Info	o. Source: Dir	ect obs. (	#) / Anecde	otal (@) / Coml	bination (#@)]	
HABITAT CHARACTERISTIC	CS - ABUND	ANCE							
Feature	Abundance	^ - Notes			Waterb	ody: {Ma	rine/Estuarin	e/Riverine/Palustrine/Lacustrine}	
Large (>10cm) tree hollow	rs 2		lië lie, mê ûn, am tikt ha den den keje dye	ne me fer un be mit de fer an oe je	{Dry/Filli	ing/Reced	ing/Unknown	or Neutral}   {Still/Flowing}	
Small (<10cm) tree hollow	<u>15</u>	ing the light law law list has just just law type such	lan Kesi Kesi Kesi Kesi Kesi Kesi Kesi Kasi Kasi	has 100 line too her late ins said the dot het	{Natural	/Modified	}   {Pugging	g/Heavy Grazing/Light Grazing}	
Fallen logs (>10cm diam.)	3				{Clear/Ti	urbid/Surl	ace Film Oil/S	Surface Film Organic}	
Course litter (>2cm diam.)	44				Notes:				
Prine litter (<2cm diam.)		Nie hat ins ins ink Nie All ins ins. Nie has Nie I	he im bli die ins im milie die he me						
Cryntogam	/1.	lin, line lant met sine line line. Dies mit hen sine hen b	14 mm m- 15 14 14 14 mm m 19 mm						
Soil cracks	0								
Stones (20-60cm)	0	nar 100 No Ma An	n. h. di da 16 56 1. 18 vi m n.	,	Caves:	{Dee	p/Shallow/Ov	erhang/Crevices/Boulder Piles}	
Boulders (61cm-2m)	0	init init init init ana pao ana pao ina pad init y	jan ling pyr ang gy, iper pan (nil All hai da.	200 ku m. m m. n. er er m h. n. er fr			y ) 1	2	
Large Boulders (>2m)	0	nee mee mit die het hie hie het hie nie het hie het het h					Nil		
Exfoliating rock	0				Ratio gi	rass/forb	(%): 2	0170	
Active flowering (T & S)	And the second s	hal. Alle han dan ann alle han dein hall ant add bic d	ing ma mu dha kili kila mi, ikor mu kila mu	na na ta ka ka dhan dha na ba ba a		127		~/ /0	
Other	San and has been been been been been been been bee	Nan lan, ang lang ang lan, ang ang ang lan, ang lan 1	nn, iac an ant in. Inc. an an inc. inc.		Ground	cover (%	6): Bare Grou	und : Rock : Litter : Live	
					<del>CWD (</del> 5	<u>Om trans</u>	ect):		
[Abundance: Nil(0), 1(Rare), 2(R	are/Occasion	al), 3(Occasion	nal), 4(Occasi	ional/Commo	n), 5(Con	nmon), 6(C	ommon/Abund	dance), 7(Abundance)	
Site sketch/notes:									

Project number/name:	135037	Project l	location: HPS	52	
Site name: Re_ 39	l se	Date: 21/4/21	Obse	rvers: fw	95
Latitude: -14, \$67627	Longitude:	Datum:	Photos: North East:	626	South: 62 ( West: 62 3
VEGETATION				The second second	
RE (as mapped): 11.3	9	RE (obser	ved): 11 3	35	
General vegetation descr	iption:	01 4 304	I field C	and of	wards in shalk R
Ease pla open	wooding on	flat amuun	Hym	the set	where a start of the start of t
ground layer-	little native la	crvitikent.			
Layer^ Cover*	Height Range	Dominant species*	f		[Layer: E, T1, T2, T3, S1, S2, G]
71	12-16 11	Euc pla, 101	103		
	8-10 M	EUC AR, Co	121	her and her her her her me hat min his her her her me and he	
SI M	1-2.5 m	212 May 1 49 9	(A.*		
<u>6</u> 0	0-1 M	sty sca; Culga	y", Het con,	Att fie T	he qua, sty hom
LANDFORM	Situation*: B	Pattern*:	Slope position*:	the second se	Slope angle:
SOIL (topsoil)	Depth: {Deep/Shallow	/Skeletal} Texture:		Colour:	
Notes:		(	July	Bri	san and
DISTURBANCE Seve	erity/Extent^  Notes (	info source, fire scar	height, time since	e event)	
Fire	S {scorched	trunk/some crown de	ath/much crown	death}	
Logging / clearing	IL Powerl?	ne corridor/	roges		• • • • • • • • • • • • • • • • • • •
Non-native plant cover	3W				
Grazing	2 W correct	prossure low -	- olones indi	icate an	access of grazing historical
Feral diggings	0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	4 7 7
Erosion	8	ar 196 198 199 194 196 196 196 196 196 197 197 197 198 wat bits bad dha bia ika ika 196 496 496 196 196 1	of the lot. We have the file and the sub-last has have sum now had have any	ar ine bin ine sile has lin one hes bit hel sei ne hes no no	
Storm	Contraction and the second	to had had had blac that the mer see had hind this had too hild had had hild had blac hild hild had blac hild h	ng Mar Mala line line tige tige topi and bige han line line line line line line bid jung bige line	nn han den fost den dan mar fond lant fost dan ann, den hun fost fost	) manten der hell har fen des ten per ber fen bes hel bei her des bei her der hel bei an an ander her her her bei
Human litter/waste	0	te das me lite les um uit aite me des des les les que um lite die Jon des ms des jun me te			
Infrastructure	1 / {building/r	oad/tracks/fence}		ar This line line into the pine para lan line has para line line had not	
Artificial noise/light		Vauriacity ferrees	***		
Artificial fiolocy light		U 109.0	al das has has has his his has has his in the second second second second	an bin Mil Tin and inc. Inc. Inc. an his an inc. Inc. Inc.	
Other					
[Severity: (0 nil) - 3 (severe); Ext HABITAT CHARACTERISTI	tent: Localised (L) / Widesp	read (W); Info. Source: Dire	ect obs. (#) / Anecdot	tal (@) / Combina	tion (#@)]
Feature	Abundance^ - Notes	2	Waterbody: {Mar	ine/Estuarine/Ri	iverine/Palustrine/Lacustrine}
Large (>10cm) tree hollov	NG 2		{Drv/Filling/Recedir	ng/Unknown or	Neutral   {Still/Flowing}
Small (<10cm) tree hollov	NS \$ //1_		{Natural/Modified}	I {Pugging/He	eavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	2	na late an 117 kel na lag ha lat na an an ha lat he he he ha ha ha ha ja ha ja ha ja ha ha h	{Clear/Turbid/Surfa	ace Film Oil/Surf	are Film Organic}
Course litter (>2cm diam.	1	P 26 20 70, 75 26 26 26 20 20 20 20 20 20 20 20 20 20 20 20 20	Notee		,
Fine litter (<2cm diam.)			10163.	N	200
Decorticating hark					*
Contorom		A, MA (M. 11)			
Soil crocks	N. N.				
Stance (70-60cm)		ar per se ne per per per per per per per se ne per per bar har har per per per per bar har har har h	Course /Deen	/shallow/Ovorh	and (Crowieses (Doulder Diles)
Deuldore (61cm.2m)		añ dek 166 Mar Ma, ann had dhe nat Mai Mar har dhe nay ma haa una dad har har ina par an	Laves: Incep	/Snallow/Overna	ang/Crevices/Bounder Files/
Doulders (Stuir-Zin)		er bei jun her ber ber ber ber bei	Non		
Large Dourders (2211)			Datia grace /forh	/0/\.	
Extollating ruck	<u> </u>		Katio grass/ ioin	( <u>%):</u> 20/9	10
Active flowering (1 & 5)	a na an		C	F.	a shartan a the
Other		da lika ar life ila ila ila da lika ila ila ila ila ila ila ila ila ila il	Ground cover (%)	): Bare Grouna	Cock : Litter : Live
		-	CWD (50m transe	ect):	
[Ahundance: Nil(0). 1(Rare), 2(R	 Pare/Occasional), 3(Occasio	nal), 4(Occasional/Commo	22) 5(Common), 6(Co	mmon/Abundanc	a) 7(Ahundance)
Cito skotch /notos		nai,, tooousionai, com			
Sile Skelling Holes.					

Project number/name:	13503	Project location: LPS2
Site name: QC_40	5	Date: 21/11/21 Observers: 200,16
Latitude:	Longitude:	Datum: Photos: North: 650 South: 63
-19.001007	181-122	6 55 USE4 East: 6 5건 West: 6 5 1
VEGETATION	34 111 2	20-1427
RE (as mapped): (() as	SU/H-G	Cos/(1 2 / RE (observed): u
Cor to Mikeo	ption: 1 Open	woodlond on alluwial plain. Wecals present in Shub
Layer^ Cover*	Height Ran	Ige Dominant species* [Layer: E, T1, T2, T3, S1, S2, G]
TIS	15-10	(or tas, corcla tocdal, ocpa
T2S	6-10-	TI Spacing, lite Str
<u>SI 3</u>	1-25 M	Ziz mas Oy gran (S with me memory)
G D	<b>Ø-</b> AA	Sty hum sig som that can see sp. chil inf "
	, day gat the day lake are too tay did the day now Y	
LANDFORM	Situation*:	Pattern*: Slope position*: Slope angle:
SOIL (topsoil)	Depth: {De	ep/Shallow/Skeletal} Texture: Colour:
Notes:	And the second s	Ciny/loan Brian
DISTURBANCE Seve	erity/Extent	tAl Notes (info source, fire scar height, time since event)
Fire		<pre>/scorched trunk/some crown death/much crown death}</pre>
Logging / clearing	1.3	
Non-native plant cover	Bul	
Non-nauve plant core.		
Grazing	<u>I</u> R.	
Erosion		
Storm		
Human litter/waste	0	
Infrastructure	144	building/road/tracks/fence}
Artificial noise/light	14	noise/light} 10ad
Other		
(Severity: (0 nil) - 3 (severe); Ext	l I tent: Localised	(L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]
HABITAT CHARACTERISTI	CS - ABUND	ANCE
Feature	Abundance	A - Notes Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollov	NS 1	{Dry/Filling/Receding/Unknown or Neutral}   {Still/Flowing}
Small (<10cm) tree hollow	NS 3/14	{Natural/Modified}   {Pugging/Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	3	{Clear/Turbid/Surface Film Oil/Surface Film Organic}
Course litter (>2cm diam.	.) 4	Notes:
Fine litter (<2cm diam.)	14	NA
Decorticating bark		
Cryptogam	0	,
Soil cracks	10	
Stones (20-60cm)	Tw	Caves: {Deep/Shallow/Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0	4.8A
Large Boulders (>2m)	0	
Exfoliating rock	O I	Ratio grass/forb (%):
Active flowering (T & S)		30/70
Other		Ground cover (%): Bare Ground : Rock : Litter : Live
han han me. 👫 nac ga, ga, ma. 🗮 🐄 na me, an tha me na an		4 : 3 : 1 : 93
		CWD (50m transect):
[Abundance: Nil(0), 1(Rare), 2(R	Aare/Occasion	al), 3(Occasional), 4(Occasional/Common), 5(Common), 6(Common/Abundance), 7(Abundance)
Site sketch/notes:		

Project number/name:	13503	7		Project	location:	HPSZ				
Site name:			Date:	Jai		Observe	ers:			
RE-42			26/5	721	N	N1 11	In	C		
Latitude: -14. 683 3671	Longitude	188844	Datum:	84	Photos:	East:		West:	124	
VEGETATION	7/11.3	3.9		PE (obse	ned). [[	.3 7				
RE (as mapped): General vegetation descri	ption:		•	RE (ODSC	iveuj.				King hand	
	,	or sa		00 U		30000	6w * Q		Lys noo	4
Layer^ Cover*	Height Ra	nge	Dominant	t species*	طما	( and a la		[Layer: E,	T1, T2, T3, S1, S2, G]	
<u> </u>	15-1	3	(01 19)	, (9/	oalt	Cor Cr	i ti	c pia		
<u></u>	6-16	2	TI SP	ling and		<u>, Ojo</u>	noo		nna ma inn har var ma ma var jeg, legt ted per any nna har ter her her her her her her her	
<u> </u>	1.9	<u>~</u>	Z.17_M	Q.A.L	YON H	00 ·	Infe	ALL CI	ALL SIL	
a D	0	2	Sty n	AAc.T.j.	Ule MA		1-1-6	<u></u>	<u> </u>	Magazan
***			<u>14676</u>	<u>275 - j</u>						
			and have been been specified and start and been start and	ann ann ann an ann an an an an an an an		u يور جور مي احد هذا احد هذا احد احد احد احد احد احد احد ا			nn feil feil feil feil feil feil feil an	
					na dia 400 ket 904 pe am pa am am					
LANDFORM	Situation*	R	Pattern*:	LP	Slope po	sition*:		Slope a	ngle:	
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal}	Texture:			Colour:			
Notes:				(lan)	Loam		Bron	NA		
				1						
DISTURBANCE Seve	erity/Exter	t^  Notes	(info source	e, fire scar	height, ti	me since ev	vent)			
Fire	0	{scorched	trunk/som	e crown d	eath/muc	h crown de	eath}			
Logging / clearing	IW			tax and had tam MR Mn Mn Mir Mir Mir Mir				na ne os mi na in		
Non-native plant cover	SW									
Grazing	ZW					197				
Feral diggings	0									
Erosion	0	a na, ant ma ma na are na dia dia dia dia						120.0		
Storm	ñ	a sup nas min nas cas an na ma nas are no	ما ما بند ما مد مد مر مر بم بي ور	ine her to not hel to hel hel her die Hit	ne an ma ma ina ina par po ina ini					
Human litter/waste	õ					n yn die (sit it, it, it, it, it, it, it, it, it, i				
Infrastructure	6.4	{building/	road/tracks	/fence}						
Artificial noise/light	6	{noise/light	nt}			n manancan an diche ac ai in in an he h		9. 16 16 16 16 19. ps de 16 16 16		
Other						n na na ha na ini ini ini ini ini ini ini ini ini	py and the last and the last last last last		gan san gan pap sapi man anar anni ann ann san ban ban ban ban ban. Na Mill Mill Mill Mill Mill	a got per son, mar mer min min han inn inne i
[Severity: (0 nil) - 3 (severe); Ext	' tent: Localise	' d (L) / Widesp	oread (W); Infe	o. Source: D	irect obs. (#)	/ Anecdotal (	(@) / Comb	ination (#@)	]	
HABITAT CHARACTERISTI	CS - ABUNI	DANCE								
Feature	Abundance	e^ - Notes			Waterbo	dy: {Marine	/Estuarine	/Riverine/P	alustrine/Lacustrine}	
Large (>10cm) tree hollow	vs 3				{Dry/Fillin	g/Receding/	Unknown	or Neutral}	{Still/Flowing}	
Small (<10cm) tree hollow	vs 4				[{Natural/I	Modified}	{Pugging	/Heavy Gra	zing/Light Grazing}	
Fallen logs (>10cm diam.)	4				{Clear/Tu	rbid/Surface	Film Oil/S	urface Film	Organic}	
Course litter (>2cm diam.	5			**	Notes:					
Fine litter (<2cm diam.)	5				_ 1	MA				
Decorticating bark	2			f han lang Yan' juur bint han bin. Web, Yan' Hile						
Cryptogam	0				_					
Soil cracks	0									
Stones (20-60cm)	0				Caves:	{Deep/Sł	nallow/Ov	erhang/Crev	vices/Boulder Piles}	
Boulders (61cm-2m)	Ŏ		the say and last two per that the last the say the		-	NLA				
Large Boulders (>2m)	ō.					fast				
Exfoliating rock	Ó				Ratio gra	ass/forb (%	):	100		
Active flowering (T & S)						2.42	40	150		
Other			wa' and has had had has has him him him the	n ma mir mir ing inge bee bee bes hell ling bee	Ground	<u>cover (%):</u> E	Bare Grou	ind : Rock :	Litter : Live	
						7	2 (	2 5 -	ער	
					<u>CWD (50</u>	Im transect	1			
[Abundance: Nil(0), 1(Rare), 2(F	Rare/Occasio	nal), 3(Occasi	onal), 4(Occas	ional/Comn	non), 5(Com	mon), 6(Comr	non/Abund	ance), 7(Abu	ndance)	
Site sketch/notes:										

Project number/name:	35037	Project	location: HPS 2	, e
Site name:		Date: 26/5/21	Observe	's: had
Latitude:	Longitude:	Datum:	Photos: North: 14	South: 131
VEGETATION	INT TOP - THE	n nancont	Last. 19	west t 3.3
RE (as mapped):	3 7	RE (obser	rved): 13.7	
General vegetation descri	ption:	es dominated	oper wood	land with Euc Pla.
Layer^ Cover*	Height Range	Dominant species*		[Layer: E, T1, T2, T3, S1, S2, G]
<u>-11 S</u>	14-18	Cos tes tua	<u>Pla</u>	
sa s	4-10	TI 500		
51 S-M	1-5-3	212 Mare + 5	ar acv, cr	<u>4 4</u>
G D	0-1.5	Jec nex		
LANDFORM	Situation*:	Pattern*:	Slope position*:	Slope angle:
SOIL (topsoil) Notes:	Depth: {Deep/Shal	low/Skeletal} Texture:		Colour: Brown
DISTURBANCE Sev	erity/Extent^  Not	es (info source, fire scar	height, time since ev	ent)
Fire	Ø {scorch	ed trunk/some crown de	eath/much crown dea	ath}
Logging / clearing	2.00			
Non-native plant cover	INAL			
Grazing	210 Can	r mats.		
Feral diggings			*****	
Frasion	6			
Ctorm	10	i har hild dan, jul. M. M. Alle Alle Mar and an and has not has has has has and MM Hild hild dat MP his free an		
Human litter/waste				
Infractructura		og/road/tracks/fence}		<u>*************************************</u>
A stificial poico/light	Contraction (noise/	lisht		
			m. Die Alle anv ble bas vor lept bie. Die bie Mit ble bie bie bie bie bie bie ges jes jes an Mi	
Other	~			
[Severity: (0 nil) - 3 (severe); Ex	tent: Localised (L) / Wid	despread (W); Info. Source: Di	irect obs. (#) / Anecdotal (	@) / Combination (#@)]
HABITAT CHARACTERISTI	CS - ABUNDANCE		ere a colorador (64 actors)	(=
Feature	Abundance^ - Note	5	- Waterbody: {Warine/	Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollow	NS 32	1, 11 m M M M M M M M M M M M M M M M M M	{Dry/Filling/Recealing/	
Small (<10cm) tree hollow	NS 3		{Natural/Iviounieur	
Fallen logs (>10cm diam.)	<u> /</u> {		{Clear/Turbid/Surface	
Course litter (>2cm diam	:}!	"你""""""""""""""""""""""""""""""""""""	_Notes:	
Fine litter (<2cm diam.)			-	
Decorticating bark		at, yaa maa maa maa ina ina ina ina ina ina ina ina ina i	- NA	
Cryptogam	6		-	
Soil cracks	<u> </u>	****		
Stones (20-60cm)	0	all and the set and per law 100 100 100 100 100 100 100 100 100 10	Caves: {Deep/Sn	allow/Overhang/Crevices/Bouider Piles}
Boulders (61cm-2m)		an had had had had had not per had had had had had had had had had not had had not and had had had h	- NA	
Large Boulders (>2m)	<u> </u>			
Exfoliating rock			Ratio grass/torb (%)	90/10
Active flowering (T & S)	all for the second second			
Other		an a	Ground cover (%): B	are Ground : Rock : Litter : Live
			CWD (50m transect	l
		tour the Allower Sense / Comm		(Abundanca)
[Abundance: Nil(0), 1(Rare), 2(	Rare/Occasional), 3(Uc	casional), 4(Occasional/Comm	10h), S(Common), o(Comm	ion/Abundance), /(Abundance)
Site sketch/notes:				

Project number/name:	13503	37	Pre	oject location:	HPS;	2.		
Site name: RE_44			Date: 26/	15/21	Observe	rs: Rw		
Latitude:	Longitude	2:	Datum:	Photos:	North: 17	15	South: 126	>
VEGETATION 11 2 3	<1113 3	30/11.3	7		East: 1	<i>L</i> 1	west: (P	<u>&gt;</u>
RE (as mapped):	3/11		RE	(observed): (	1.3 /			
General vegetation descri	ption: (	or sp	Mixed	ofen we	bodlen	المادر ا	n lys	hoo .
Layer^ Cover*	Height Ra	inge	Dominant spe	cies*	e e la	lare	[Layer: E, T1, T	[2, T3, S1, S2, G]
TI S	15-19	1	Cor tesi	Cor oal, C	or Cla	ever	<u>14</u>	
SI C-AA	1 6-12	 }	ILSPEL	F Pas Cast	cys n	<b>4.9</b>		
31 3.14	0-1	<	Stilling.	Un Most	(LAL IN	Г <sup>4</sup> Л.Н-	Cic <sup>®</sup> , Ma	s sile hot can
- (7						¢		·····
			, , , , , , , , , , , , , , , , , , ,	n nat man dan dite dati taki dat dati dati dati dati dati dati dati				
LANDFORM	Situation	*: ?	Pattern*:	Slope pos	ition*: √		Slope angle	:
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal} Tex	ture:		Colour:		
Notes:			C	lay/loam		Brown	C	
DISTURBANCE Seve	erity/Exter	nt^  Notes (	info source, fir	e scar height, tir	ne since ev	<u>ent)</u>		
Fire	6	{scorched	trunk/some cro	wn death/much	crown de	ath}		
Logging / clearing	IW				- <b></b>			
Non-native plant cover	3W	in the set parties for the first and the part is						
Grazing	2W	2						
Feral diggings	<i>Q</i>				s ann ban ann Dan ban bar ban dan ann Dàn dhi		,	
Erosion	0	t in. Ind pill for 'n. Ins the dis the bir till it	17 Mar Phu And Mar Jun Way dan dan ana any dan any dan pan ju		e nav une ave inst had has not been som beer had	s bege lann hant. Inter diese Mild auss 1888 Mild aller wi	n has top ling and top link link two link had link had set	
Storm	0							
Human litter/waste	0				n gir, pug pin hain pan pini pini pini gina ana pinc gin.			***
Infrastructure	16	{building/r	oad/tracks/fen	ice}				
Artificial noise/light	0	{noise/ligh	t}				n and dee last pay last has been been been been been been been bee	
Other								
[Severity: (0 nil) - 3 (severe); Ext	l tent: Localise	ı ed (L) / Widesp	read (W); Info. Sou	rce: Direct obs. (#) ,	/ Anecdotal (	@) / Combin	ation (#@)]	
HABITAT CHARACTERISTI	CS - ABUN	DANCE						
Feature	Abundanc	e^ - Notes		Waterboo	ly: {Marine	/Estuarine/	Riverine/Palus	trine/Lacustrine}
Large (>10cm) tree hollov	vs <u>3</u>	a and mini day tay day day day day tak tak mini dar		{Dry/Filling	/Receding/I	Unknown o	r Neutral}	Still/Flowing}
Small (<10cm) tree hollow	vs 4 1	The second second second second second second	na, Mar Har Mai Ina Min Mai Min Kat Mai Min Min Min Min Min Min Min Min Min	{Natural/N	iodified}	Pugging/۱ (Pugging/۱	feavy Grazing/	Light Grazing}
Fallen logs (>10cm diam.)				{Clear/Turi	bid/Surface		Tace Film Orga	mey
Course litter (>2cm diam.			nn pur pas Dis dat jais pår Dat Her Das plis Dat Dis her Dit die D	Notes:	A.			
Pine litter (<2cm diam.)			ine sine dat mit sine sine sine soor van die beke van die beer link i					
Cryntogam	~			n, inn' hav has inn, inn inn'				
Soil cracks				an an dan dar dar bar Bit				
Stones (20-60cm)	0	i na ma un los ma inclusion de las estas ten ten		Caves:	{Deep/Sh	allow/Over	hang/Crevices	/Boulder Piles}
Boulders (61cm-2m)	0				N 14			
Large Boulders (>2m)	0							
Exfoliating rock	0			Ratio gras	ss/forb (%)	i s	0150	
Active flowering (T & S)			an me an an an he he at at 10 ke he he hit he he he		ia chi a	*		
Other			ny, yao ma na ma'any kao amini kao	Ground c	over (%): B	are Groun	a : ROCK : Litt	er : Live
				CIMP (ED.	n trancast	5	0.5	10
						L		
[Abundance: Nil(0), 1(Rare), 2(F	are/Occasio	nal), 3(Occasic	onal), 4(Occasional)	common), 5(Comm	ion), 6(Comm	non/Abunda	nce), /(Abundar	ce)
Site sketch/notes:								

Project number/name:	1350	57	Projec	t location:	HPS2		
Site name:			Date:		Observe	ers:	
Latitude:	Longitude	a.		Photos:	North	-	South
-19.910447	147-	208226	WSG84	FIIOLOS.	East:	-	West:
VEGETATION RE (as mapped): (1.3	.7/11	3.9.	RE (obs	erved):	(1.3.3	15	
General vegetation descri	iption: 🧹	Lic Olo	davia and		Hand i		
		oc pro	e e e e e e e e e e e e e e e e e e e	W000	AL SAME		
Laver^ Cover*	Height Ra	inge	Dominant species	*			[Laver: E. T1. T2. T3. S1. S2. G]
TI S	14-1	<u> </u>	EUC Pla /	cor cla	Car	ted	
T2 S	6-13	2	TI SPP 1	pla co			
-51 5	1.5-	3	217 Man J	Gre 9	<u>si", l</u>	as for	, Arg Ner
(O political)	<u>)</u>		ALL OF	Day C.	<b>N</b> KA	. S	
EQ	0-1		ALC HIC +	TUN 40	<u> </u>		
The sum that that that that now had not that had had non sum had not the black that the had had had had had had	ine and and talk tale has had been been said the	tend had then that had still blin, him had the little star t		and had the lost had had not the lost out the lost had he	ann ann and lean ann lear ann had lear lean le		
		-t-					
LANDFORM	Situation	ξ	Pattern*:	Slope pos			Slope angle:
SOIL (topsoil)	Depth: {D	eep/Shallow	/Skeletal} Texture	:		Colour:	
Notes:			clay	1100man		Derk	brown
DISTURDANCE	15 A.		· · · · · · · · · · · · · · · · · · ·	- h - t - h at -			
DISTURBANCE Seve	erity/Exter	It^ Notes	into source, fire sca	r neight, tir	ne since ev	vent)	
logging / clearing		(scorched)	trunkysome crown o	leath/much	crown de	aury	
Non-native plant cover	2.			an, har bar an, an an' le, he he he he he he he	une lan. Sam haf han dan ann han ilin ilin ili	el line fiel die leie Ver. silt fiel Vel vel die leie der	
Grazing	2.63						
Feral diggings	0		na dha pan bha pan ait bab hai pan pina pina pina pina pina pina pin				
Erosion	Ō					660 d.	
Storm	6						
Human litter/waste	0	(1. 11.12		in 10 km ill in to to to to to to to to to		· ao	
Artificial poice/light		{building/r	•1	Mi lan (kai lan (ye ye ye jan jan ya mu ya (ya ya			
Artificial noise/light		[{noise/lign	L } na data data dia tanàna dia kaominina dia mampikambana dia kaominina dia mampikambana dia kaominina dia kaominina I	n, an an ha ha na an ha ha ha ha na ha ha	ann dan lan lan lan bin bin lan jan bin dalam	. 10. 10. 10. 10. 10. 10. 10. 10. 10. 10	
2							
[Severity: (0 nil) - 3 (severe); Ext	ent: Localise	d (L) / Widesp	read (W); Info. Source: [	Direct obs. (#) ,	Anecdotal (	@) / Combina	tion (#@)]
HABITAT CHARACTERISTI	CS - ABUN	DANCE					
Féature	Abundance	e^ - Notes			V: (Marine) /Receding/	/Estuarine/Ri Linknown or l	verine/Palustrine/Lacustrine}
Small (<10cm) tree hollow	VS /L			{Natural/M	odified}	Pugging/He	eavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	3	a hai hat liki kin ha. Ni, tar kin hat kat ka		Clear/Turk	id/Surface	Film Oil/Surfa	ace Film Organic}
Course litter (>2cm diam.	) 4			Notes:			
Fine litter (<2cm diam.)	5		و همه منه الله فارو منه الله الله عنه عنه عنه عنه الله منه الله منه الله عنه الله عنه ال				
Decorticating bark	3						
Cryptogam Soil cracks							
Stones (20-60cm)	0			Caves:	{Deep/Sh	allow/Overh	ang/Crevices/Boulder Piles}
Boulders (61cm-2m)	ñ						
Large Boulders (>2m)	ð						
Exfoliating rock	Q			Ratio gras	s/forb (%)	: 2de.	ò
Active flowering (T & S)				Ground	Wor /0/1. 0	are Ground	· Pack · Littar · Liva
Juner	- Har has been and his has has her her. Me	( ) in the last dis in the last in the last is the las	the half that was they had has been half. Mit this tak was this this was this this this this the		wer (%): B	are Ground 81 - 1	TOUR LILLET LIVE
	C. WINGERS			CWD (50n	n transect	):	
(Abundance: Nil(0), 1(Rare), 2(R	I are/Occasio	l nal), 3(Occasio	nal), 4(Occasional/Com	non), 5(Comm	on), 6(Comm	non/Abundanc	e), 7(Abundance)
Site sketch/notes:							······································

roject number/name:	1350	37	Pro	ject locatio	n: HPSZ	2		
ite name:			Date: 26 / 5-	121	Observe	ers:		
atitude:	Longitude	9:	Datum:	Photos	North: (!	o So	outh: In	
_19.410261	147.20	<b>26403</b>	w3684		East: 112	<u> </u>	/est: 113	
EGETATION (E (as mapped):	.30/ 11.	3 35	RF (c	observed):	1. 3.35	-		
ieneral vegetation desc	ription:	in ole	dan	alling				
	e	ve pia	Dan Noo	en contra				
aver^ Cover*	Height Ra	nge	Dominant spec	ies*		n	aver F T1 T2 T3 S1	\$2.61
TI S	14-1	14	Euc pla, 1	Cor Cla,	Cor tes	t-	_,, _,,,,,	,, •]
Ta S	6 -	12.	TI SPP. 1	la cor				
<u>\$1 ,5</u>	1.5	-3	Ziz Mou	Gre as	i", Pas f	or", Arg N	21*	
(D palcuss)	)	and the first late the second late are a						مر
G D	0-1	. 2	Alt Lic*,	pas per,	Stynam.	, pet cor	~	****
A new we see not	hilf has bee hef had bee into any has any new her					a lang peng peng mang mang peng peng peng peng peng peng peng	the last two had lost has not any two two had had not out the same out a	
		¥					ا هي جو من علي المراجع علي الجو التي الذي الذي العام التي العام التي العام العام العام العام العام ا	
						t pill pill pill den dör för sen som sen ble den om som sek som		
ANDFORM	Situation	*.	Pattern*:	Slope p	osition*:	S	ope angle:	
OU (1	<b>D</b> 11 (-	6	LP		+			
Votes	Depth: {D	eep/Shallov	w/Skeletal} Text	ure:		Colour:		
votes:			C	agrican		brann		
DISTURBANCE Sev	/erity/Exter	t^  Notes	(info source, fire	scar height.	time since ev	vent)		
Fire	6	{scorched	trunk/some crow	/n death/mu	ch crown de	ath}		
.ogging / clearing	0			den lan ger als for ang ang an dar for Da for di				
Ion-native plant cover	3W	- 167 km. kw kw km km m. yn yn yn m. Y				r was lood from low, long man, some long hand han dans some		in dies hen hieh ben aus imm ben han imm and imm han i
Grazing	RW		af dan dan din din dan dain tan sam ank ana dan ana ana ana ana ana ana				ilin Min Min Mil dan din Mil dan jina ang gab yan pak ina yan gip pal aya y	
eral diggings	0			Alle bild dad lind had like dall dier like das dae ook date				is and the line line play has been been per part (or )
rosion	6			an in die die die die hie offen die an ein an die auf		This dark fair too did Alle also one was not been un one has		
itorm	0							
luman litter/waste	0							
nfrastructure		{building/	road (tracks/fence	e}	,			
Artificial noise/light	-	{noise/lig	ht}	lan lan jan ani ang jan lan lan lan jan jan jan ani ya	ar bie, bie hie an bie an. Mit die lan das im im im			1. 101 101. 101. 101. 101. 10. 10. 101. 101. 101. 101. 101.
Other								
C		1411 4144					("	
Severity: (U nii) - 3 (severe); E	ICC ARLINI	a (L) / Wides	pread (W); Into. Sourc	e: Direct obs. (	#) / Anecdotal (	@) / Combinatio	n (#@)]	
	Abundance			Waterh	ody: (Marine)	/Estuarine /Rive	rine/Palustrine/Lac	ustrinol
arge (>10cm) tree hollo	ws 3	- Notes		{Drv/Fill	ng/Receding/l	Jnknown or Ne	utral}   {Still/Flov	ving}
mall (<10cm) tree hollo	ws 5		n an	{Natural	/Modified}	{Pugging/Heav	y Grazing/Light Gra	izing}
allen logs (>10cm diam	) 3	: Nor We He had the He has he he had he	10 Nov Text Nov Text Not Quil Nov Not Nov Nov Nov You You have here have no h	Clear/T	urbid/Surface I	Film Oil/Surface	Film Organic}	
Course litter (>2cm diam	.) 4			Notes:				
ine litter (<2cm diam.)	5				MA -			
Decorticating bark	3	) han dite tim tak inn silk inn silk inn silk inn si						
ryptogam	Ø							
oil cracks	<u>Ø</u>			-				
tones (20-60cm)	0		a ann ann 40. MC 40. An AN 40. AN	<u>Caves:</u>	{Deep/Sh	allow/Overhan	g/Crevices/Boulder	Piles}
ouiders (61cm-2m)	12	C has been held had see, too, had here goed here "goe	a june mar tona june june june june june june june june		NA.			
arge boulders (22m)			u MP das dat day Mk ya Mk Ma Ad has aya das Jan ada his Na ak (ya y	Ratio	ass/forh (%)			
ctive flowering (T & S)	-	t bill gele der 100, den ple dyn pen der som so		natiog	<u>433/1010 (70)</u>	20/80		
Other	and the log of the lot of person per ling.			Ground	cover (%): B	are Ground · H	Rock : Litter : Live	
Well with how, but days land, but haar but pay him ham him gon him. Bay,		) (ma (bat ina ini) (bat ina ina ina ina ina ina				ω, <b>Σ</b> .'	6:5 90	
				CWD (5	Om transect)			
Abundance: Nil(0), 1(Rare), 2(	Rare/Occasion	nal), 3(Occasio	onal), 4(Occasional/Co	ommon), 5(Con	mon). 6(Comm	on/Abundance)	7(Abundance)	

Project number/name:	135037		Project location	HAS2					
Site name: KC_ 48		Date: _	Date: 11/12/21 Observers: pw, PB.						
Latitude: - 19 . 925596	Longitude:	Datum: 5:42. WSG81	Photos:	North: 631 East: 632	South: South: West: 6 3 1				
VEGETATION	7/113	9	PE (obcom/od):	113.9					
General vegetation desci	rintion:		RE (Observed).						
Gocpa & Cord	cia domi	inated open i	000 000		¢				
Layer^ Cover*	Height Rang	ge Dominan	t species*	彭	[Layer: E, T1, T2, T3, S1, S2, G]				
70 8		Placas	Gla Osi	TI Spaciel	7:2 MARY				
	6-10	1 500	CAL CIC OP	P		e bir pro ing ing ing ing ing ing i			
<i m<="" td=""><td>3-4-</td><td>Qu vit</td><td>Die Cor</td><td></td><td></td><td></td></i>	3-4-	Qu vit	Die Cor						
A	0-1-5-	Nine Me	x 4 Het LOG	Lin Quar	T: ALOY				
		J							
LANDFORM	Situation*:	Pattern*:	Slope po	sition*:	Slope angle:	it pile tille ade pile pile jän ditt. All p			
	B		LP	F	approximation and a second sec				
SOIL (topsoil) Notes:	Depth: {Dee	p/Shallow/Skeletal}	Texture: Scroly loan	Co	lour: ten/browsn				
DISTURBANCE  Sev	erity/Extent^	Notes (info source	e. fire scar height. ti	me since even	t)				
Fire	100 15	corched trunk/som	e crown death/muc	h crown death	) old fire score				
Logging / clearing	ð	The second							
Non-native plant cover	21.1	h thù Mor Mil Mil Mor Mil Mil Mil Mil Mil Mir Mir Mil	n die ben Wilh Ven ben bei bie Wil Wil Wil Wil bei bei Ben als ben Uit Will Wen Wil Wil. W	L MC Ton Sal, Inc. m., Sal MC MC MC MC MA MA MA MA MA MA	No Mile Mile Mile Mile Mile Mile Mile Mile	a lane yan Ayna lana yan lana kan Alan A			
Grazing	XV		a na an						
Grazing Forel dissings	<u> </u>	r (=) maa like diik lina aka like like like na maa kan ake kan dan liki kan mer dia. Am tare m							
reral diggings	<u> </u>	a jûn jihe liya maa sen sela. Hen deg ang gen den om jihe ling wie met der som dan him him				a lan dia dia 110 km lan lan dia dia km k			
Erosion		. We be us to be be lot up hid in the in its in the in the lin the his me as in m	d the bul bin has the but had inco has has has her bin her has but her bits with had its	a 199 kin die het 199 kie die het sin die die die die die die die die	er, hu Mi	r has fan hin ffer van hin fan hie hie			
Storm	Q		a vil, ivii ilas ais 100 fan juu ian line pin laid iuu ant 600 ian line fan die ian ian	n dan dala dan pina dan dan yan lan apin dala ada ana dan alan din	an air 18a 18a 18a an				
Human litter/waste	0								
Infrastructure	<u>    L  {b</u>	ouilding/wad/tracks	s/fence}						
Artificial noise/light	1 [n	oise/light}	ad	- Him Man Yan, San, San Wall also Han Mile Sar, Min Mile Alle Also Also Han					
Other									
(Severity: (0 pil) - 2 (severe): Fr	tent: Localised /I	I) / Widespread (W/): Inf	o Source: Direct obs. (#)	(Anacdotal (@)	Combination (#@)]				
HABITAT CHARACTERISTI	CS - ABUNDA	NCE	5. 30urce. Direct 005. (#)						
Feature	Abundance^	- Notes	Waterbo	dv: {Marine/Est	uarine/Riverine/Palustrine/Lacustrine}				
Large (>10cm) tree hollow	ws 🤋		{Drv/Fillin	g/Receding/Unk	nown or Neutral}   {Still/Flowing}				
Small (<10cm) tree hollo	ws S	n baya baga bana hana ayaan da an bana anan bana bana anan anan	Natural/N	Modified}   {Pi	Igging/Heavy Grazing/Light Grazing				
Fallen logs (>10cm diam		i his line has bin had hit his his line had has had hit his his had has bee hid his our ha	{Clear/Tur	bid/Surface Film	Oil/Surface Film Organic}				
Course litter (>2cm diam	(   .) @	- 294 year and and and any set of an and the state of the	Notes						
Fine litter (<2cm diam )					Last .				
Decorticating bark			e mar agu man mar ann mar mar gur mar gun man						
Cryptogam	6	, MA, MA, MM, Mar, Kar, Kan, Jan, HA, MA, MA, MA, HA, JAN, MM, HA, MM, MA, MA, MA, MA, MA, MA	No. 144. Pile. Nov. Bab. Nov. Don Date have and						
Soil cracks	0								
Stones (20-60cm)	0	yng haf. Dae nam agu, pan de' Mili yn, pan yn, dan yne pan han Am pan yn, gyg gyd yn	Cavec	{Deen/Shallo	w/Overhang/Crevices/Boulder Diles				
Boulders (61cm-2m)	0	. Die 1647 Die Ore Ven. Diel Ven beit Die 1688 Die 1688 ders 1000 UD- Die 2607 des dem ge		(Deep/ Shallo	w, overhang, elevices, bounder Files}				
Large Boulders (>2m)	3	i han dha lind lind line blir, line han line, 'yan l <u>ine</u> iyan han, hine dan had line, iyan iyan jug	e mee laan Yuu-alani kee-alani kee han kee han kee	ALLA					
Exfoliating rock		- Mil Bar (M. Chr Ch Mr Ch. Chr Chr Chr Lab Jan Jan Dir Chr Chi Mil Ab Ab An In	Ratio pra	ss/forb (%)	www. Law -				
Active flowering (T & S)		****	1.000 810		10/3:0				
Other			Ground	over (%): Bare	Ground : Rock : Litter : Live				
Der Win bin bin im jug bin igt fin bin B	and the first part has per two two the first the first the	- WE WA MA PP- NA W- WE DR AN 275 tas ha MA MA MA PA NO- DR NA 265 tas he	LEELEENE GIVANA (	Durch Durch	5:0:2:90				
			CWD (50	m transect):					
Abundance NU(A) (Deva) 34		2/00000100011 4/00000	ional/Common) 5/Carrie		Abundance) 7(Abundance)				
Site sketch (notos:	nare/ Uccasional)	, stoccasional), 4(Occas	ional/common), 5(Comr	non), a(common/	Avundance), /(Abundance)				
SILE SAELLIY HULES:									

Project number/name:	135037			Project	location:	HPS2			
Site name:	(Itas	(e -p+)	Date: 2	1/4/21		Observe	ers: Que	5 . 90	
Latitude: - 19 .926 0 71	Longitude	" 218746	Datum: ws4:	84	Photos:	North: G	38	South: South: West: Duel	
VEGETATION	1 2 75	1112	786			11.22	el /11 ;	120	
RE (as mapped):	1000	0/	T	RE (obse	erved):	1100	10/11 3	1004	
General vegetation descri Eux ter daminated it middle of Channel	iption: purch Ve	jetation	0	nu c	JOIN KES ,	Sandi	j river	- feed	Mol vin In
Layer^ Cover*	Height Ra	nge	Dominant	t species*				[Layer: E, T1, T2,	T3, S1, S2, G]
		2	N. L'MA	a act 1	- Cae	Lor A	- A.	<b>M</b>	
TZ M	0-4	<u>M</u>	YV2 tom	A PANLY	11	- 100 - 17	there.	4 m. 14	na lina kat dina lain jun lini apit dina gan 100 kat din lina aki dina kat dina dipit napi gat kan lain lina da
21 2	T	- MA 	the v	131-	Je app.	A C	Gent 3	101 303	
	0-1-3	<u>7 1945</u>	Mag ma	1 - 1	A THO	- Mart	Coetta		
. No der der her met die het det het het die die die der her het met die and der het het met die het het die die	den des 160 kan des san hat een oor seit kar im	***							
mil nu lus na nu ha na mi ha lus na mi na ha lus na na ha lus na ha ha ha ha hu hu na mi na na n	- NO THE NO. IN: NO OF NO THE R THE D	an me me me sar nu nu ka. Ine ha he he he ine f	, they have been been have been start and then then t	a lana kere lana lana kere hara lana lana lana lana lana lana	a berten hin bet en nij bet het Dit bat bet der b	aan gang begat gang lanay Mana gand Mana, Tanga Mala Mad	a Tala kan, Mad kan, Mad kan kan kan kan kan Mili ka		
			- Alle film 1989 ages fight data gave was soon gave and	, gin qui den des lins lins des lins des aut					***
lik, dak air lie bin na lair ar an lar fan an dak bin hair han lait din lair bin dan dan an an ant han air din t						m. m. un m. m. in int or m- or or	is the affe and and and and and and and and		
	Situation*	ŧ.	Pattern*:		Slope posi	tion*:		Slope angle:	
	8	•	LP					Jope	
SOIL (topsoil)	Depth: {De	eep/Shallow/	/Skeletal}	Texture:	:		Colour:		
Notes:				Sa	for		l s	may Itan	2
				6			-	" - U / ·	
DISTURBANCE Seve	erity/Exten	it^  Notes (i	info source	e, fire scar	r height, tim	ie since ev	/ent)		
Fire	8	{scorched t	runk/some	e crown d	leath/much	crown de	ath}		
Logging / clearing	G							,	
Non-native plant cover	20	around	COVER	No. 2014 The life life life and the sec-	- Mit fan har fall fan fan fan hat Mit On oan oan	na hea bha line bha bhil bha na an an	e lan had bin an on be lan an or an	a ya iyo iyo iyo iyo iyo ina ina ina ina ina iyo iyo an an ya ya u	
Grazing	8	9-				yn han yn, an dip (m jús din blâ bla dir			
Foral diggings	6								
Gracian	1.0		ann de' rek ann ann dan dan dan dan dan dan dan	particular and and and and the first out			a nan ana ana ana ina ina ina ina kao na kao na kao na	n he mic die im die Deran bei die bit he Oit im his het O	
Ctorm		tions and the VIV has been had been into the	harf war fan han har ha. Yan line am han aar b	ins. Her has the first has the lost line. Inst	J had have blar last. That they lath sum have limit had un	as has but has but hit his to- are the the	s not have mo one low now has been had been been been been been been been bee	y we get the first for including the second field including both in	a martina han bar mar mar sara bar bar har har bar bar bar bar har mar har bar bar bar bar bar bar bar bar bar
Storm	- <u>C</u>				e del bas del gal der gis an inn am die ges inn ar	pe que aque pei las, illa jan aix ins las las	- in In		e ma qa qa qa ta ta ma ma ma ma ta ta da da ma qa ta ta ta ma da ma ha dha dha ha ma
Human nucly waste		(huilding/r	and /tracks	/fonce}	·		, pa, and ph. pas ing ada pair of any in the		
Intrastructure		{Dunung/is	Jau/Liacha	/Tencer			1 M B 40 M N 9 N 9 N 9 N 9 N 9	*************	
Artificial noise/light		{noise/lignu	:} ro	40		ta, 18., 19., 19., 19. (19. fac in., 19., 40. fac	r 100. an. 100. 100. 100. 100. 100. 100. 100. 10	n. Yan, man lam, man lam, lam, man law lain lain, lam, lam, lain, lain, lain, lain, lain, lain, lain, lain, lai	in law law ani am law law any ang kan law lak law lati lati lati lati lati lati ang $\mathcal{D}_{1}$ ang tin pak lan gan lati l
Other	1	l							
		···· / widesnr	Infr	Courses D	·* · · · · · · · · · · · · · · / /	* datal (i	C) (Combin	·· (#@\]	
[Severity: (U nil) - 3 (severe), EAL	tent: Locauses	d (L) / Widespin	ead (w); mis	). Source: D	irect ops. (#) /	Anecootal (	@) / Comon.	ation (#@)]	
HABITAT UTAKACTERIST	LS - ADUNE	JANCE			Motorhod	- (Marine,	"-tuarine/	- A /Dalustrii	- 4
Feature	ADuliuanee	in - Notes			/Dry/Filling/	V. (IVIALIUS, /Deceding/(	/EStuarney.	Noutral}   {St	ill/Elouine)
Large (>10cm) tree hollow	VS		Nor that only shift then that then that have bell how a	diet das üb- also het bill son das las, bill	Matural/M	neceding,	Junoping/	Jeavy Grazing/Lif	the Grazing
Small (<10cm) tree none.	vs		an an an in in an in a that in a bar	and two law law law law law me has not	IClear/Turb	M/Surface	استة منطقة الت LE Mobilie	face Film Organi	
Fallen logs (>10cm diam.)					Alataer	lu/Junace .	Fillin Ongou.	Idue i ini orgeni.	-1
Course niter (-2cm diam )		( for the part left pr. He is in the He is in the life			Notes.	in five	ar As	aar W	6_20/WE_13
Fine litter (<2cm mann)	····		- and the state the life and the stat life and i	- MAR MAR MAR AND MAR MAR AND MAR AND	DUIN-	un .	tan Sili ∎ora 	t for	
Decorticating bark		a kapa lana juan juan kata kata kata kata kata kata kata k	- Ine Bie Bie Bie Ine Bie Mie Bie darf has No. 1	- Mill Mar Mar May Mrs Mill Mar Mile and An-	A States	สรณาอิงาป			
Cryptogam	- <u>R</u>								
Soil cracks	<u> </u>		ter ter melle ter militation de tet ter			(7/Sh	"/Over	Constitute /B	11 511-1
Stones (20-60cm)	Ge	- 1.0 m. pt. pt = 1.0 m. pt. pt = 1.0 m. pt. pt = 1.0 m. pt. pt. pt. pt = 1.0 m. pt. pt. pt. pt. pt. pt. pt. pt. pt. pt		we are been an inclused and and for the	Caves.	{Deepyon	allow/oven	hang/Crevices/ Do	oulder Piles}
Boulders (61cm-2m)		The last has the local test line and the last line and	-per der Der aus beft der abe abb aus abb.	. We get the last not per last per last not	a ta.	NA.			
Large Boulders (>2111)			AC C. 10 TO B. 10 IN C. 10 AN		Potio graci	14 (%)	-		
Extoliating rock			and and also fees for the set of the set		Katio grass	5/TOFU [/0]	÷ 70,	130	
Active flowering (1 & 3)		) yes her for her an dir till the her tee per her	a nha dan bah Min Bad Mad Min Mit Man dan bar		Conversed on	(0/)+ B	Group	I - Deak + Littpr	
Other		, han, ata han ber jeu bir im im pen dia per jeu	, pan agn lign finn finn lign lign lign god lifn fing	) by spings in the last the list line	<u>Grouna co</u>	Ver (70). D	are Ground	d: KOCK : Liller	: Live
	1 1	1					3.	- · · ·	
· ~	1 1	l			CWD (50m	i transecu			
[Abundance: Nil(0), 1(Rare), 2(R	lare/Occasion	nal), 3(Occasion	nal), 4(Occasi	ional/Comm	non), 5(Commo	on), 6(Comm	ion/Abundar	nce), 7(Abundance)	)
Site sketch/notes:									

Project number/name:	13503	7	Project location	HPS2.	
Site name: $\mathcal{R}\mathcal{C}$ - $\mathcal{S}\mathcal{C}$	5	Date:	21/11/21	Observers:	PB, RW-
Latitude:	Longitude	e: Datum: 6903 WS	Photos:	North: 643	South: 64 4 West: 64 6
VEGETATION	2 20/	11225		Edst. 000	West.
RE (as mapped): 14	J O /	11 9 99	RE (observed):	h 0, 00	
General vegetation desci EUC Pla Domin	iption: alref 4	open woodland	of with Cor	tes, corch	a
Layer^ Cover*	Height Ra	ange Dominar	nt species*	ecla	[Layer: E, T1, T2, T3, S1, S2, G]
FA O	6-10	Nh Ca	TI convis	Mis and (1	- ac + les ext Do his
- Jok	2-4	- MA	ADIX ALLANS	TY MARIEN	ic still all the state
<u>G</u>	0-1-5	Mag 1	Max" Tri the	thet Gen,	Ge jor*
LANDFORM	Situation	*: B Pattern*	: Lf Slope po	sition*:	Slope angle:
<u>SOIL (topsoil)</u> Notes:	Depth: {D	)eep/Shallow/Skeletal}	Texture: Sandy los	Colou	r: tean/brown
DISTURBANCE Seve	erity/Exter	nt^  Notes (info sour	ce, fire scar height, ti	me since event)	
Fire	14	{scorched trunk/son	ne crown death/muc	h crown death}	
Logging / clearing	6				
Non-native plant cover	36	Coursed lange		is hine him him 1005 1005. Hild him hide has not shill him him him him you was	
Grazing	f (a)		) that when this data that ally 100-data half also much film data pitch from max. Here may both the here		
Foral diggings					
Gracian	8				
	hhanharaha	(c.) The boy ing her her her into me, and had her hed her, has not me had now had her ind her now her	) has the HP MP bits but hits the sam the line has bee and his size the that $\widetilde{s_{\rm eff}}$ has the HP MP	d The Mat hav Dr. MD MD day the She had the MC has No. Inc. Sole Day has no	
Storni			/ has bee hilf for two link out you has has one flow him has has bee first out one of the sec	n lith And lan dan ann lan an' die jan and ann dag yng ger gar gar ger ger ger	
	<u>-</u>	(introduced/track	16		
		{building/roau/uach	(s/tence)		
Artificial noise/light	· · · · · · · · · · · · · · · · · · ·	{noise/light}	200		
Other					
[Severity: (0 nil) - 3 (severe); Ex	tent: Localise	ed (L) / Widespread (W); In	fo. Source: Direct obs. (#)	/ Anecdotal (@) / Cor	mbination (#@)]
HABITAT CHARACTERISTI	CS - ABUN	DANCE			
Feature	Abundance	æ^ - Notes	<u>Waterbo</u>	<b>dy:</b> {Marine/Estuari	ine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollov	NS 2		{Dry/Fillin	g/Receding/Unknow	vn or Neutral}   {Still/Flowing}
Small (<10cm) tree hollow	NS 4	and the last by last her the last of the method has been been been been been been been bee	{Natural/N	Vodified}   {Puggi	ng/Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.)	Í Í	[	{Clear/Tur	rbid/Surface Film Oil	l/Surface Film Organic}
Course litter (>2cm diam.	1 5		Notes:		
Fine litter (<2cm diam.)	6			NA	
Decorticating bark		Jan de la construir de la cons	the law we have the law has had him part in		
Cryptogam	Ò		jad har jak hit yes ng an ang an an an an an an an an		
Soil cracks	0				
Stones (20-60cm)	0		Caves:	{Deep/Shallow/C	Overhang/Crevices/Boulder Piles}
Boulders (61cm-2m)	0		the fact and the first the second sec	A. 14	-
Large Boulders (>2m)	0		har har m. m. m. m. m. m.	1.40	
Exfoliating rock			Ratio gra	iss/forb (%):	a.f.m
Active flowering (T & S)				/	18/ 30
Other		10 An Alf Rai Mi Ha, An	Ground c	:over (%): Bare Gro	ound : Rock : Litter : Live
			21412 /20		1.0.7:62
			<u>CWD (50)</u>	m transect):	
[Abundance: Nil(0), 1(Rare), 2(R	lare/Occasion	nal), 3(Occasional), 4(Occa	sional/Common), 5(Comm	non), 6(Common/Abu	ndance), 7(Abundance)
Site sketch/notes:					

Site name:       RE (=	Project number/name:	135037	Project locatior	n: 14052
Latitude:       Longitude:       Datum:       Photos:       North: GLL       South: GLL         19.462504       (L7) 1/1/619       Los 5/ 5/4       East: GLL       West: GLL         RE (as mapped):       (L3 9       RE (observed):       [L3 - 7]         General vegetarion description:       GLL       GLL       [L3 - 7]         General vegetarion description:       GLL       GLL       [L4 - 7]         Gue GAL       Cover*       Height Range       Dominant species*       (Layer: F, TI, T2, T3, S3, S2, 6]         TL       Sold -	Site name: $RE = 51$	D	ate: 21/4/21	Observers: Qw, PG
Image: Second		Longitude: D	Jatum: Photos:	North: 626 South: 627
Viscol 1000       III 3 9       RE (observed): III 3 7         General vegetation description: Gut dat control of the second of the secon		(AUCCIDE)	TOPEN	East: 00% west: 627
Att [3] impletely:       In the justice of the second	VEGETATION	9	DE (observed)	11. 2.7
Concert       LayerA       Convert       Convert       LayerA       Convert       LayerA       Convert       LayerA       Convert       Convert       Convert       LayerA       Convert       Co	Re (as mapped). 11 -	intion:	NE (UDSEIVEU).	
Layer*       Cover*       Height Range       Dominant species*       [Layer.E, TL, TZ, T3, S1, S2, G]         I. S. I. J. I. Z. S. T.L. Max*       Crew SHT. Error end       Sile Covert       Sile Covert         I. J. I. Z. S. T.L. Max*       Crew SHT. Error end       Sile Covert       Sile Covert         I. J. I. Z. S. T.L. Max*       Crew SHT. Error end       Sile Covert       Sile Covert         I. ANDFORM       Situation*:       Bettern*:       Sile position*:       Slope angle:         SOIL (topsoil)       Depth: (Deep/shallow/Skeletal)       Texture:       Colour:         Note:       Distruments' (Coverty/Extent*) Notes (Info source, fire scar height, time since event)       Fire         Fire       [scorched trunk/some crown death/much crown death]       Sologe fire Scar height, Starter         Non-native plant cover       Sweethy: (Init: / waste       Sweethy: (Init: / waste         Infrastructure       (building/road/tracks/fence)       Artificial noise/light       (building/road/tracks/fence)         Artificial noise/light       (building/road/tracks/fence)       (Dir/Filling/Receding/Monor or Neutral) (SWI/Fowing)         Storm       [waterbody: (Marine/Estuarine/Neverine/Palustrine/Lacustrine)       (Dir/Filling/Receding/Monor or Neutral) (SWI/Fowing)         Storm       [waterbody: (Marine/Estuarine/Noverine/Palustrine/Lacustrine)       (Dir/Filling/Reced	for day comine	the open wo	odland on allund	al plains
T1       10-15       Gree Call (Gr. Terminal (Gr. Terminal Call (Gr. Terminal (Gr. Terminal (Gr.	Layer^ Cover*	Height Range D	ominant species*	[Layer: E, T1, T2, T3, S1, S2, G]
S1       1.2.5       7.4.1       Mexil: Crij gat         G       0.2.5.5       Sij gat       Sig gat         G       0.2.5.5       Sij gat       Sig gat         G       0.2.5.5       Sig gat       Sig gat         G       0.2.5.5       Sig gat       Sig gat         GUI (topsoil)       Depth: (beer/shallow/skeletai)       Texture:       Colour:         Notes:       0.5.5       Gat       Gat         DISTURBANCE       Iseverity/Extent^I Notes (info source, fire scar height, time since event)       Fire         Fire       0.5.5       Gat       Gat         Non-native plant cover       Gat       Gat       Gat         Storm       1.4.5       Gat       Gat       Gat         Antificial noise/light       1.4.5       Gat       Gat       Gat         Storm       1.4.5       Gat       Gat       Gat       Gat         Storm       1.5.6       Gat       Gat       Gat       Gat	<u>TI 5</u>	10-15 M	EVE Day, Lor 19	
SI       0       1-2-2-3       Zat. Maxi. Crij glas.         Grand       0       0-0-2-5       Sky Sort. Sky Assa.       He CarA. Ulio Assa. Do jag.         LANDFORM       Situation*:       8       Pattern*:       Image: Slope position*:       Slope angle:         LANDFORM       Situation*:       8       Pattern*:       Image: Slope position*:       Slope angle:         LANDFORM       Situation*:       8       Pattern*:       Colour:       Image: Slope angle:         JOII (topsoil)       Depth: (Deep/Shallow/Skeletal)       Texture:       Colour:       Image: Slope angle:         JOISTURBANCE       ISeverity/Extent^1 Notes (Info source, fire scar height, time since event)       Image: Slope angle:       Image: Slope angle:         Fire       0       {scorched trunk/some crown death/much crown death}       Image: Slope angle:       Image: Slope angle:         Jongrag       1       (deaved trunk/some crown death/much crown death)       Image: Slope angle:       Image: Slope angle:         Storm       1       deaved trunk/some crown death/much crown death/much crown death       Image: Slope angle:       Image: Slope angle:         Infrastructure       0       {building/road/tracks/fance}       Image: Slope angle:       Image: Slope angle:       Image: Slope angle:         Infrastructure	T2 V	6-5M	CHE SHT EVE ON	
Grand Structure       Grand Structure       Slope position*:       Slope angle:         Solid (topsoil)       Depth: (Deep/Shallow/Skeletal)       Texture:       Colour:         More:       Colour:       Structure       Grand         DISTURBANCE       [Severity/Extent*] Notes (Info source, fire scar height, time since event)       Fire         Fire       Scorched trunk/some crown death/much crown death}       Colour:         Logging / clearing       Scorched trunk/some crown death/much crown death}       Colour:         More:       Storm       Scorched trunk/some crown death/much crown death}       Colour:         More:       Storm       Scorched trunk/some crown death/much crown death       Colour:         More:       Storm       Scorched trunk/some crown death/much crown death       Colour:         More:       Storm       Scorched trunk/some crown death/much crown death       Colour:         More:       Storm       Scorched trunk/some crown death/much crown death       Colour:         Storm       I.W.       Scorched trunk/some crown death/much crown death       Colour:         Storm       I.W.       Scorched trunk/some crown death/much crown death       Colour:         Storm       I.W.       Scorched trunk/some crown death/much crown death       Colour:         Storm	<u>sl 9</u>	1-213 M	Zie Mau or gra	······································
LANDFORM       Situation*:       Pattern*:       Slope position*:       Slope angle:         SOIL (topsoil)       Depth: (Deep/Shallow/Skeletai)       Texture:       Colour:       Arrive angle:         Notes:       Order       Order       Arrive plant cover       Arrive plant cover       Arrive plant cover         Non-native plant cover       Arrive plant cover       Arrive plant cover       Arrive plant cover       Arrive plant cover         Human litter/waste       Arrive plant cover       Arrive plant cover       Arrive plant cover       Arrive plant cover         Human litter/waste       Arrive plant cover       Arrive plant cover       Arrive plant cover       Arrive plant cover         Human litter/waste       Arrive plant cover       Arrive plant cover       Arrive plant cover       Arrive plant cover         Human litter/waste       Arrive cover       Arrive plant cover       Arrive plant cover       Arrive plant cover         Human litter/waste       Arrive cover       Arrive cover       Arrive cover       Arrive cover         Mother       Arrive cover       Arrive cover       Arrive cover       Arrive cover         Severity: (0 nil) -3 (severe):       Extent: tocalsed (U) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]       Harryver         Harry Cover       Abundan	<u> </u>	0-0.15	Sty son any man	a Hat Con Uso mess sure jay
LANDFORM       Situation*:       Pattern*:       Slope position*:       Slope angle:         SOIL (topsoil)       Depth: (Deep/Shallow/Skeletal)       Texture:       Colour:         Notes:       DisTURBANCE       [Severity/Extent^] Notes (info source, fire scar height, time since event)       Fire         Fire       Storched trunk/some crown death/much crown death)       Iogging / clearing       Non-native plant cover         Non-native plant cover       Swi       Storched trunk/some crown death/much crown death)       Forestime         Infrastructure       (building/road/tracks/fence)       Forestime       Forestime         Artificial noise/light       (Gilse/light)       Place         Other       Severity: (b nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       Waterbody: (Marine/Estuarine/Riverine/Palustrine/Lacustrine)         Izarge (>200cm) tree hollows       (Dry/Filling/Reccding/Unknown or Neutral)   (Still/Flowing)         Small (<10cm) tree hollows				
SOIL (topsoil) Notes:       Depth: {Deep/Shallow/Skeletai}       Texture:       Colour:         Notes:       Image: State in the stat	LANDFORM	Situation*: B	attern*: Slope pr	osition*: Slope angle:
Notes:       Org       Arrows         DISTURBANCE       [Severity/Extent^] Notes (info source, fire scar height, time since event)       Fire         Fire       [scorched trunk/some crown death/much crown death]       Logging / clearing         Non-native plant cover       3 w         Grazing       [w]         Feral diggings       [scorched trunk/some crown death/much crown death]         Logging / clearing       [w]         Storm       [w]         Human litter/waste       [building/road/tracks/fence]         Artificial noise/light       [fw]         Other       [building/road/tracks/fence]         Artificial noise/light       [fw]         Other       [Severity: [0 nil] - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       [Severity: [0 nil] - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       [Severity: [0 nil] - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HaBITAT CHARACTERISTICS - ABUNDANCE       [Severity: [0 nil] - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         Grage [sther (>2 com diam.)]       [Ory/Filll	SOIL (topsoil)	Depth: {Deep/Shallow/S!	keletal} Texture:	Colour:
DISTURBANCE       [Severity/Extent^  Notes (info source, fire scar height, time since event)         Fire       [scorched trunk/some crown death/much crown death]         Logging / clearing       [scorched trunk/some crown death/much crown death]         Non-native plant cover       3.00         Grazing       [scorched trunk/some crown death/much crown death]         Feral diggings       [scorched trunk/some crown death/much crown death]         Feral diggings       [scorched trunk/some crown death/much crown death]         Storm       [scorched trunk/some crown death/much crown death]         Human litter/waste       [scorched trunk/some crown death]         Storm       [scorched trunk/some crown death]         Human litter/waste       [scorched trunk/some crown death]         Storm       [scorched trunk/some crown death]         Human litter/waste       [scorched trunk/some crown death]         Infrastructure       {building/road/tracks/fence}         Artificial noise/light       [scorched trunk/some crown death]         Other       [scorched trunk/some crown death]         Iseverity: (0 nil) - 3 (severe); Extent: localsed (U) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       [scorched trunk]         Feature       [Abundance^- Notes       [Scorched trunk]/Modifield] <td>Notes:</td> <td>and the second se</td> <td>Chy</td> <td>grown.</td>	Notes:	and the second se	Chy	grown.
Fire       [scorched trunk/some crown death/much crown death]         Logging / clearing       Non-native plant cover         Non-native plant cover       W         Grazing       Iw         Feral diggings       Iw         Erosion       Erosion         Storm       Iw         Human litter/waste       Im/startucture         Artificial noise/light       [double fracks/fence]         Artificial noise/light       [double fracks/fence]         Artificial noise/light       [double fracks/fence]         Building/road/tracks/fence]       Artificial noise/light         Jacks       [double fracks/fence]         Artificial noise/light       [double fracks/fence]         Human litter/waste       Im/structure         Artificial noise/light       [double fracks/fence]         Artificial noise/light       [double fracks/fence]         HABITAT CHARACTERISTICS - ABUNDANCE       [severity: (0 nil) - 3 (severe); Extent: Localised (U) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       [severity: (0 nil) ree hollows         Smail (<10cm) tree hollows	DISTURBANCE Sev	erity/Extent^  Notes (inf	fo source, fire scar height, f	time since event)
Logging / clearing       Non-native plant cover         Non-native plant cover       3 vv         Grazing       1 vv         Feral diggings       1 vv         Erosion       0         Storm       1 vv         Human litter/waste       0         Infrastructure       (building/road/tracks/fence)         Artificial noise/light       1         (going/light)       1         Other       1         Userity: (0 nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       Vaterbody: (Marine/Estuarine/Riverine/Palustrine/Lacustrine)         Feature       Abundance^ - Notes       Vaterbody: (Marine/Estuarine/Riverine/Palustrine/Lacustrine)         Large (>10cm) tree hollows       (Dry/Filling/Receding/Unknown or Neutral)   (Still/Flowing)         Small (<10cm) tree hollows	Fire	Scorched tru	nk/some crown death/mu	<pre>ich crown death}</pre>
Non-native plant cover       3 wu         Grazing       Iwu         Grazing       Iwu         Feral diggings       •         Erosion       •         Storm       Iwu         Human litter/waste       •         Infrastructure       •         Artificial noise/light       •         Other       •         Other       •         HABITAT CHARACTERISTICS - ABUNDANCE         Feature       Abundance* - Notes         Waterbody:       (Marine/Estuarine/Riverine/Riverine/Palustrine/Lacustrine}         Large (>10cm) tree hollows       •         Small (<10cm) tree hollows	Logging / clearing		e bin line time her her nye tim her inn den het fån tils blik blik tim her blie tils blik blik bliv bliv bliv den tils blik blik blik blik blik blik blik blik	
Grazing       Iw         Feral diggings       Feral diggings         Erosion       Storm         Storm       Iw         Human litter/waste       Gased         Infrastructure       (building/road/tracks/fence)         Artificial noise/light       Image: Comparison of the comparison of	Non-native plant cover	3 W		
Feral diggings       Second House         Erosion       Storm         Storm       I.W.         Human litter/waste       Second House         Infrastructure       Storm         Artificial noise/light       I.Gost         Other       Severely: (0 nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE       Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}         Feature       Abundance^ - Notes       Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}         Large (>10cm) tree hollows       Second House       (Dr/Filling/Receding/Unknown or Neutral)   (Still/Flowing)         Small (<10cm) tree hollows	Grazing	lw.		
Erosion       Image: Storm         Storm       Image: Storm         Human litter/waste       Image: Storm         Infrastructure       Image: Storm         Artificial noise/light       Image: Storm         Other       Image: Storm         Iseverity: (0 nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE         Feature       Abundance^- Notes         Large (>10cm) tree hollows       Start (Start)         Small (<10cm) tree hollows	Feral diggings	0		
Storm       Iw       dsext_frass         Human litter/waste       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Artificial noise/light       Improve the second structure       Improve the second structure         Abundance^       Notes       Improve the second structure         Iarge (>10cm tree hollows       Improve the second structure       Improve the second structure         Small (<10cm tree hollows	Erosion	Ø	and the second sec	
Human litter/waste       Infrastructure         Infrastructure       Image: State in the state in t	Storm	IW dood H	1005	
Infrastructure       {building/road/tracks/fence}         Artificial noise/light       {folse/light}         Other       {folse/light}         Iseverity: (0 nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE         Feature       Abundance^ - Notes         Large (>10cm) tree hollows       {Dry/Filling/Receding/Unknown or Neutral}   {Still/Flowing}         Small (<10cm) tree hollows	Human litter/waste	0		
Artificial noise/light       [1035/light]       P(are         Other	Infrastructure	S {building/roa	d/tracks/fence}	
Other	Artificial noise/light	I {noise/light}	Plane.	
[Severity: (0 nil) - 3 (severe); Extent: Localised (L) / Widespread (W); Info. Source: Direct obs. (#) / Anecdotal (@) / Combination (#@)]         HABITAT CHARACTERISTICS - ABUNDANCE         Feature       Abundance^ - Notes         Large (>10cm) tree hollows       {Materbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}         Small (<10cm) tree hollows	Other		1.01.00	
HABITAT CHARACTERISTICS - ABUNDANCE         Feature       Abundance^ - Notes       Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}         Large (>10cm) tree hollows <ul> <li>(Dry/Filling/Receding/Unknown or Neutral)   {Still/Flowing}</li> <li>(Natural/Modified)   {Pugging/Heavy Grazing/Light Grazing}</li> <li>(Clear/Turbid/Surface Film Oil/Surface Film Organic)</li> </ul> <ul> <li>Notes:</li> <li>Notes:</li> <li>Soil cracks</li> </ul> <ul> <li>Caves:</li> <li>{Deep/Shallow/Overhang/Crevices/Boulder Piles}</li> <li>Soulders (61cm-2m)</li> <li>Soulders (61cm-2m)</li> </ul>	[Severity: (0 nil) - 3 (severe); Ex	 .tent: Localised (L) / Widesprez	ad (W); Info. Source: Direct obs. (i	#) / Anecdotal (@) / Combination (#@)]
Feature       Abundance^ - Notes       Waterbody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}         Large (>10cm) tree hollows       O       {Dry/Filling/Receding/Unknown or Neutral}   {Still/Flowing}         Small (<10cm) tree hollows	HABITAT CHARACTERISTI	CS - ABUNDANCE		
Large (>10cm) tree hollows       {Dry/Filling/Receding/Unknown or Neutral}   {Still/Flowing}         Small (<10cm) tree hollows	Feature	Abundance^ - Notes	Waterb	yody: {Marine/Estuarine/Riverine/Palustrine/Lacustrine}
Small (<10cm) tree hollows	Large (>10cm) tree hollow	NS O	{Dry/Filli	ing/Receding/Unknown or Neutral}   {Still/Flowing}
Fallen logs (>10cm diam.)       Image: Clear/Turbid/Surface Film Oil/Surface Film Organic}         Course litter (>2cm diam.)       Image: Clear/Turbid/Surface Film Oil/Surface Film Organic}         Fine litter (<2cm diam.)	Small (<10cm) tree hollow	NS 3	{Natural/	/Modified   {Pugging/Heavy Grazing/Light Grazing}
Course litter (>2cm diam.)       3       Notes:         Fine litter (<2cm diam.)	Fallen logs (>10cm diam.)	/ <u> </u>	{Clear/Tı	urbid/Surface Film Oil/Surface Film Organic}
Fine litter (<2cm diam.)	Course litter (>2cm diam,	.) 3	Notes:	Alia
Decorticating bark       I         Cryptogam       O         Soil cracks       O         Stones (20-60cm)       Caves:         Boulders (61cm-2m)       O	Fine litter (<2cm diam.)	14		LALC: -
Cryptogam     O       Soil cracks     O       Stones (20-60cm)     Caves:       Boulders (61cm-2m)     O	Decorticating bark		2011 Hild van mer war war	
Soil cracks     O       Stones (20-60cm)     Caves:       Boulders (61cm-2m)     O	Cryptogam	0		
Stones (20-60cm)       Caves:       {Deep/Shallow/Overhang/Crevices/Boulder Piles}         Boulders (61cm-2m)       Image: Caves: Caves	Soil cracks	0		
Boulders (61cm-2m)	Stones (20-60cm)	0	<u>Caves:</u>	{Deep/Shallow/Overhang/Crevices/Boulder Piles}
	Boulders (61cm-2m)	6		A4A
Large Boulders (>Zm)   🔘	Large Boulders (>2m)	0		FVI
Exfoliating rock	Exfoliating rock	0	<u>Ratio gr</u>	rass/forb (%): 90/40
Active flowering (T & S)	Active flowering (T & S)			7
Other Ground cover (%): Bare Ground : Rock : Litter : Live	Other		Ground	cover (%): Bare Ground : Rock : Litter : Live
CWD (50m transect):			CWD (5	0m transect):
[Abundance: Nil(0), 1(Rare), 2(Rare/Occasional), 3(Occasional), 4(Occasional/Common), 5(Common), 6(Common/Abundance), 7(Abundance)	[Abundance: Nil(0), 1(Rare), 2(	Rare/Occasional), 3(Occasional	l), 4(Occasional/Common), 5(Con	nmon), 6(Common/Abundance), 7(Abundance)
Site sketch/notes:				

Project number/name:	135037	Project	location: 4952	2
Site name:	Jac Gu	Date: 26/5/2	Observe	irs: Rw
Latitude:	Longitude:	Datum: WSG584	Photos: North: East: 1	17 South: 118 9 1 West: 120
VEGETATION RF (as mapped): (1-	3. 55/11 3 3	් . BE (obse	erved): (1-3.)	1.7
General vegetation desci	iption: Cor SP	Mixed open	woodland	
R.C.		( ÷ . † []	—e-) X (	2 - D - 2
Layer^ Cover*	Height Range	Dominant species*	dat a da	[Layer: E, T1, T2, T3, S1, S2, G]
<u> 11 3</u>	15-19	Cor They Co	Cor Cry	1 Coc pia.
13 <u>2</u>	67 19	7.2 412 28	Ant for *	
GD	A-1.5	Ciu ham*.	LICO MOSE CIAL	int". Alt fic" Mos Sua liet con
	<u></u>	2-3		
was mer mar mer man mer man bant han tan tan tan tan tan mer dan mer han tan tan tan tan tan tan tan tan tan t	nd nam han sam man sam han mad han hanf hanf hanf hanf han din han sam han sam han sam han		har bar me an, m, me an har an me in, har by in, bei ye in the she het tet by bot by the s	
LANDFORM	Situation*:	Pattern*:	Slope position*:	Slope angle:
<u>SOIL (topsoil)</u>	Depth: {Deep/Shall	ow/Skeletal} Texture:	16.000	Colour:
Notes:	Strate Charles and a State	. 0	ay 1100m	Grown
DISTURBANCE Sev	erity/Extent^  Note	es (info source, fire sca	r height, time since ev	<u>vent)</u>
Fire	Scorche	d trunk/some crown d	eath/much crown de	ath}
Logging / clearing	IN TIG	vi To layer	lagely acad	or to the W. Bordellus nor teen
Non-native plant cover	300	~	~	
Grazing	200		و ها الله الله الله الله الله الله الله	· · · · · · · · · · · · · · · · · · ·
Feral diggings	0			
Erosion	0	' laine and ban han mar jure han bait hit little bait han dan bait han hit, bay bait and milli bat, bait milli		
Storm	0			
Human litter/waste	0			
Infrastructure	{building	g/road/tracks/fence}		
Artificial noise/light	O {noise/li	ght}	and the sub- was had sub- top may buy by high large has had been held had bed. All, but high had to	
Other				
	tontu Localicad (I.) ( Mid	corroad (MI): Infa Source: D	iract abs. (#) / Anacdatal (	@) / Combination (#@)]
HABITAT CHARACTERIST	ICS - ABUNDANCE	espread (wy, mo. source. o		
Feature	Abundance^ - Notes		<u>Waterbody:</u> {Marine	/Estuarine/Riverine/Palustrine/Lacustrine}
Large (>10cm) tree hollo	ws <u>3</u>	医联合 化合体 医体育 医肉 医阴间 电气管 医肉 医尿管管	{Dry/Filling/Receding/	Unknown or Neutral   {Still/Flowing}
Small (<10cm) tree hollo	ws 4	a ma hari kan hari kani ma ma ma ma ma ma ma hari kani kani kani kani kani kani kani kan	{Natural/Modified}	{Pugging/Heavy Grazing/Light Grazing}
Fallen logs (>10cm diam.	) 4		{Clear/Turbid/Surface	Film Oil/Surface Film Organic}
Course litter (>2cm diam	) <		Notes:	
Fine litter (<2cm diam.)	<u> </u>			
Decorticating bark	2	. Den mit jes, mit jes jek ins. Im die Da Mit die		
Cryptogam			-	
Stones (20 60cm)		و بين بيه بين من من جو جو وي ور من حو من جو بين من بين من جو من وي وي من بين من بين من ا	Caves: /Deen/St	allow/Overbang/Crevices/Boulder Piles}
Stones (20-bucm)		a man man lana Ma, dala Mal Mal Mal Ma, dagi dan gara kan akri Man dala dala dala dia. Dia apa, dan dala dala M		anowy overhang/crevices/bounder rifes)
Large Boulders (>2m)		n nga man man han man han badi ban han badi bagi bagi bagi bagi badi badi bidi bidi bidi bidi bidi bid		MA.
Exfoliating rock			Ratio grass/forb (%	50/50
Active flowering (T & S)	$\mathbf{r} \rightarrow \mathbf{r} \rightarrow $			
Other			Ground cover (%): E	Bare Ground : Rock : Litter : Live
			CIMD (FOr the second	
(Abundance: Nil(0) 1(Pare) 2(		sional) Alaccasional/Comm	LVVD (SUM Transect	1:
Site sketch/notes:	narey occasional), 3(OCC		הכתן, סנכטווווטוון, פנכסמה	

Appendix I: Likelihood of Occurrence Assessment

Table 1:	Threatened. Near	Threatened, Mig	ratory and S	pecial Least Cor	ncern species likel	ihood of occurrence

	Scientific name	Common name	Sta	Status <sup>1</sup>		Database <sup>2</sup>	
Family			NC Act	EPBC Act	WO	PMST	LoC 3
Fauna							
Birds							
Accipitridae	Erythrotriorchis radiatus	Red Goshawk	E	V	-	Х	Unlikely
Accipitridae	Pandion cristatus (Pandion haliaetus)	Eastern Osprey	SL	М	Х	Х	Possible
Apodidae	Apus pacificus	Fork-tailed Swift	SL	М	Х	Х	Probable
Apodidae	Hirundapus caudacutus	White-throated Needletail	V	V,M	Х	Х	Probable
Columbidae	Geophaps scripta scripta	Squatter Pigeon (southern subspecies)	V	V	Х	-	Probable
Cuculidae	Cuculus optatus	Oriental Cuckoo	SL	М	-	Х	Possible
Estrildidae	Neochmia ruficauda ruficauda	Star Finch	E	E	-	Х	Unlikely
Estrildidae	Poephila cincta cincta	Black-throated Finch (southern subspecies)	E	E	Х	Х	Probable
Falconidae	Falco hypoleucos	Grey Falcon	V	V	-	Х	Unlikely
Laridae	Gelochelidon nilotica	Gull-billed Tern	SL	М	Х	-	Unlikely
Laridae	Hydroprogne caspia	Caspian Tern	SL	М	Х	-	Unlikely
Monarchidae	Monarcha melanopsis	Black-faced Monarch	SL	М	Х	Х	Possible
Monarchidae	Myiagra cyanoleuca	Satin Flycatcher	SL	М	Х	Х	Unlikely
Monarchidae	Symposiachrus trivirgatus trivirgatus	Spectacled Monarch	SL	М	Х	Х	Possible
Motacillidae	Motacilla flava	Yellow Wagtail	SL	М	-	Х	Unlikely
Oceanitidae	Fregetta grallaria grallaria	White-bellied Storm-petrel	LC	V	-	Х	Unlikely
Rhipiduridae	Rhipidura rufifrons	Rufous Fantail	SL	М	Х	Х	Possible
Scolopacidae	Actitis hypoleucos	Common Sandpiper	SL	М	-	Х	Unlikely
Scolopacidae	Calidris acuminata	Sharp-tailed Sandpiper	SL	М	-	Х	Unlikely
Scolopacidae	Calidris ferruginea	Curlew Sandpiper	CE	CE,M	-	Х	Unlikely
Scolopacidae	Calidris melanotos	Pectoral Sandpiper	SL	М	-	Х	Unlikely
Scolopacidae	Gallinago hardwickii	Latham's Snipe	SL	М	Х	Х	Unlikely
Scolopacidae	Numenius madagascariensis	Eastern Curlew	E	CE,M	-	Х	Unlikely
Scolopacidae	Tringa nebularia	Common Greenshank	SL	М	-	Х	Unlikely
Threskiornithidae	Plegadis falcinellus	Glossy Ibis	SL	М	Х	-	Unlikely
Turnicidae	Turnix olivii	Buff-breasted Button-quail	E	Е	-	Х	Unlikely
Tytonidae	Tyto novaehollandiae kimberli	Masked Owl (northern)	V	V	-	Х	Unlikely
Fishes							
Pristidae	Pristis pristis	Freshwater Sawfish	-	V,M	-	Х	Unlikely
Mammals							
Dasyuridae	Dasyurus hallucatus	Northern Quoll	LC	E	-	Х	Unlikely
Emballonuridae	Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheathtail Bat	E	V	-	Х	Probable <sup>4</sup>
Hipposideridae	Hipposideros semoni	Semon's Leaf-nosed Bat	E	V	-	Х	Unlikely
Megadermatidae	Macroderma gigas	Ghost Bat	E	V	-	Х	Unlikely
Phascolarctidae	Phascolarctos cinereus	Koala	V	V	Х	Х	Unlikely
Tachyglossidae	Tachyglossus aculeatus	Short-beaked Echidna	SL	-	-	-	Possible*
Reptiles							
Crocodylidae	Crocodylus porosus	Estuarine Crocodile	V	М	-	Х	Possible
Elapidae	Denisonia maculata	Ornamental Snake	V	V	-	Х	Unlikely
Scincidae	Egernia rugosa	Yakka Skink	V	V	-	Х	Unlikely
Scincidae	Lerista vittata	Mount Cooper Striped Skink	V	V	-	Х	Unlikely
Flora							
Apocynaceae	Marsdenia brevifolia	-	V	V	-	Х	Unlikely
Euphorbiaceae	Omphalea celata	-	V	V	-	Х	Unlikely
Fabaceae	Tephrosia leveillei (syn Tephrosia flagellaris)	-	LC	V	-	Х	Unlikely
Myrtaceae	Eucalyptus raveretiana	Black Ironbox	LC	V	Х	Х	Possible
Poaceae	Dichanthium setosum	Bluegrass	LC	V	-	Х	Unlikely
Solanaceae	Solanum sporadotrichum	-	NT	-	Х	-	Unlikely

<sup>1</sup> Status under Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 and Queensland *Nature Conservation Act* 1992. EX (Extinct), CE (Critically Endangered), V (Vulnerable), NT (Near Threatened), SL (Special Least Concern), Least Concern (LC) and M (Migratory).

<sup>2</sup> Database records included a Wildlife Online search (with a 30 km search area from a point central to the Project area), an EPBC Act Protected Matters Report (with a 20 km search area from a point central to the Project area), and the Atlas of Living Australia (a review of species records near the Project area).

<sup>3</sup> Likelihood of occurrence (LoC) categories comprise: 'Probable', 'Possible' and 'Unlikely'. Based on consideration of species records and distributions and the habitats in the Project area.

<sup>4</sup> This species was possibly recorded during the field survey, but it could not be confirmed.

x Denotes a species record was present.

- Not applicable/no data recorded.

\* This species was not recorded in database search results but has been added based on expert opinion.

Appendix J: Abundance of Weeds of Management Concern

### Weed species abundance<sup>B</sup> Sporobolus Sporobolus Ziziphus Xanthium Themeda Stachytarphet Jatropha Site Cryptostegia Parkinsonia natalensis/ jacquemontii Grewia **ID**<sup>A</sup> mauritiana occidentale quadrivalvis a jamaicensis gossypiifolia grandiflora aculeate pyramidalis (American asiatica (Jamaica (Bellyache (Chinee (Noogoora (Grader (Rubber Vine) (Parkinsonia) Rat's Tail (Giant Rat's (Grewia) Burr) Grass) Snakeweed) Bush) Apple) Tail Grass) Grass) **RE 2** 0 0 R \_ ---0 RE 3 0 --\_ ----F RE 5 F 0 -------RE 6 0 R --------RE 7 F ---------**RE 8** 0 R --------RE 9 0 R R R ----\_ -0 RE 10 R --\_ -----RE 11 R R R R ------0 RE 12 R -----RE 13 R 0 R -------RE 14 R Α --------RE 15 F R 0 -------RE 16 0 R ---\_ ---\_ RE 17 R R F -------RE 18 F -\_ ----\_ -RE 19 0 R -------RE 25 Α R R -------RE 26 0 R R А ------RE 38 Α R R -------RE 39 А 0 ---R ----RE 40 F F -\_ ----\_ \_ RE 42 F \_ \_ -\_ \_ -\_ \_ -0 RE 43 F R -------RE 44 F --------RE 46 F 0 --------RE 47 0 F --------RE 48 0 0 --------RE 49 0 --------

## Abundance of weeds of management concern at the vegetation assessment sites

-

-

-

\_

\_

\_

F <sup>A</sup> As per **Figure 6** and **Appendix H**.

0

А

-

0

RE 50

RE 51

RE 52

<sup>B</sup> Abundance: categories comprise Dominant (D) (>75% crown cover), Abundant (A) (50–75% crown cover), Frequent (F) (25–50% crown cover), Occasional (O) (5–25% crown cover) or Rare (R) (<5% crown cover).

-

R

-

-

-

-

R

<i>Lantana camara</i> (Lantana)	Vachellia farnesiana (Mimosa Bush)	Hymenachne amplexicaulis (Hymenachne)
-	-	-
R	-	-
-	-	-
-	R	-
-	-	-
-	R	-
-	R	-
-	-	-
-	-	-
-	-	-
R	-	-
-	-	-
-	-	-
-	-	-
-	-	А
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	R	-
-	-	-
-	_	-
-	_	-
-	_	-
-	_	-
-	_	-
-	_	-
-	-	-

Argyreia

nervosa

(Woodrose)

-

-

R

-

-

-

-

-

R

-

-

-

-

-

-

-

-

-

\_

R

-

R

F

F

0

-

-

R

0

-

\_

-

-

-

-

Appendix K: Potentially Relevant State and Commonwealth Legislation

Legislation	Type of approval	Potential triggers for approval	Comments
Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	EPBC Act referral	<ul> <li>A project requires Referral under the EPBC Act if it is likely to have a significant impact on a Matter of National Environmental Significance (MNES). For the Project area, the following MNES occur in the broader receiving environment:</li> <li>Listed threatened ecological communities</li> <li>listed threatened species</li> <li>listed migratory species</li> <li>wetlands of international importance.</li> </ul>	EPBC Act-listed threatened species, or their habitat, have the potential footprint is available, the significance of impacts as a result of the Proj documented in a self-assessment report. The self-assessment report sho approval.
Queensland	NT 4	λΥ 4	
Biosecurity Act 2014	NA	NA	<ul> <li>The field surveys identified the following weeds listed as Category 3 w</li> <li>Woodrose (Argyreia nervosa)</li> <li>Rubber Vine (Cryptostegia grandiflora)</li> <li>Hymenachne (Hymenachne amplexicaulis)</li> <li>Bellyache Bush (Jatropha gossypiifolia)</li> <li>Lantana (Lantana camara)</li> <li>Prickly Pear (Opuntia stricta)</li> <li>Parkinsonia (Parkinsonia aculeata)</li> <li>Sicklepod (Senna obtusifolia)</li> <li>American Rat's Tail Grass (Sporobolus jacquemontii)</li> <li>Giant Rat's Tail Grass (Sporobolus natalensis/pyramidalis)</li> <li>Chinee Apple (Zizinhus mauritania)</li> </ul>
			<ul> <li>Chinee Apple (<i>Elephus mauruana</i>)</li> <li>Category 3 weeds are invasive plants and must not be released into the weeds may be cleared. The abundance and location of weed species ha construction weeds may differ to what was observed during the field su undertaken immediately prior to construction to confirm the extents of undertaken on areas proposed to be disturbed during construction.</li> </ul>
Planning Act 2016 (Planning Act) Planning Regulation 2017	Development Application - General	Activities associated with the development of the Project are defined as 'Operational Works' under the Planning Act and will trigger approvals if accepted development requirements (ADRs) cannot be met. Activities potentially requiring approval are detailed below.	Some elements of development cannot meet exemptions or accepted de development application is required.
		Clearing native vegetation (Vegetation Management Act 1999 (VM Act)).	Vegetation clearing within the road reserve ( <i>ie</i> land dedicated as a road vegetation clearing approvals where the clearing occurs for Category R vegetation on freehold land is also exempt.
			Clearing for ancillary works ( <i>eg</i> access tracks, laydown area) in Catego This should be confirmed once the location/extent of ancillary works h
			For clearing that is not exempt and that does not meet ADR, a develop first stage requires that the clearing be determined a <i>relevant purpose</i> f Act. An application for <i>relevant purpose</i> determination was submitted clearing application, which cannot be applied for until the first stage is and meet the requirements of State Development Assessment Provision
		Constructing or raising waterway barrier works (Fisheries Act 1994).	The proposed alignment crosses several waterways that trigger conside During construction, waterway barriers will be installed on identified v ( <i>eg</i> bed level crossings, causeways, culvert crossings and some bridges temporary structures.
			Works associated with the Project may be considered temporary structuraising of temporary waterway barriers is within the period specified in <i>for operational work that is constructing or raising waterway barrier w</i> cannot meet the ADRs, they must be covered under a development approximation of the structure of
			Permanent works associated with construction of the pipeline and pum (and will not require development approval), if the following can be ac
			• the placement of the permanent infrastructure does not raise the natu
			• the placement of the permanent infrastructure does not reduce the cro
			• post construction, each waterway is reinstated to pre-existing conditi waterway bed with no changes in elevation, banks are re-profiled to riparian vegetation.

# Potentially relevant Commonwealth and State environmental legislation and approvals

l to occur in the Project area. Once a final clearing ject with respect to the EPBC Act should be assessed and ould inform decisions about the need for EPBC Act

veeds under the *Biosecurity Act* 2014 in the Project area:

e environment. During the construction of the pipeline<sup>1</sup>, as the potential to change annually; therefore, at the time of urveys. It is recommended that a detailed weed survey be weeds and to inform management. The survey needs to be

evelopment requirements (as detailed below); therefore, a

d under the Queensland *Land Act* 1994) is exempt from R or Category X vegetation. Clearing of Category X

ory B or Category R vegetation may comply with ADRs. as been identified.

oment approval is needed. This is a two-stage process. The for infrastructure activities under section 22A of the VM by GHD on 3 December 2020. The second stage is the s completed. The development application must address ons *State Code 16: Native vegetation clearing*.

eration of waterway barrier works.

waterways. Waterway barriers include vehicle crossings s), partial bunds, silt curtains, abutment works and

ures, and comply with the ADRs if the construction or a Section 7 of DAF's 'Accepted development requirements works'. If any proposed temporary waterway barrier works proval.

p station will not be considered waterway barrier works chieved:

aral bed level of each waterway

oss-sectional area of each waterway

ions, using natural substrate of similar composition on the pre-existing conditions and stabilised with suitable

Legislation	Type of approval	Potential triggers for approval	Comments
			Further information regarding pipeline installation and final design pla constitute waterway barrier works.
		Undertaking high impact earthworks within a Wetland Protection Area (Planning Act)	No construction activities will be taking place within a Wetland Protect undertaking high impact earthworks within a Wetland Protection Area
<i>Nature Conservation</i> <i>Act</i> 1992 (NC Act) and subordinate legislation	Species Management Program (SMP) (low risk and high risk)	An SMP is required for activities that tamper with breeding places of all native species.	Hollow-bearing trees occur in mature Eucalypt and large Melaleuca sp may provide a breeding or roosting place for a variety of fauna, include
			• Bare-rumped Sheathtail Bat (Saccolaimus saccolaimus nudicluniatu
			• Black-throated Finch (Poephila cincta cincta).
			A low risk SMP may be completed for Least Concern species; however, Concern and colonial breeding species.
Environmental Offsets Act 2014	Environmental offset	<ul> <li>Environmental offsets are applicable if the project has a <i>significant residual impact</i> (SRI) on a <i>prescribed environmental matter (eg</i> Matters of National Environmental Significance, Matters of Local Environmental Significance and Matters of State Environmental Significance). Potentially applicable <i>prescribed environmental matters</i> for the Project include:</li> <li>clearing of regulated vegetation that is remnant vegetation within the defined distance of a watercourse identified on the vegetation management watercourses map and essential habitat as identified on the essential habitat map</li> <li>impacting on connectivity of remnant vegetation and Regional Ecosystems through clearing activities</li> <li>impacts on habitat for Endangered, Vulnerable or Special Least Concern species (NC Act)</li> </ul>	Environmental offsets may be required as a condition of approval whe Final clearing footprints are required to assess if development will hav
Water Act 2000 (Water Act)	Riverine Protection Permit (RPP)	• limiting the passage of fish within a waterway. Excavate and replace material within a watercourse (as defined by the Water Act).	Local government is considered an Approved Entity and is exempt fro conditions outlined in the <i>'Riverine Protection Permit Exemption Requ</i> adhered to. Should the minimum requirements not be achieved, an RP
	Water entitlement (water licence)	Temporarily 'taking' (impounding or diverting) water whilst trenching within watercourses.	<ul> <li>Local government is considered a Constructing Authority and is exem 'Taking' water includes extracting water for construction purposes (free diverting water to conduct trenching activities.</li> <li>For this exemption to apply, conditions outlined in the '<i>Exemption req</i> <i>water without a water entitlement (OSW/2020/5467)</i>' (DRDMW 2021) requirements not be achievable, a water licence will be required.</li> <li>If there is a shortage of water available, the Queensland Department of (DRDMW) may impose, by notice, conditions or restrictions relating to the provide the provide the provided to th</li></ul>
<i>Environmental</i> <i>Protection Act</i> 1994 (EP Act) and subordinate legislation	Notification	General Environmental Duty (due diligence) Duty to Notify Environmentally Relevant Activity (ERA)	The EP Act outlines that a person must not carry out any activity that of person takes all reasonable and practicable measures to prevent or min Further, individuals have a 'Duty to Notify' their employers if they be creating environmental harm by their or someone else's activities.
Environmental			implemented.
Protection Regulation 2019 (EP Regulation)			Carrying out an ERA will require an environmental authority (EA) un release contaminants with the potential to cause environmental harm. Y an ERA, ancillary activities associated with the construction may be an
	Environmental authority (site-specific) for	If the minimum thresholds (identified in Schedule 2 of the EP Regulation) are exceeded, an EA is required.	As per the pre-lodgement advice (Queensland Government 2021), this material removed at any point in time.
	undertaking prescribed ERA 16 – Extractive and Screening Activities	-	Extraction of material for construction purposes will be an ERA if three

<sup>1</sup> The Project = Haughton Pipeline Stage 2 Project.

<sup>2</sup> T&NT = Threatened (Critically Endangered, Endangered, Vulnerable) and Near Threatened species.

## **References:**

DNRME 2019, Riverine protection permit exemption requirements, WSS/2013/726 Version 2.01, Queensland Department of Natural Resources, Mines and Energy, 13 November 2019.

DRDMW, 2021, OSW/2020/5467 Exemption requirements for constructing authorities for the take of water without a water entitlement, Version 4.01, Queensland Department of Regional Development, Manufacturing and Water, Brisbane. Queensland Government 2021, 2012-20139 SPL: 12537606 - Haughton Pipeline Duplication Stage 2: Pre-lodgement meeting record, Queensland Government State Assessment and Referral Agency, 7 January 2021.

ans are required to determine whether the proposed works

ection Area trigger area; therefore, an application for is not required.

pecies in the Project area. Tree hollows vary in size and ding listed T&NT species such as: us)

er, a high risk SMP is required for T&NT, Special Least

ere proposed activities are likely to result in an SRI. ve an SRI on prescribed environmental matters.

om requiring an RPP. For this exemption to apply, uirements (WSS/2013/726)' (DNRME 2019) must be P will be applicable.

npt from requiring a water licence for the 'taking' of water. rom surface water or sub-artesian groundwater) and

quirements for constructing authorities for the take of 1) must be complied with. Should the exemption

f Regional Development, Manufacturing and Water to the 'take' of water, including limitations on the times of water to be taken.

causes, or is likely to cause, environmental harm unless the nimise the harm (the General Environmental Duty). ecome aware of environmental harm or if there is a threat of

gement Plan (Construction) should be prepared and

der the EP Act. An ERA is an activity that will or may Whilst the construction and operation of the pipeline is not an ERA.

ERA may be triggered depending on the quantities of

esholds are exceeded.



**Environmental Approval & Compliance Solutions** 

Cairns Office: Level 1, 320 Sheridan Street, PO Box 5678 Cairns QLD 4870 P: 61 7 4034 5300

Townsville Office: Suite 2A, Level 1, 41 Denham Street, PO Box 539 Townsville QLD 4810

P: 61 7 4796 9444

## www.natres.com.au • nra@natres.com.au

Natural Resource Assessments Pty Ltd trading as NRA Environmental Consultants. ABN: 77 011 073 135 Certified Integrated Management System: ISO 9001:2015 (Quality), ISO 14001:2015 (Environment), ISO 45001:2018 (Safety).