

Attachment 7

Offset Management Strategy



WINCHESTER SOUTH PROJECT

Environmental Impact Statement

Additional Information



WHITEHAVEN COAL



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EXECUTIVE SUMMARY

This document describes the strategy proposed by Whitehaven WS Pty Ltd (Whitehaven WS) to offset the significant residual impacts from the Winchester South Project (the Project) on Matters of National Environmental Significance and Matters of State Environmental Significance in accordance with the Project Terms of Reference for the Environmental Impact Statement.

Biodiversity offsets would be established for the Project in stages over the life of the Project, and three indicative stages have been nominated. The clearance associated with Stage 1 footprint has been quantified and this will represent the clearance limit for Stage 1. The actual location of Stage 1 clearance may vary but will not exceed the clearance limit. Subsequent stages are indicative and may change depending on the progression of the mine.

This document provides the details of three land-based offset areas for impacts associated with the first stage of the Project on Matters of National Environmental Significance and Matters of State Environmental Significance. The three land-based offset areas cover a total of 2,725 hectares and are named the Wynette Offset Area, Ellensfield Offset Area, and Inderi Offset Area. Field surveys have been undertaken on the offset areas and have assessed the suitability of the offset against the requirements of the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy 2012* and *Queensland Environmental Offsets Policy (Version 1.11)*.

The three offset areas would sufficiently offset the impacts from the first stage of the Project on relevant Matters of National Environmental Significance, namely the *Poplar Box Grassy Woodland on Alluvial Plains* threatened ecological community, *Natural Grasslands of the Queensland Central Highlands and the Northern Fitzroy Basin* threatened ecological community and habitat for the Ornamental Snake (*Denisonia maculata*), Squatter Pigeon (southern subspecies) (*Geophaps scripta*), Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) and Greater Glider (*Petauroides volans*) and partly offset impacts from a second stage of the Project. The future quality of the Matters of National Environmental Significance habitat in the offset areas would be increased over time through the implementation of management measures.

The three offset areas would sufficiently offset the impacts from the first stage of the Project on relevant Matters of State Environmental Significance, namely Regulated Vegetation and Connectivity (and the threatened species listed above), and partly offset impacts from a second stage of the Project. A Notice of Election would be prepared and submitted to the Department of Environment and Science prior to the commencement of each stage. The notification would identify the intended offset delivery approach, and whether the offset is to be delivered as a:

- proponent-driven offset (i.e. a traditional land-based offset);
- financial settlement offset; or
- combination of proponent-driven offset and financial settlement offset.

Whitehaven WS would enter into an agreed delivery arrangement with the Department of Environment and Science to offset impacts on Matters of State Environmental Significance.

There are a number of mechanisms by which Whitehaven WS can legally secure and manage offset areas for the Project. The currently preferred mechanism is to establish a legally binding agreement with the current registered landholders. This could be achieved by establishing an Offset Agreement with the current registered landholders to enter a Voluntary Declaration under the *Vegetation Management Act 1999*.

A7 OFFSET MANAGEMENT STRATEGY

A7.1 INTRODUCTION

This document describes the strategy proposed by Whitehaven WS Pty Ltd (Whitehaven WS) to offset the significant residual impacts from the Winchester South Project (the Project) on Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES) in accordance with the Project Terms of Reference for the Environmental Impact Statement (EIS), which was issued in September 2019.

A7.1.1 Background

Whitehaven WS proposes to develop the Project, within the Bowen Basin, located approximately 30 kilometres south-east of Moranbah, within the Isaac Regional Council Local Government Area (Figures A7-1 and A7-2). The Project involves the development of an open cut coal mine in an existing mining precinct for export of coal products. The Project would include construction and operation of a mine infrastructure area (MIA), including a coal handling and preparation plant (CHPP), train load-out facility and rail spur, which would be used for the handling, processing and transport of coal. An infrastructure corridor would also form part of the Project, including a raw water supply pipeline connecting to the Eungella pipeline network, an electricity transmission line (ETL) and a mine access road.

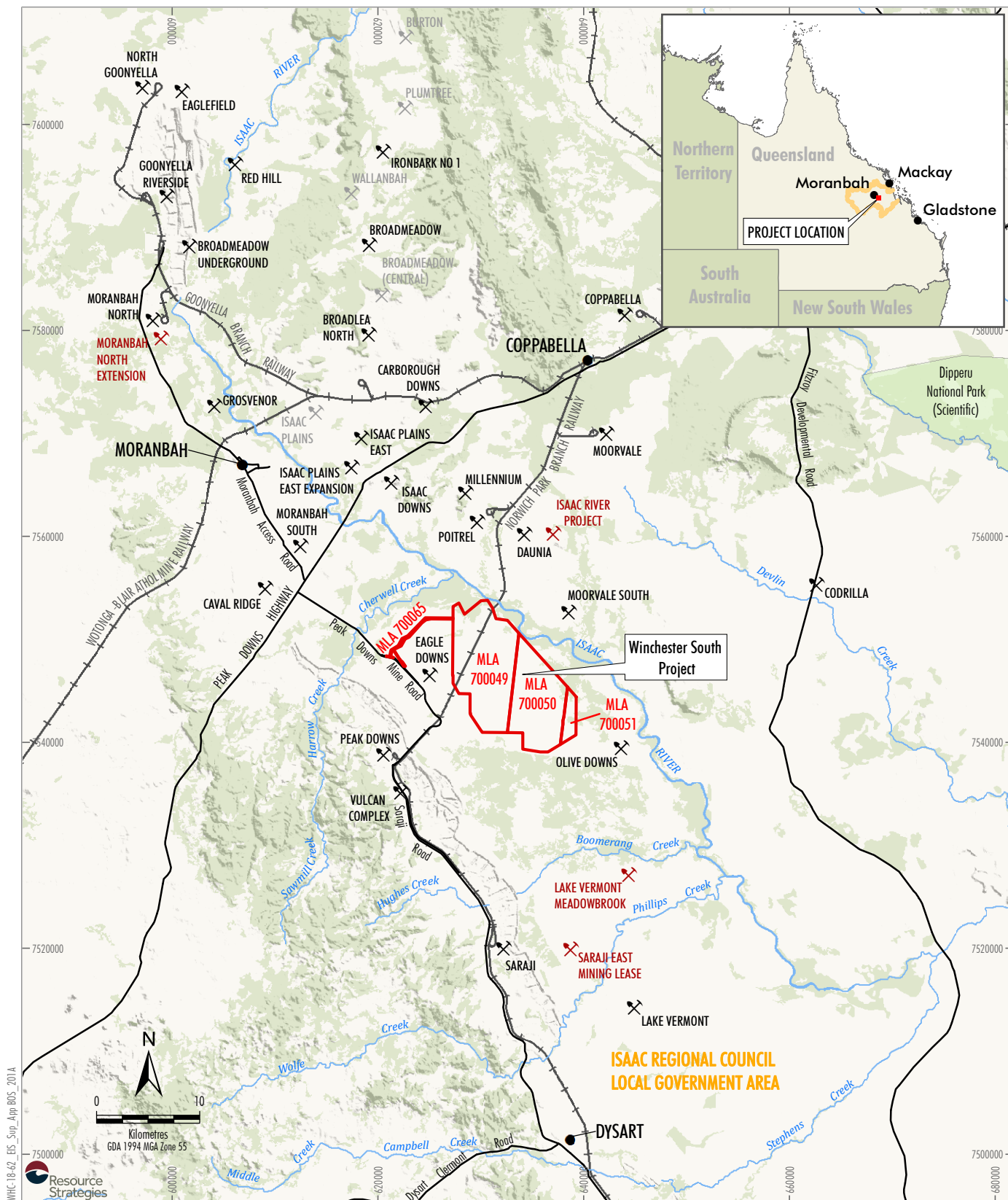
The Coordinator-General declared the Project to be a ‘coordinated project’ for which an EIS is required under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971*.

Three referrals have been made under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) regarding the three different components of the Project. The following controlling provisions apply for each action under the EPBC Act:

- Winchester South Mine Site and Access Road (EPBC 2019/8460):
 - listed threatened species and communities (sections 18 and 18A); and
 - a water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E).
- Winchester South Water Pipeline (EPBC 2019/8459):
 - listed threatened species and communities (sections 18 and 18A).
- Winchester South Project ETL (EPBC 2019/8458):
 - listed threatened species and communities (sections 18 and 18A).

This document has been developed to describe the strategy to address the potential residual significant impacts on biodiversity values associated with the Project in accordance with the following Acts and policies:

- the EPBC Act;
- the *Environmental Offsets Act 2014*;
- the *Queensland Environmental Offsets Policy (Version 1.11)* (Department of Environment and Science [DES], 2021); and
- the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC], 2012a) (and supporting *Offsets Assessment Guide* [DSEWPaC, 2012b]).



- LEGEND**
- Mining Lease Application Boundary
 - ✂ Approved/Operating
 - ✂ Proposed
 - ✂ Care and Maintenance
 - Local Government Area Boundary
 - + + Railway
 - Road

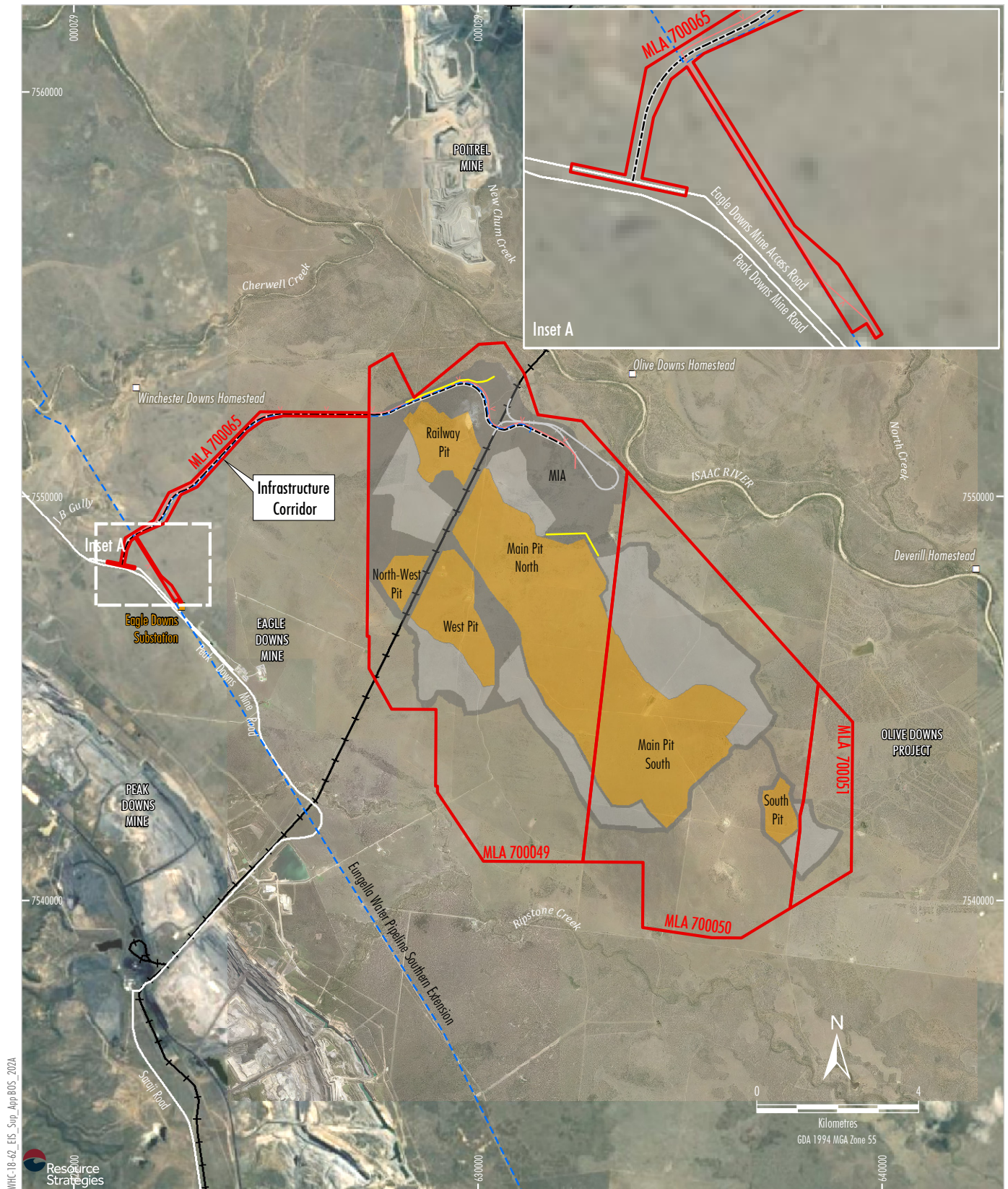
Source: The State of Queensland (2018 - 2020);
Geoscience Australia (2018)

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WINCHESTER SOUTH PROJECT

Project Location

Figure A7-1



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- LEGEND**
- Mining Lease Application Boundary
 - Engella Water Pipeline Southern Extension
 - + + + Railway
 - Substation
 - Project Component*
 - Indicative Infrastructure Area
 - Indicative Out-of-pit Waste Rock Emplacement
 - Indicative Open Cut Pit Including In-pit Waste Rock Emplacement
 - Indicative Mine Access Road
 - Indicative Rail Spur and Loop
 - Indicative Electricity Transmission Line
 - Indicative Raw Water Supply Pipeline
 - Indicative Flood Levee

*Note: * Excludes some project components such as water management infrastructure, access tracks, topsoil stockpiles, explosives magazines, power reticulation, temporary offices, other ancillary works and construction disturbance.*

Source: The State of Queensland (2018 - 2020); Whitehaven (2022)
Orthophoto: Google Image (2019); Whitehaven (2017)

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WINCHESTER SOUTH PROJECT
Project General Arrangement

Figure A7-2

A7.1.2 Commonwealth Offset Requirements

Table A7-1 provides a reconciliation of sections of this document which satisfy the components of the Terms of Reference relevant to MNES. The offset management plan requirements are discussed in Section A7.3.5.

Table A7-1
Terms of Reference for the Project Relevant to Matters of National Environmental Significance

Terms of Reference	Requirement	Section Addressed
Matters of National Environmental Significance – Offsets		
11.183	<i>For each of the proposed actions the MNES chapter must include an assessment of the likelihood of residual significant impacts occurring on listed threatened species and communities after avoidance, mitigation and management measures relating to the projects have been applied. If it is determined that a residual significant impact is likely, include a draft Offset Management Strategy (as an appendix to the EIS) that provides, at a minimum:</i>	This Attachment
	<i>(a) details of the environmental offset/s (in hectares) for residual significant impacts of the proposed action on relevant MNES, and/or their habitat;</i>	Section A7.1.2
	<i>(b) details of how the environmental offset/s meets the requirements of the Department's EPBC Act 1999 Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide, available at: www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy;</i>	Section A7.3.4
	<i>(c) details of a strategy for the staging of environmental offset/s for each project stage (if proposed);</i>	Section A7.2
	<i>(d) details of appropriate offset area/s (including a map) to compensate for the residual significant impact on relevant MNES, and/or their habitat;</i>	Section A7.3
	<i>(e) information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors; and</i>	Section A7.4.4
	<i>(f) details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation.</i>	Section A7.3.6

E2M Pty Ltd (E2M) (2021) considered impact avoidance and mitigation measures and identified that the Project would result in significant residual impacts on the following MNES listed under the EPBC Act:

- *Poplar Box Grassy Woodland on Alluvial Plains* threatened ecological community (Poplar Box TEC);
- *Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin* threatened ecological community (Natural Grasslands TEC);
- Ornamental Snake (*Denisonia maculata*);
- Squatter Pigeon (southern subspecies) (*Geophaps scripta scripta*);
- Koala (combined populations of Queensland, New South Wales [NSW] and the Australian Capital Territory [ACT]) (*Phascolarctos cinereus*); and
- Greater Glider (*Petauroides volans*).

The Project's residual impacts where related to MNES are provided in Table A7-2. Whitehaven WS proposes a proponent-driven land-based offset strategy with offset staging (Figure A7-3) to offset the Project impacts. The extent of MNES and the relevant habitat in the Project area are provided in Section 5 of the Draft EIS and shown on Figures A7-4 to Figure A7-10.

As described in Attachment 4 (Response to DAWE Advice) of the Project Additional Information all disturbance associated with the Project has been allocated to the main Action associated with the Project, i.e. Mine Site and Access Road (EPBC 2019/8460). This is reflected in Table A7-2 below.

Table A7-2
Summary of Impacts to Matters of National Environmental Significance for the Project

Matter of National Environmental Significance	Total (ha)			Overall Total (ha)
	Stage 1 ¹	Stage 2	Stage 3	
Natural Grasslands TEC	80.9	0	0	80.9
Poplar Box TEC	0	9.6	0	9.6
Ornamental Snake (<i>Denisonia maculata</i>)	50	1,523.1	261.1	1,834.2
Squatter Pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	53.8	61.7	0	115.5
Koala (combined populations of Queensland, NSW and the ACT) (<i>Phascolarctos cinereus</i>)	78.2	90.7	0	168.9
Greater Glider (<i>Petauroides volans</i>)	42.1	90.7	0	132.8

ha = hectares.

¹ Disturbance associated with the Electricity Transmission Line (EPBC 2019/8458) and Water Pipeline (EPBC 2019/8459) within MLA 700049, MLA 700050, MLA 700051 and MLA 700065 is assessed under the Mine Site and Access Road (EPBC 2019/8460).

A7.1.3 State Offset Requirements

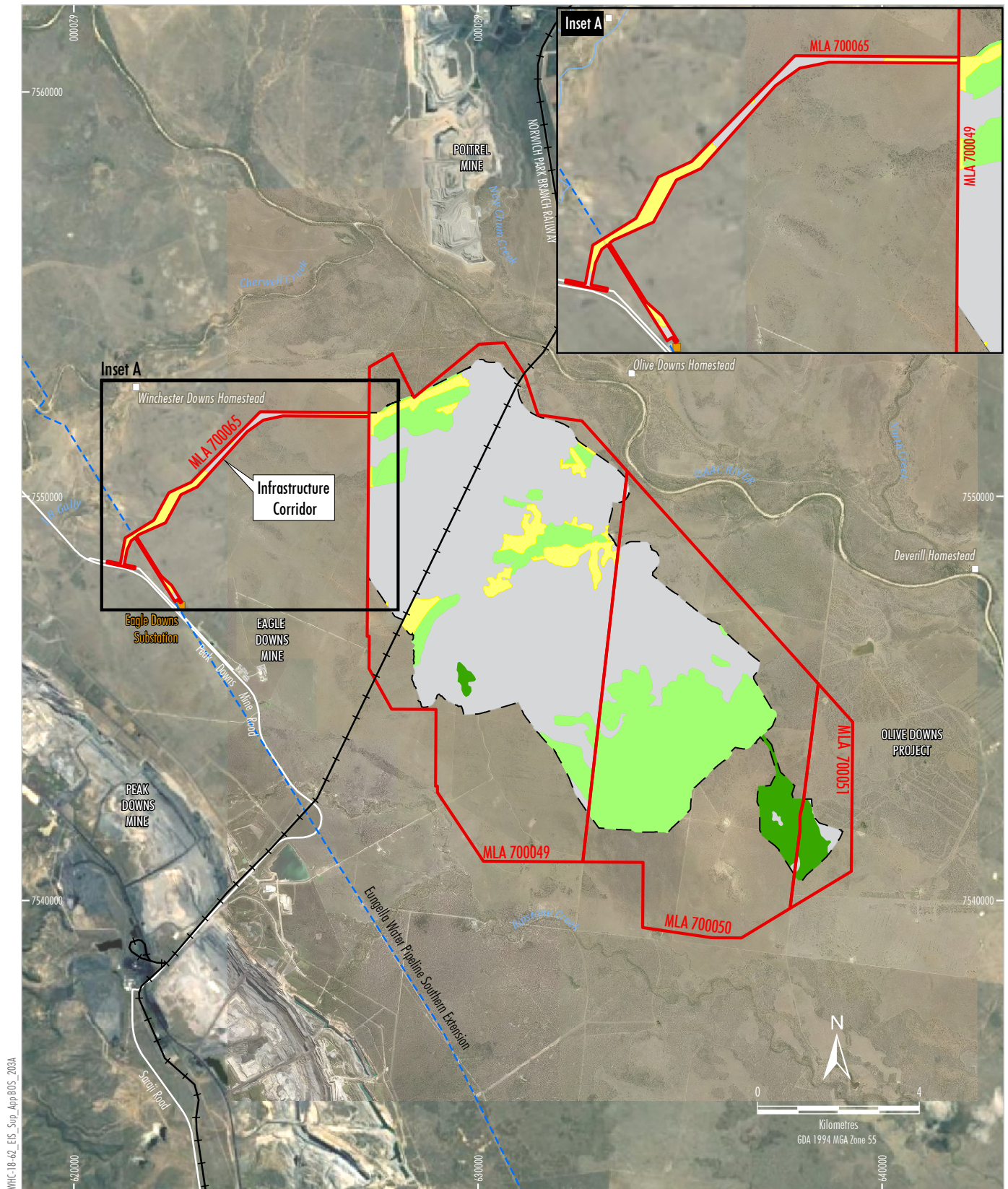
Table A7-3 provides a reconciliation of sections of this document which satisfy the components of the Terms of Reference relevant to MSES.

Table A7-3
Terms of Reference for the Project Relevant to Matters of State Environmental Significance

Terms of Reference	Requirement	Section Addressed
11.27	<i>The EIS should identify whether the Project would result in a significant residual impact on MSES with reference to the Queensland Environmental Offsets Policy, Significant Residual Impact Guideline 2014. The EIS should reference relevant parts of the Guide to determining terrestrial habitat quality (see Appendix 1) and must demonstrate that offsetting is the preferred option after all avoidance and mitigation measures have been considered, in accordance with the Environmental Offsets Act 2014.</i>	Sections A7.1.3 and A7.4
11.28	<i>Identify and illustrate the extent of any overlap between MNES and MSES.</i>	Section A7.1.3
11.29	<i>For any significant residual impact, propose offsets that are consistent with the following requirements as set out in applicable State and Commonwealth legislation or policies:</i> <i>(a) where a significant residual impact will occur on a prescribed environmental matter as outlined in the Environmental Offsets Regulation 2014, the offset proposal(s) must be consistent with the requirements of Queensland's Environmental Offsets Act 2014 and the latest version of the Queensland Environmental Offsets Policy (Version 1.6) 2018 (see Appendix 1)</i> <i>(b) where Commonwealth offset policy requires an offset for significant residual impacts on a MNES, the offset proposal(s) must be consistent with the requirements of the EPBC Act Environmental Offsets Policy (October 2012), the Offsets assessment guide and relevant guidelines.</i>	Sections A7.1.3 and A7.4
11.30	<i>For staged offsets, the full extent of potential impacts on prescribed environmental matters from the entire proposal needs to be taken into account as part of the significant residual impact test.</i>	Sections A7.1.3 and A7.2

The Project has potential to result in significant residual impacts on a number of MSES, after consideration of the *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021), and *Significant Residual Impact Guideline* (DES, 2014). Offsetting is the preferred option of addressing significant residual impacts.

The significant residual impacts on MSES are provided in Table A7-4. The extent of MSES and/or the relevant habitat in the Project area are provided in Section 4 of the Main Text of the EIS.



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- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Railway
 - Eungella Water Pipeline Southern Extension
 - Substation
 - Land without MNES or MSES
 - Disturbance Associated with Offset Stages*
 - Stage 1
 - Stage 2
 - Stage 3

Note:

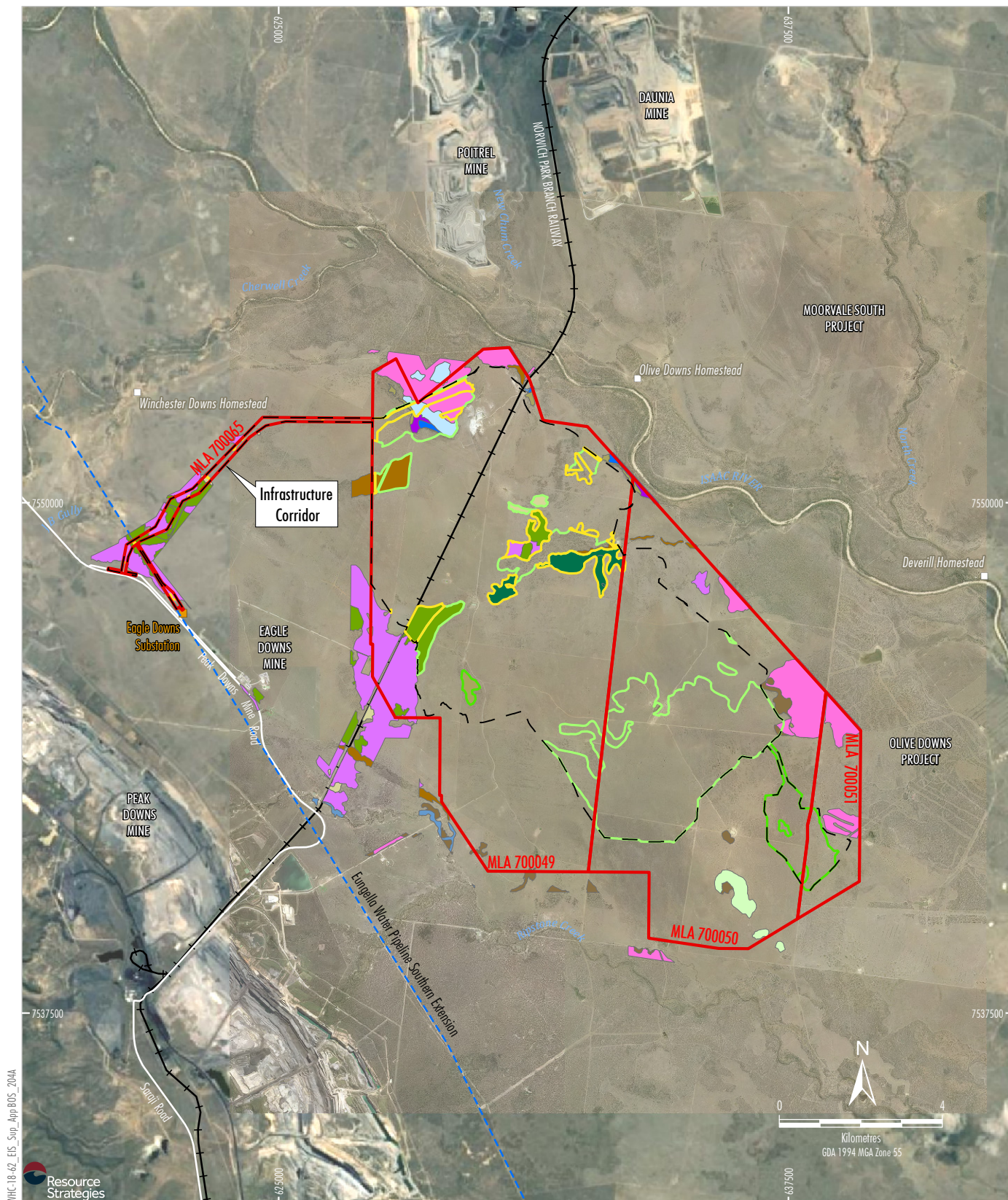
* Indicative layout shown based on current mine planning and is subject to change based on detailed mine planning with offsets provided prior to on-ground impacts.

- The entirety of the Electricity Transmission Line (EPBC 2019/8458), Water Pipeline (EPBC 2019/8459), and the Access Road component of the Mine Site and Access Road (EPBC 2019/8460) is contained within the Disturbance Associated with Offset Stage 1.

Source: The State of Queensland (2018 - 2020); Whitehaven (2020)
Orthophoto: Google Image (2019); Whitehaven (2017)

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Biodiversity Offset Staging

Figure A7-3



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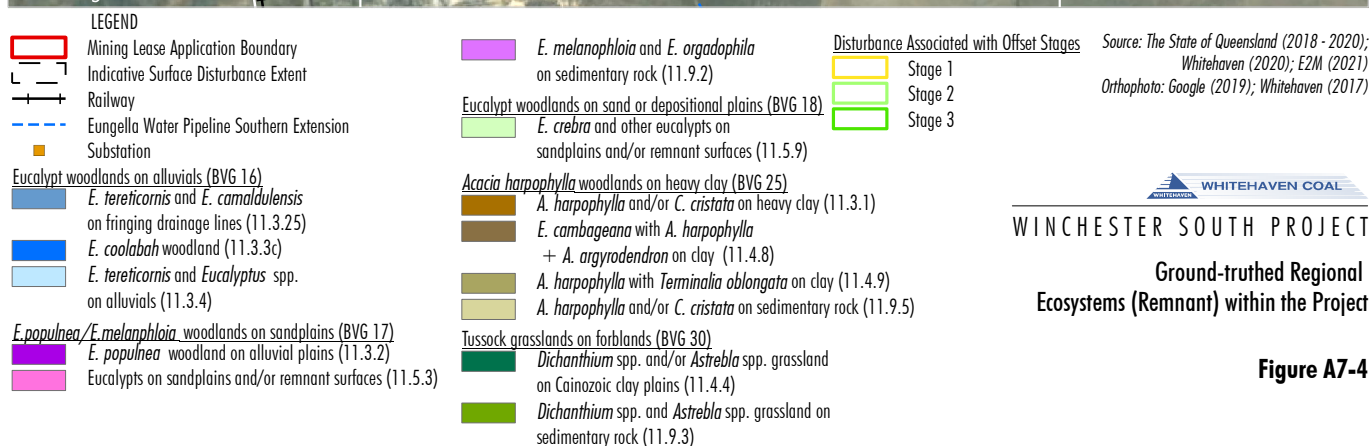
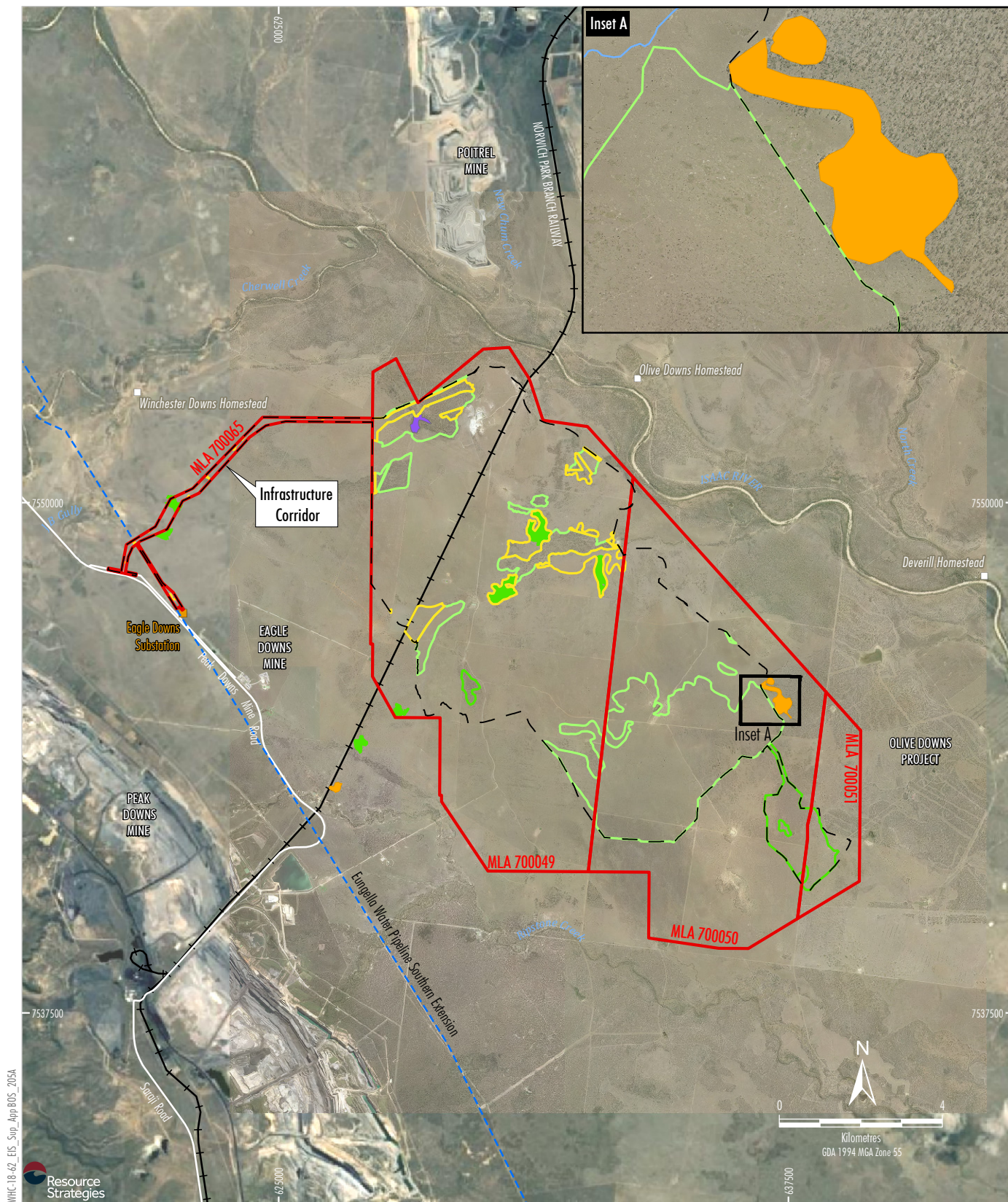


Figure A7-4



WHC-18-62_EIS_Sup_App_BOS_205A

- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Railway
 - Eungella Water Pipeline Southern Extension
 - Substation

- Threatened Ecological Community**
- Poplar Box Grassy Woodland on Alluvial Plains
 - Natural Grasslands of the Queensland
 - Central Highlands and Northern Fitzroy Basin
 - Brigalow (*Acacia harpophylla* Dominant and Co-dominant)
- Disturbance Associated with Offset Stages**
- Stage 1
 - Stage 2
 - Stage 3

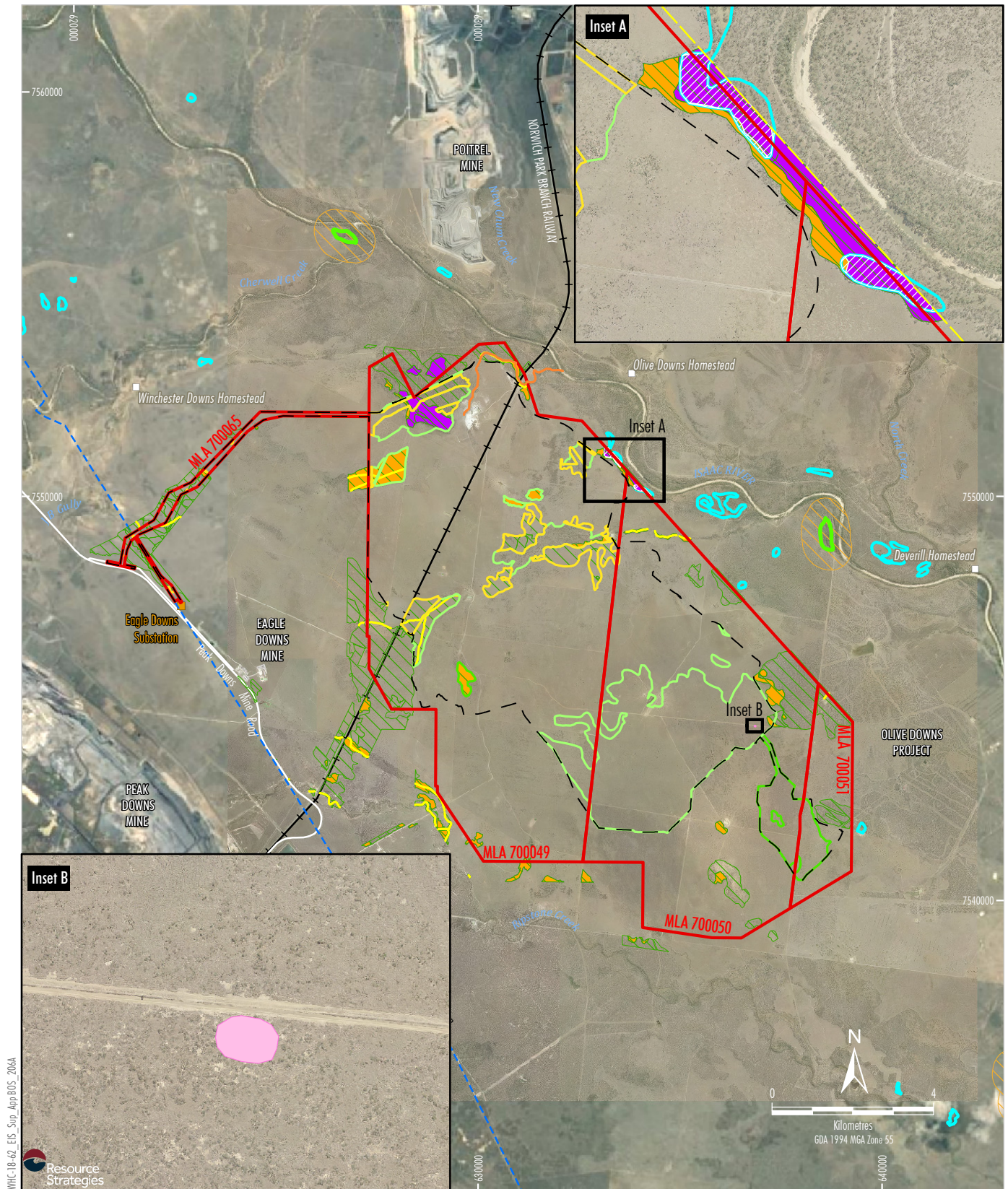
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

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WINCHESTER SOUTH PROJECT

**Threatened Ecological Communities
within the Project**

Figure A7-5



WHC-18-62 EIS Sup App BOC 206A

- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Railway
 - Substation
 - Matters of State Environmental Significance**
 - Regulated Vegetation**
 - Endangered Regional Ecosystem (11.3.1, 11.4.8, 11.4.9 and 11.9.5)
 - Of Concern Regional Ecosystem (11.3.2, 11.3.3c and 11.3.4)
 - Regional Ecosystem that Intersects a Mapped Vegetation Management Wetland
 - Regional Ecosystem within the Defined Distance of a Vegetation Management Watercourse

Wetlands and Watercourses

- High Ecological Significance Wetland (DES, 2020)
- Vegetation Management Wetland Mapping (DES, 2020)
- Wetland Protection Area (DES, 2020)

Connectivity

- Remnant Vegetation

Protected Wildlife Habitat*

- Solanum adenophorum* Habitat
- Ground-truthed Waterways Providing for Fish Passage ^

*Note: The Protected Wildlife Habitat for species that are also Matters of National Environmental Significance (i.e. the Ornamental Snake, Squatter Pigeon, Koala and Greater Glider) are assessed and presented in Section 5, including Essential Habitat (Protected Wildlife Habitat for the Ornamental Snake).

^ As stated in the Environmental Offsets Regulation 2014, any part of a waterway providing for passage of fish is a Matter of State Environmental Significance (MSES) only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.

Disturbance Associated with Offset Stages

- Stage 1
- Stage 2
- Stage 3

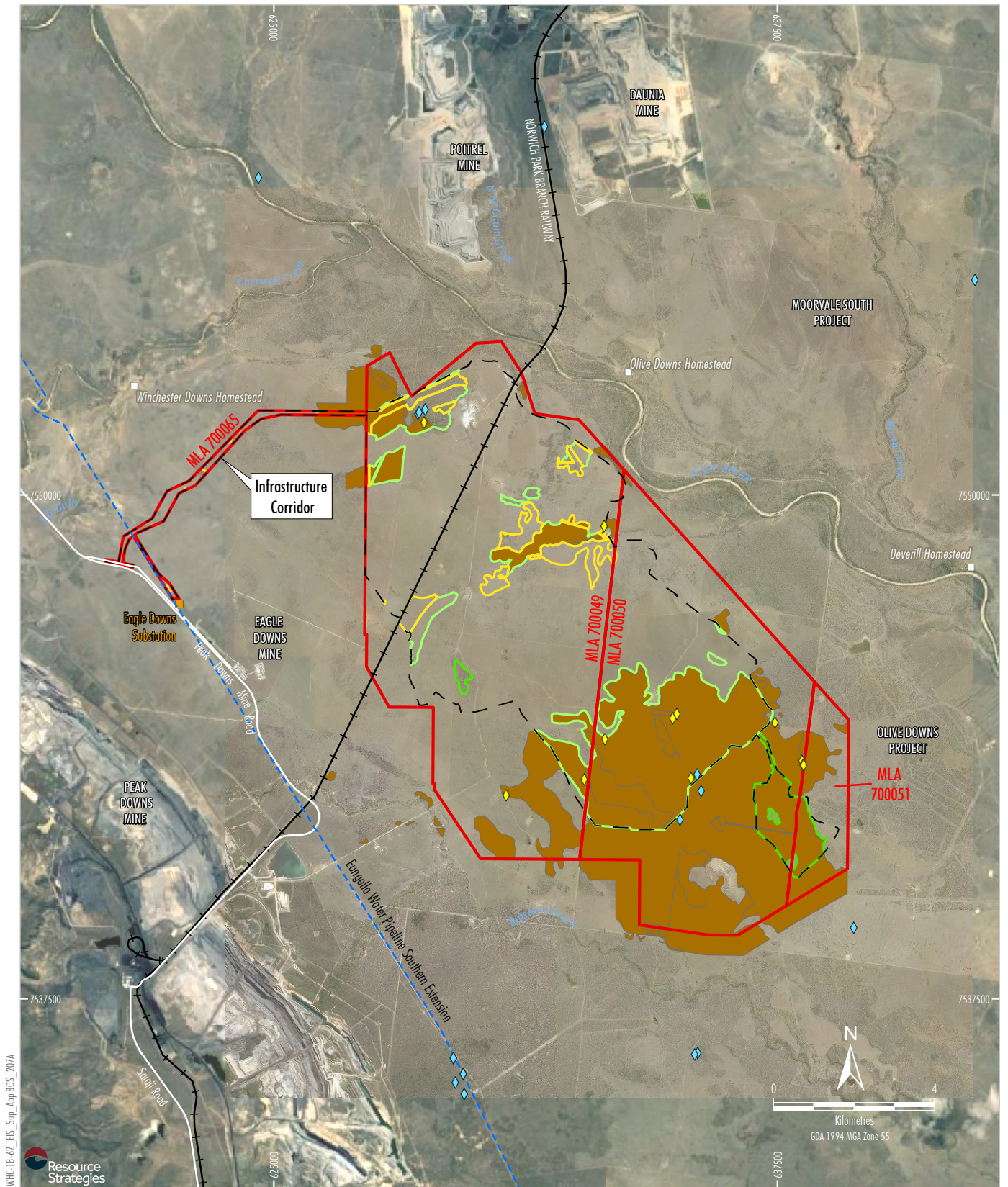
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

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Matters of State Environmental Significance within the Project

Figure A7-6



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- | | |
|--|---|
| LEGEND | Potential Habitat |
| Mining Lease Application Boundary | Ornamental Snake Important Habitat |
| Indicative Surface Disturbance Extent | Disturbance Associated with Offset Stages |
| Eungella Water Pipeline Southern Extension | Stage 1 |
| Railway | Stage 2 |
| Substation | Stage 3 |
| E2M (2021) Surveys | |
| ◆ Ornamental Snake | |
| Previous Surveys | |
| ◆ Ornamental Snake | |

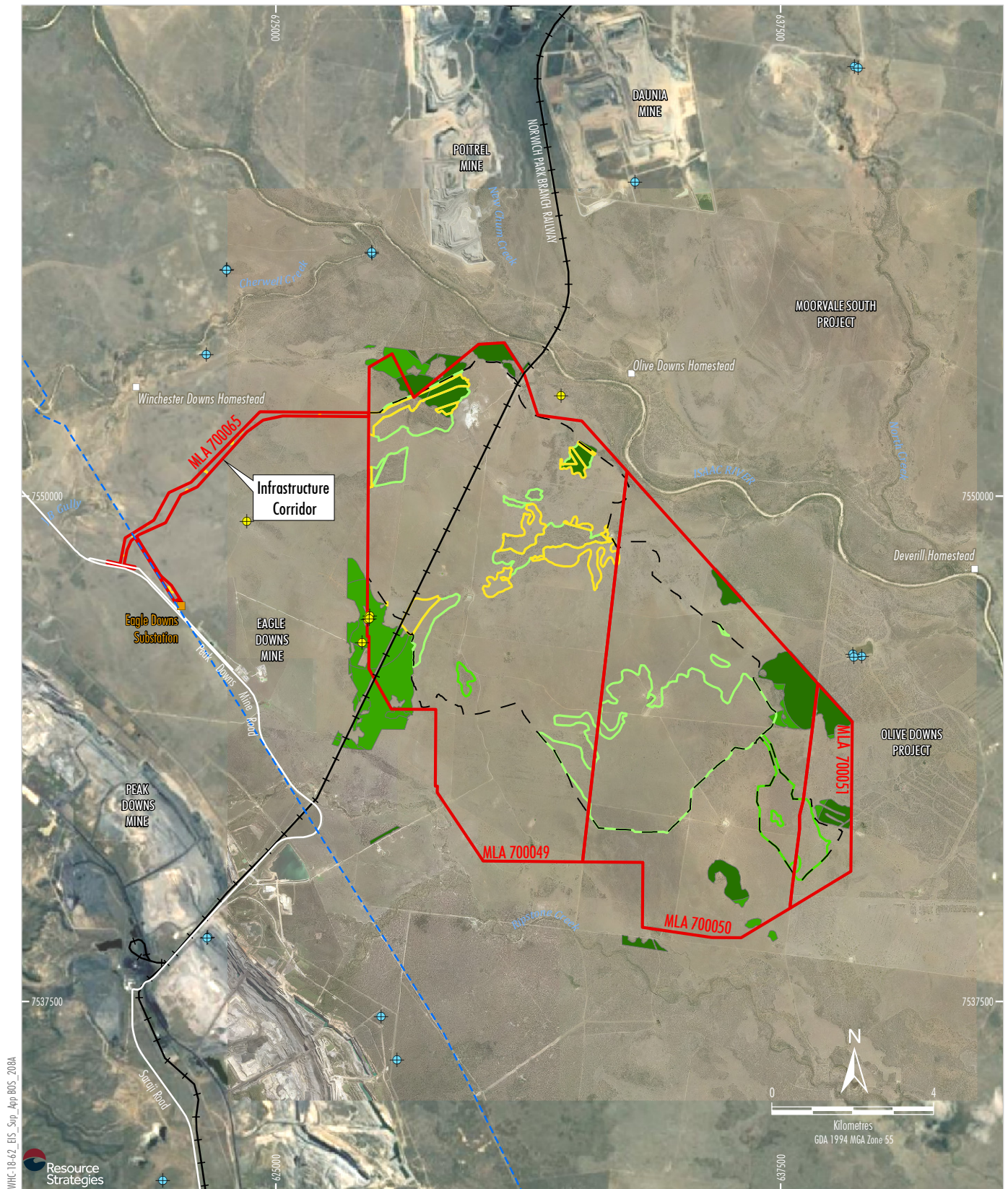
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

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**Ornamental Snake Habitat
within the Project**

Figure A7-7



WHC-18-62_EIS_Sup_Appl_BCS_208A

- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Eungella Water Pipeline Southern Extension
 - Railway
 - Substation
 - E2M (2021) Surveys**
 - Squatter Pigeon (southern subspecies)
 - Previous Surveys**
 - Squatter Pigeon (southern subspecies)
- Potential Habitat**
- Squatter Pigeon Breeding and Foraging Habitat
 - Squatter Pigeon Foraging Habitat
- Disturbance Associated with Offset Stages**
- Stage 1
 - Stage 2
 - Stage 3

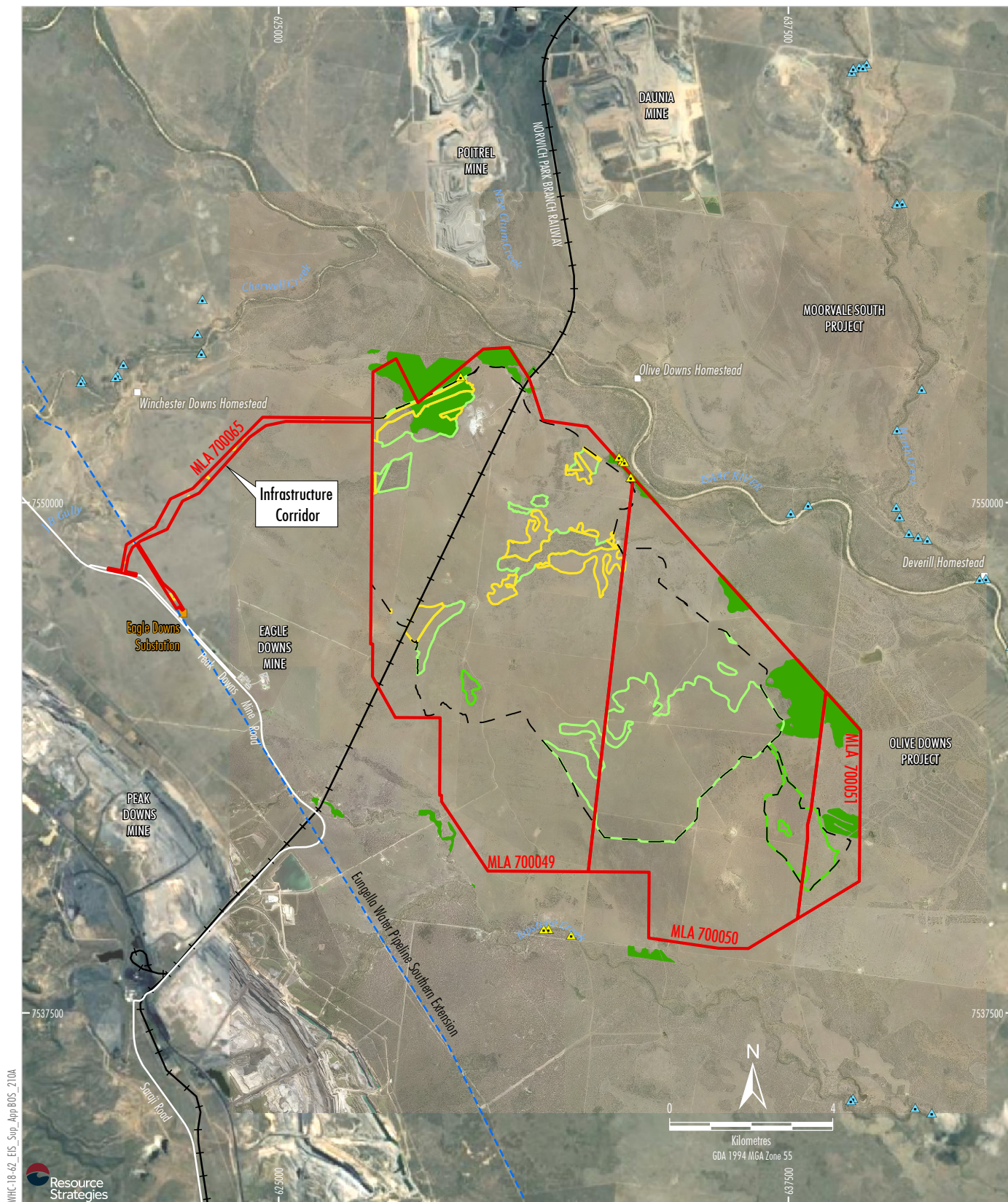
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

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WINCHESTER SOUTH PROJECT
Squatter Pigeon (southern subspecies)
Habitat within the Project

Figure A7-8



-  WHITEHAVEN COAL
- WINCHESTER SOUTH PROJECT
- Koala (combined populations of
Queensland, NSW and the ACT) Habitat
within the Project
- Figure A7-9**



WHC-18-62 EIS_Sup_App B05_210A



- | | |
|---|---|
| LEGEND | Potential Habitat |
| Mining Lease Application Boundary | Greater Glider Habitat (Potential Breeding and Foraging) |
| Indicative Surface Disturbance Extent | Disturbance Associated with Offset Stages |
| Engella Water Pipeline Southern Extension | Stage 1 |
| Railway | Stage 2 |
| Substation | Stage 3 |
| E2M (2021) Surveys | |
| ▲ Greater Glider | |
| Previous Surveys | |
| ▲ Greater Glider | |

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

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WINCHESTER SOUTH PROJECT
Greater Glider Habitat within the Project

Figure A7-10

Table A7-4
Summary of Impacts to Matters of State Environmental Significance for the Project

Matter of State Environmental Significance	Broad Vegetation Group (BVG)	Stage 1 (ha)	Stage 2 (ha)	Stage 3 (ha)	Total (ha)
Regulated Vegetation - Endangered Regional Ecosystem					
RE 11.3.1	25a	5	59.5	0	64.5
RE 11.4.8		0	2.4	0	2.4
RE 11.4.9		1.1	2.6	19.4	23.1
RE 11.9.5		2.4	15.3	0	17.7
Regulated Vegetation - Of Concern Regional Ecosystem					
RE 11.3.2	This MSES is equivalent to the Poplar Box TEC, and the offset requirement is provided in Table A7-2.				
RE 11.3.3c	16c	0	6.9	0	6.9
RE 11.3.4		8.8	31	0	39.8
Regulated Vegetation - Regional Ecosystems within the Defined Distance of a Vegetation Management Watercourse					
RE 11.3.1	25a	0.2	1.1	0	1.3
RE 11.4.4	The relevant area of this MSES is equivalent to Natural Grasslands TEC, and the offset requirement is provided in Table A7-2.				
RE 11.9.3	30b	0.7	2.4	0	3.1
Regulated Vegetation - Essential Habitat					
Refer to Ornamental Snake below.					
Protected Wildlife Habitat					
<i>Solanum adenophorum</i>	N/A	0	0.2	0	0.2
Ornamental Snake (<i>Denisonia maculata</i>)	This is an MNES, offset requirement is provided in Table A7-2.				
Koala (combined populations of Queensland, NSW and the ACT) (<i>Phascolarctos cinereus</i>)	This is an MNES, offset requirement is provided in Table A7-2.				
Greater Glider (<i>Petauroides volans</i>)	This is an MNES, offset requirement is provided in Table A7-2.				
Squatter Pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	This is an MNES, offset requirement is provided in Table A7-2.				
Connectivity					
Remnant REs	N/A	324.3	225.6	19.4	569.3

RE = Regional Ecosystem.

The *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021) states that the State Government can only impose an offset condition in relation to a prescribed activity if the same matter has not been subject to assessment under the EPBC Act. The relevant MSES that are equivalent to MNES are identified in Table A7-4 as these matters will be offset under the EPBC Act.

E2M (2021) describes how the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020) was applied to the Project area. Section A7.3.4 describes how the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020) can be applied to the offset.

A7.2 PROJECT OFFSET STAGES

Biodiversity offsets would be established for the Project in stages, in accordance with the *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021) (Figure A7-3). The *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021) states that ‘offset staging will provide proponents with flexibility to adapt offset provision to operational and development changes over time that were not evident at the time of application for the relevant activity’. As required, the full extent of potential impacts on MNES and MSES from the Project has been taken into account as part of the significant residual impacts identified by E2M (2021).

The indicative surface disturbance extent contains land without MNES or MSES (Figure A7-3). This land does not have any matters of significance and therefore does not require offsetting. During the life of the Project, Whitehaven WS would progressively disturb this land without MNES or MSES.

A7.2.1 Description of the Offset Stages

Biodiversity offsets would be established for the Project in stages over the life of the Project with three indicative offset stages having been nominated (Figure A7-3). The clearance associated with the Stage 1 footprint has been quantified and this will represent the clearance limit for Stage 1. The stages are indicative and may vary slightly following further detailed mine planning, particularly the detailed design of supporting infrastructure, but Stage 1 clearance will not exceed the clearance limit. The infrastructure corridor which includes the raw water supply pipeline, ETL and mine access road, is assessed entirely within Stage 1 of the Project. Initial infrastructure including the MIA, CHPP, train load out facility and rail spur, would also be constructed within the first stage of the Project.

A7.2.2 Staged Offset Delivery

Whitehaven WS proposes a proponent-driven land-based offset for Stage 1 impacts to MNES and MSES. The proposed offset area is described in Section A7.3.

For subsequent stages (e.g. Stages 2 and 3), Whitehaven WS would submit an Offset Management Strategy to the Commonwealth Department of Climate Change, Energy, the Environment and Water for approval, that provides:

- details of the environmental offset/s (in hectares) for residual significant impacts of the proposed action on relevant MNES, and/or their habitat;
- details of how the environmental offset/s meets the requirements of the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy 2012* (DSEWPac, 2012a) and *Offsets Assessments Guide* (DSEWPac, 2012b);
- details of appropriate offset area/s (including a map) to compensate for the residual significant impact on relevant MNES, and/or their habitat; and
- details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation.

The three offset areas to be used for Stage 1 would partly offset impacts from a second stage of the Project. A desktop review of potential properties that could provide a land-based offset for Stages 2 and 3 impacts to MNES has been undertaken. This review demonstrates that there is sufficient land and values within the region to offset the impacts to MNES associated with Stages 2 and 3 (Table A7-5).

For MSES, a Notice of Election would be prepared and submitted to the DES prior to the commencement of each stage. The *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021) describes that a Notice of Election should be provided at least three months before the proposed commencement of the subsequent stage. The notification would identify the intended offset delivery approach, and whether the offset will be delivered as a:

- proponent-driven offset (i.e. a traditional land-based offset);
- financial settlement offset; or
- combination of proponent-driven offset and financial settlement offset.

Whitehaven WS would enter into an agreed delivery arrangement with the DES. This agreement forms a contract about how the offset would be delivered and can be amended by agreement between the two parties.

Table A7-5
Potential Offset Availability within the Region for Stages 2 and 3 Impacts
to Matters of National Environmental Significance

Relevant MNES	Potential Habitat ¹							
	Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7	Property 8
Ornamental Snake (<i>Denisonia maculata</i>)	2,493 ha	0 ha	721 ha	523 ha	8,786 ha	1,557 ha	6,096 ha	117 ha
Squatter Pigeon (southern subspecies) (<i>Geohaps scripta scripta</i>)	10,032 ha	17,499 ha	4,789 ha	7,831 ha	12,060 ha	31,811 ha	37,128 ha	10,517 ha
Koala (combined populations of Queensland, NSW and the ACT) (<i>Pharscolartos cinereus</i>)	9,781 ha	14,699 ha	7,885 ha	6,662 ha	11,451 ha	16,501 ha	12,875 ha	3,322 ha
Greater Glider (<i>Petauroides volans</i>)	714 ha	2,277 ha	4,487 ha	3,898 ha	9,808 ha	16,501 ha	12,875 ha	844 ha

¹ Based on publicly available regional data from the Queensland Government. Areas of potential habitat presented have been based on regional mapping using similar habitat definitions applied to Project disturbance areas.'

A7.3 STAGE 1 OFFSET FOR MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Whitehaven WS proposes land-based offset areas to address the Stage 1 offset requirements for the following referred Actions under the EPBC Act:

- the entire ETL (EPBC 2019/8458);
- the entire Water Pipeline (EPBC 2019/8459); and
- disturbance associated with the first stage of the Project which includes part of the Mine Site and Access Road (EPBC 2019/8460).

A7.3.1 Description of the Offset Area for Matters of National Environmental Significance

The proposed offset areas are listed in Table A7-6, and cover approximately 2,725 ha. The location of the offset areas are shown on Figure A7-11. The offset areas are within the Brigalow Belt North Interim Biogeographic Regionalisation for Australia Region, the same as the Project.

Table A7-6
Offset Area Description

Offset Area	Ownership	Area (ha)
Wynette Offset Area	Whitehaven WS	507
Ellensfield Offset Area	Private Landholder	1,341
Inderi Offset Area	Private Landholder	877
Total		2,725

The offset areas are described below. The offset for the Stage 1 impact area would not necessarily require all of the areas presented in Table A7-6. If there are residual areas in addition to that required to offset the Stage 1 impact area, these areas would be retained for use by subsequent offset stages (e.g. for Stages 2 and 3).

Wynette Offset Area

The Wynette property (Figure A7-12) is currently used for cattle grazing and contains large tracts of remnant vegetation with mature, hollow-bearing Blue Gums (*Eucalyptus tereticornis*). Patches of Poplar Box (*Eucalyptus populnea*) woodland are also present in the Wynette Offset Area in the form of RE 11.3.2 (Figure A7-12).

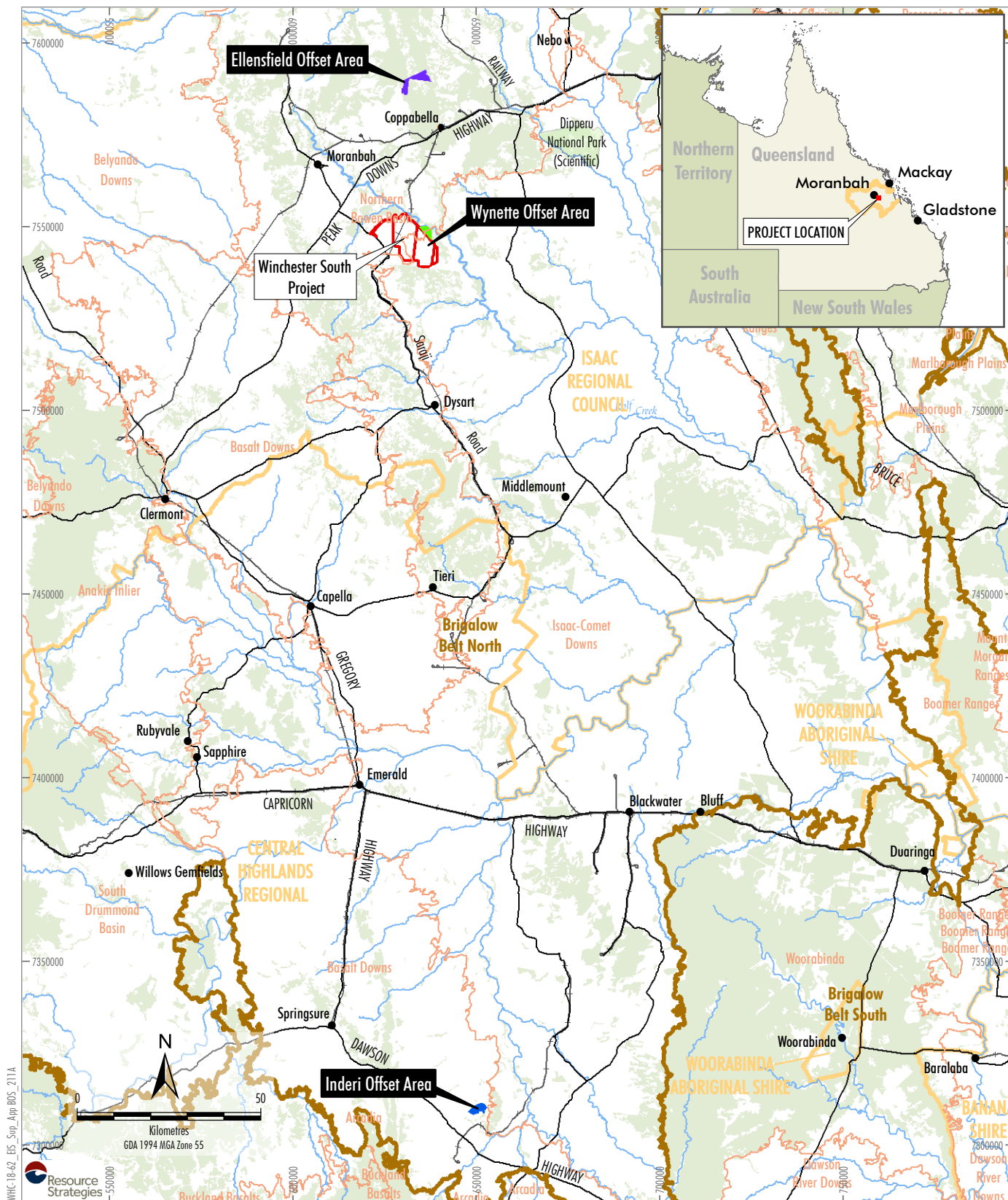
Ellensfield Offset Area

The Ellensfield property is shown on Figure A7-13 and is characterised by flat to undulating terrain with ironstone jump-ups. Much of the western part of the property has been cleared and is managed for livestock grazing; whereas the eastern part remains largely vegetated.

Inderi Offset Area

The Inderi property is natural grasslands and is made up of a number of smaller offset areas with the Inderi Offset Area largely characterised by improved pasture with pockets of remnant and regrowth vegetation (Figure A7-14).

Inderi Offset Area partly joins an existing Commonwealth offset area. The purpose of the adjoining offset is to protect Natural Grasslands TEC.

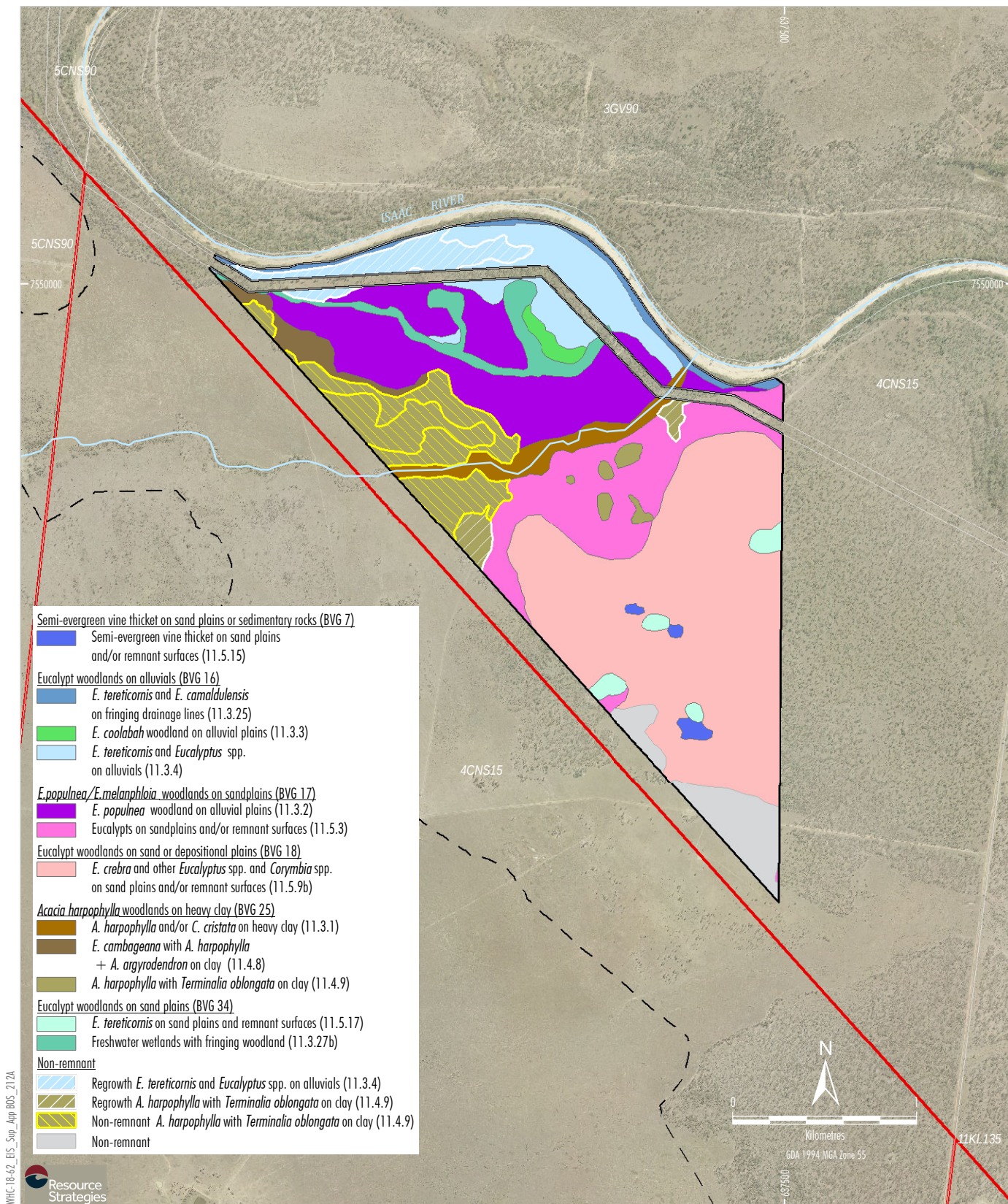


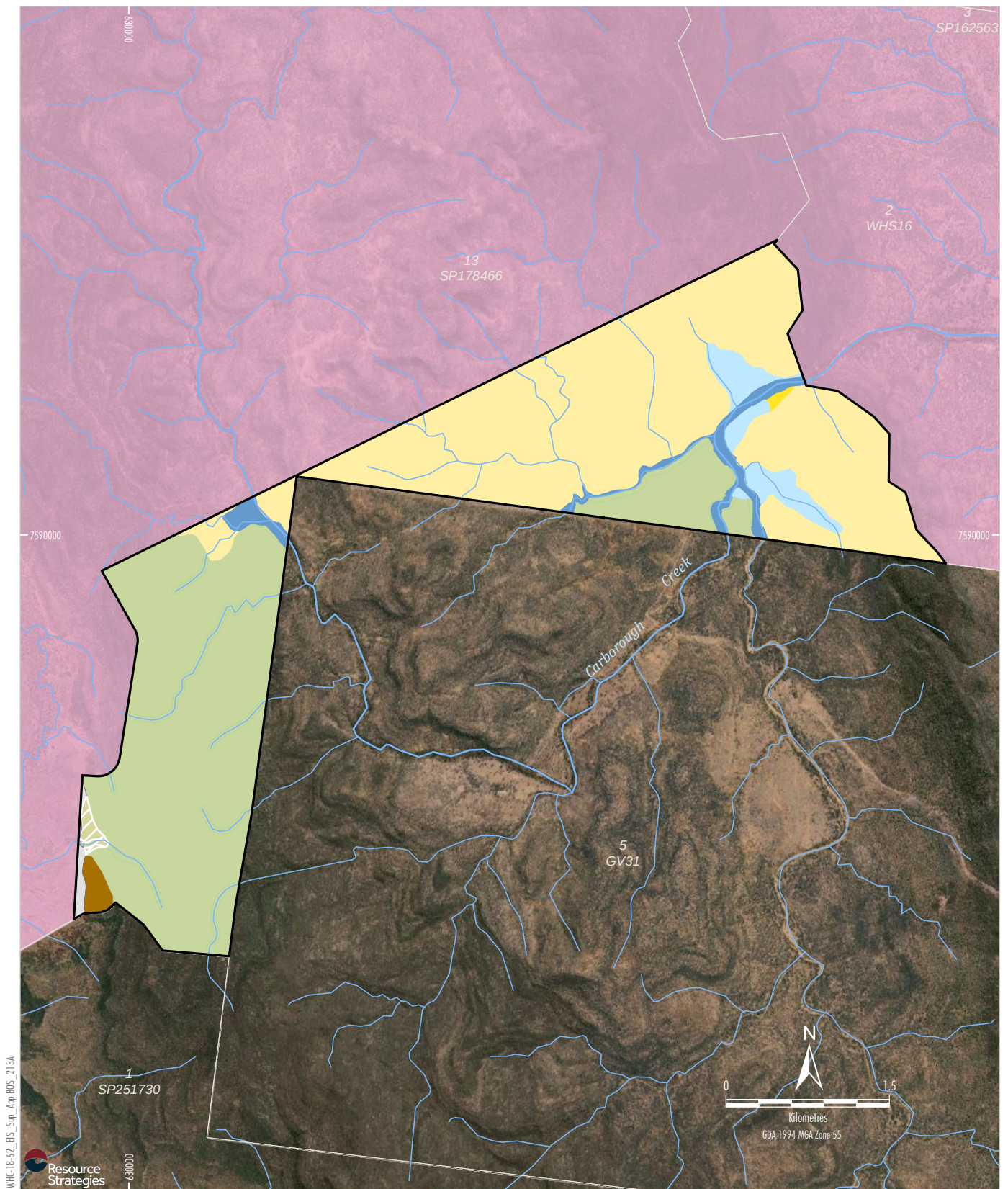
WHITEHAVEN COAL

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Offset Area Locations

Figure A7-11





LEGEND



Ellensfield Offset Area

Tenure



Freehold



Lands Lease

Semi-evergreen vine thickets on wide range of substrates (BVG 7)

Mixed Semi-evergreen vine thicket on sedimentary rocks (11.10.8),
Eucalyptus crebra, *Corymbia aureola*, *C. clarksoniana* and/or
Acacia shirleyi woodland on sedimentary rocks (11.10.4a),
E. crebra on coarse-grained sedimentary rocks (11.10.7)

Eucalypt woodland on coarse-grained sedimentary rocks (BVG 12)

Mixed *E. crebra* on coarse-grained sedimentary rocks (11.10.7),
E. crebra, *Corymbia aureola*, *C. clarksoniana* and/or
Acacia shirleyi woodland on sedimentary rocks (11.10.4a)
E. crebra on coarse-grained sedimentary rocks (11.10.7)

Eucalypt woodland on fine-grained sedimentary rocks (BVG 13)

E. crebra on fine-grained sedimentary rocks (11.9.9)

Eucalypt woodlands on alluvials (BVG 16)

E. tereticornis and *E. camaldulensis*
on fringing drainage lines (11.3.25)

E. tereticornis and *Eucalyptus* spp.
on alluvials (11.3.4)

Non-remnant

Regrowth *A. harpophylla* and/or *C. cristata*
on sedimentary rock (11.9.5)

Non-remnant

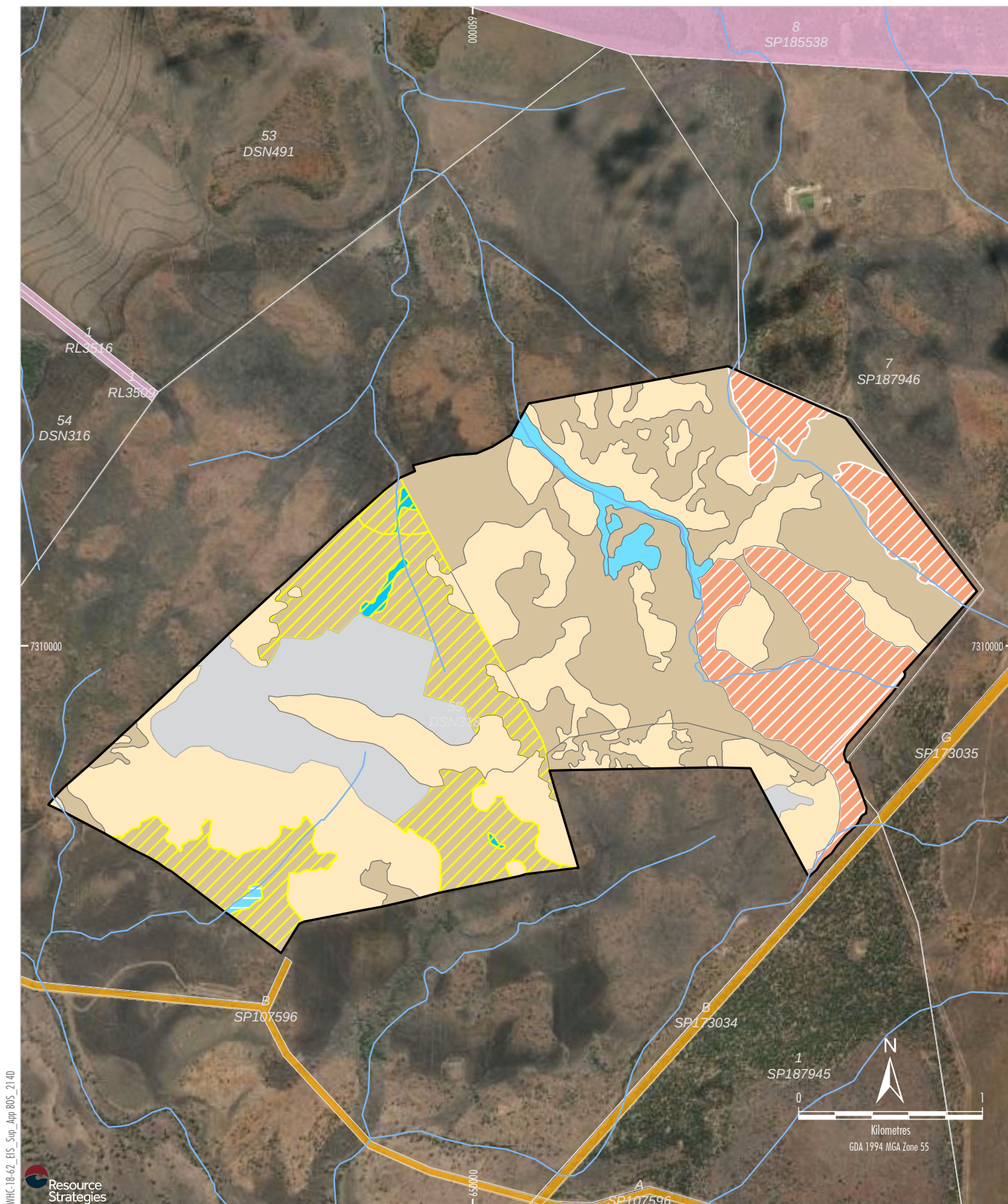
Source: The State of Queensland (2022); E2M (2022)
Orthophoto: Esri, Maxar, Earthstar Geographics, and the GIS
User Community (2022)



WINCHESTER SOUTH PROJECT

Ellensfield Offset Area
Ground-truthed Regional Ecosystems

Figure A7-13



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LEGEND

- Inderi Offset Area
- Tenure**
- Freehold
- Easement
- Lands Lease

Melaleuca spp. woodland on alluvial plains (BVG 21)

- Melaleuca bracteata* woodland on alluvial plains (11.3.3a)
- E. argadophila* on Cainozoic igneous rocks (11.8.5)

Tussock grasslands on forblands (BVG 30)

- Dichanthium sericeum* grassland on Cainozoic igneous rocks (11.8.11)

Non-remnant

- Regrowth *Eucalyptus* spp. and/or *Corymbia* spp. on Cainozoic clay plains (11.4.2)
- Regrowth *Melaleuca bracteata* woodland on alluvial plains (11.3.3a)
- Non-remnant Regrowth *Melaleuca bracteata* woodland on alluvial plains (11.3.3a)
- Non-remnant *Dichanthium sericeum* grassland on Cainozoic igneous rocks (11.8.11)
- Non-remnant

Source: The State of Queensland (2018 - 2020); E2M (2022)
Orthophoto: Esri, Maxar, Earthstar Geographics, and the GIS User Community (2022)



WINCHESTER SOUTH PROJECT

Inderi Offset Area Ground-truthed Regional Ecosystems

Figure A7-14

A7.3.2 Ecological Surveys of the Offset Areas

The terrestrial ecological values of each of the three offset areas were determined through a desktop assessment and a series of field assessments between May 2020 and May 2021.

Ground-truthing and validating vegetation community mapping (Figures A7-12 to A7-14) were conducted in accordance with the Queensland Government's *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.*, 2022). Threatened ecological community assessments (Figures A7-15 and A7-16) were undertaken to verify if key diagnostic characteristics and condition thresholds for EPBC Act-listed threatened ecological communities were met. Habitat Quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020).

Initial targeted fauna surveys were undertaken using standard methods (e.g. diurnal searches for Koala, spotlighting, transects, etc.), however, the field surveys were conducted outside of the optimal conditions and therefore do not reflect the complete extent of the species. Habitat assessments indicate that the species are likely to be more widespread on the offset areas than identified through the surveys.

A7.3.3 Matters of National Environmental Significance in the Offset Area

The Terms of Reference for the EIS require this document to provide:

- (d) details of appropriate offset area/s (including a map) to compensate for the residual significant impact on relevant MNES, and/or their habitat;

The subsections below describe the size and location of the offsets proposed for each relevant MNES.

Natural Grasslands TEC

The Stage 1 residual significant impacts on Natural Grasslands TEC would be offset in the Inderi Offset Area. The Natural Grasslands TEC in the Inderi Offset Area is shown on Figure A7-16.

The Native Grasslands in the offset area are associated with REs 11.8.11 and 11.8.11a. These vegetation communities were found to be associated with gently undulating cracking clay plains and loamy-clay plains over underlying fine-grained sedimentary rock. The vegetation communities are dominated by native grasses including, but not limited to, *Dichanthium sericeum*, *Panicum decompositum*, *Sehima nervosum*, and *Aristida latifolia*.

Ornamental Snake

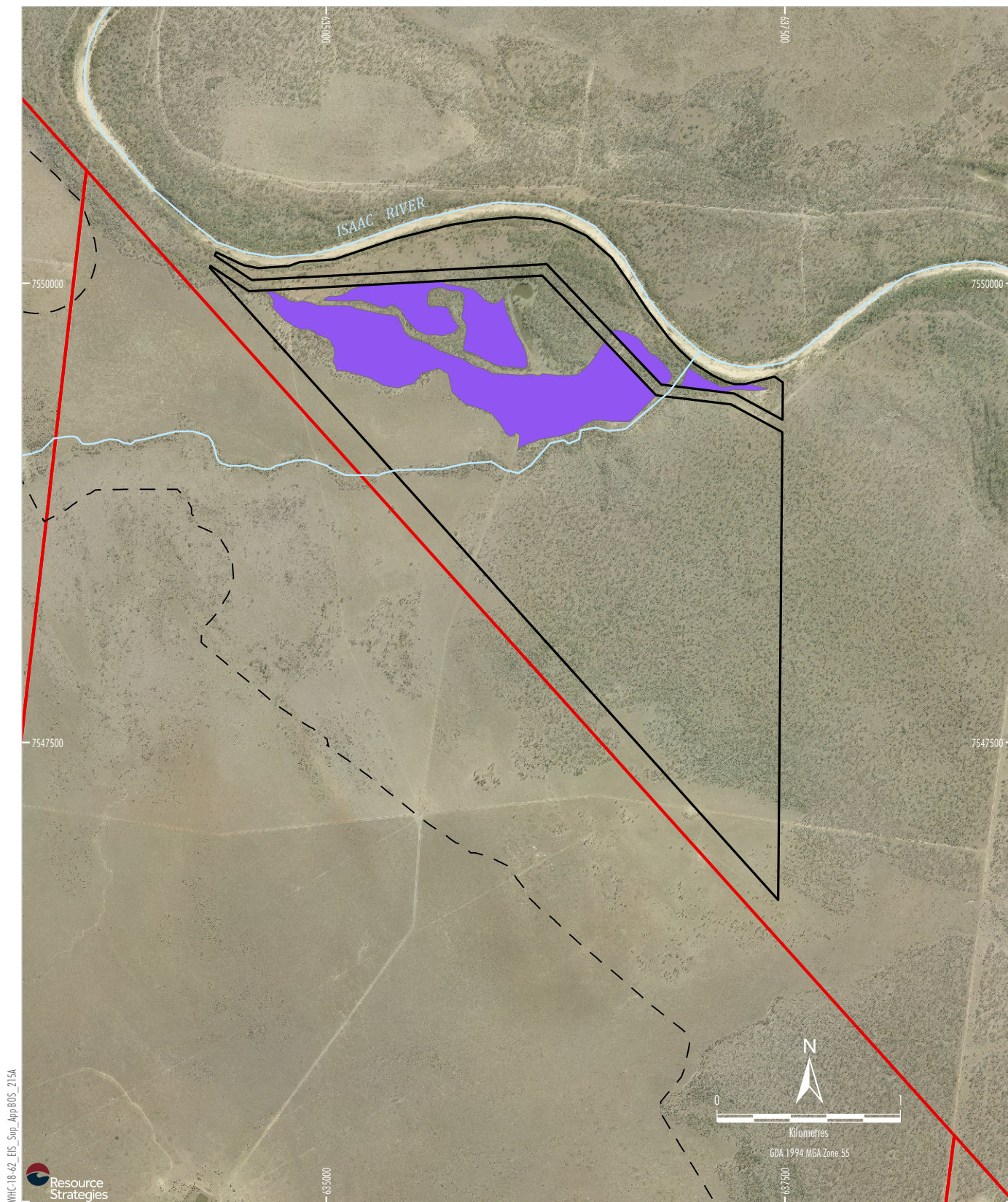
The Stage 1 residual significant impacts on the Ornamental Snake would be offset in the Wynette Offset Area. The potential habitat for the Ornamental Snake is brigalow-dominant communities characterised by gilgai with cracking, clay soils (REs 11.3.1, 11.4.8 and 11.4.9), and regrowth patches of REs 11.4.8 and 11.4.9 where suitable microhabitat features were present to support the species (Figure A7-17).

Squatter Pigeon (southern subspecies)

The Stage 1 residual significant impacts on the Squatter Pigeon (southern subspecies) would be offset in the Wynette Offset Area (Figure A7-18). Potential foraging and breeding habitat mapped in the Wynette Offset Area (Figure A7-18), is inclusive of remnant and regrowth vegetation.

Koala (combined populations of Queensland, NSW and the ACT)

The Stage 1 residual significant impacts on the Koala would be offset in the Wynette Offset Area (Figure A7-19). Koala habitat was mapped within the Wynette Offset Area (Figure A7-19) with additional potential habitat mapped associated with remnant and regrowth REs. Three Koalas were observed in the Wynette Offset Area (Figure A7-19), and indirect evidence of Koala presence (i.e. scats and/or scratches) was also found across the two properties (Figure A7-19 and A7-20).



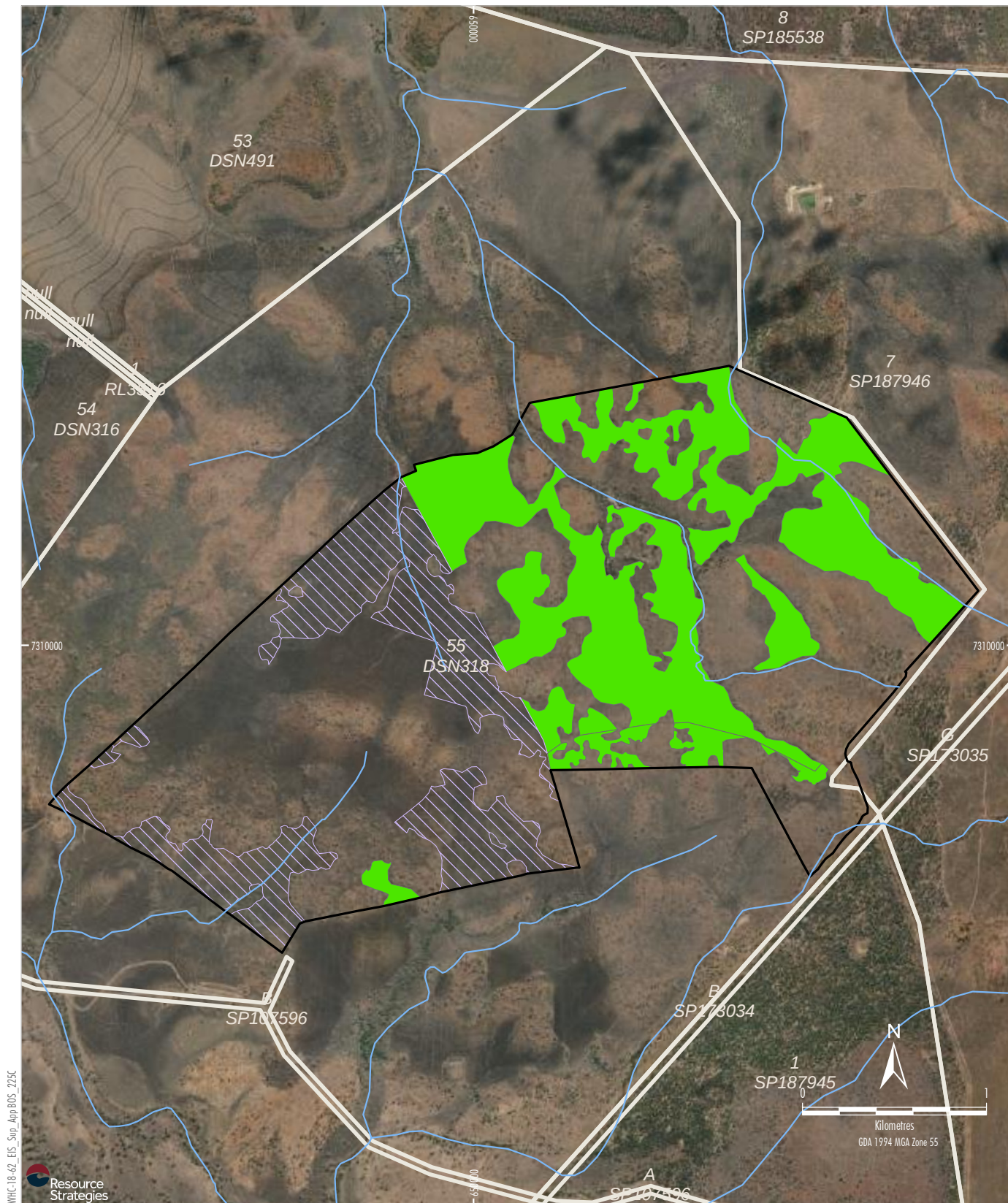
LEGEND

- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- Wynette Offset Area
- Threatened Ecological Community
- Poplar Box community that does not currently meet the Poplar Box TEC criteria

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)


WINCHESTER SOUTH PROJECT
Wynette Offset Area
Threatened Ecological Community

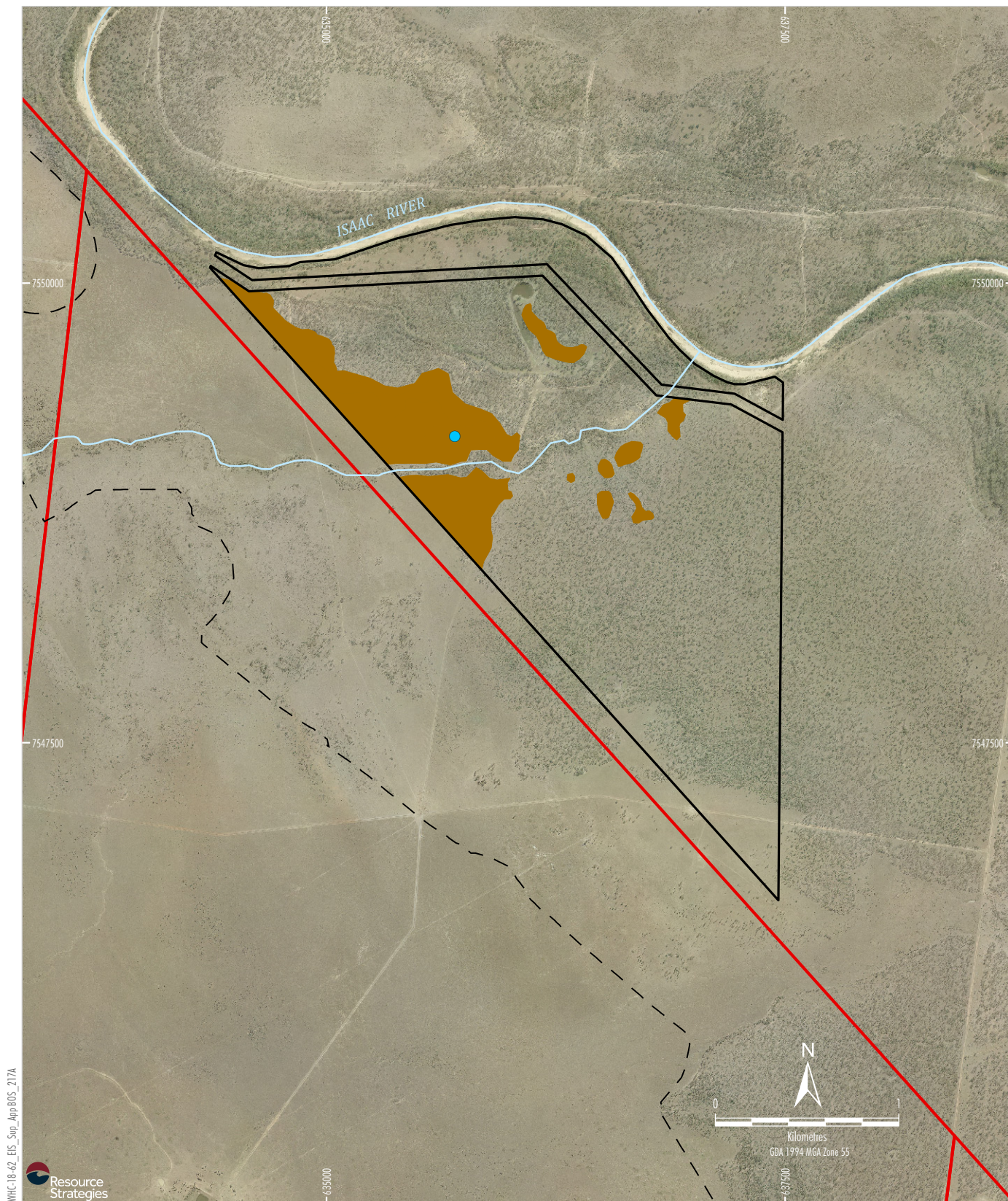
Figure A7-15



- LEGEND**
- Inderi Offset Area
 - Threatened Ecological Community
 - Natural Grassland of the Queensland Central Highlands and Northern Fitzroy Basin
 - Poor quality grassland that does not meet the Natural Grasslands TEC criteria

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2021)
Orthophoto: Google (2019); Whitehaven (2017)

Figure A7-16



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- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Wynette Offset Area
 - Potential Habitat**
 - Ornamental Snake Important Habitat
 - Ornamental Snake Record (E2M, 2021)

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)


WINCHESTER SOUTH PROJECT
Wynette Offset Area
Ornamental Snake Habitat

Figure A7-17



WHC-18-62_EIS_Sup_App_BOS_218A



LEGEND

- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- Wynette Offset Area
- Potential Habitat
- Squatter Pigeon Breeding and Foraging Habitat

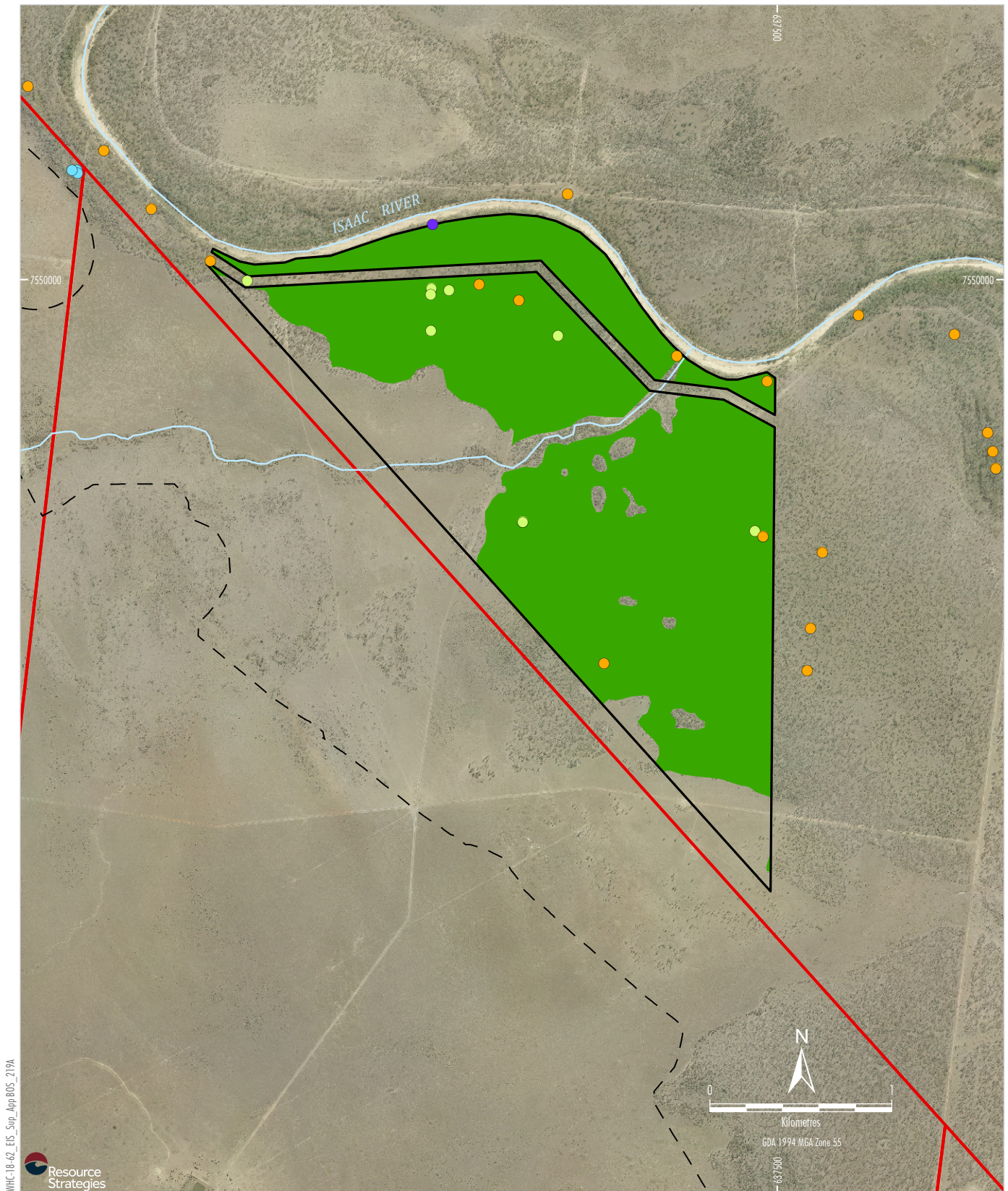
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)



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Wynette Offset Area
Squatter Pigeon (southern subspecies)
Habitat

Figure A7-18

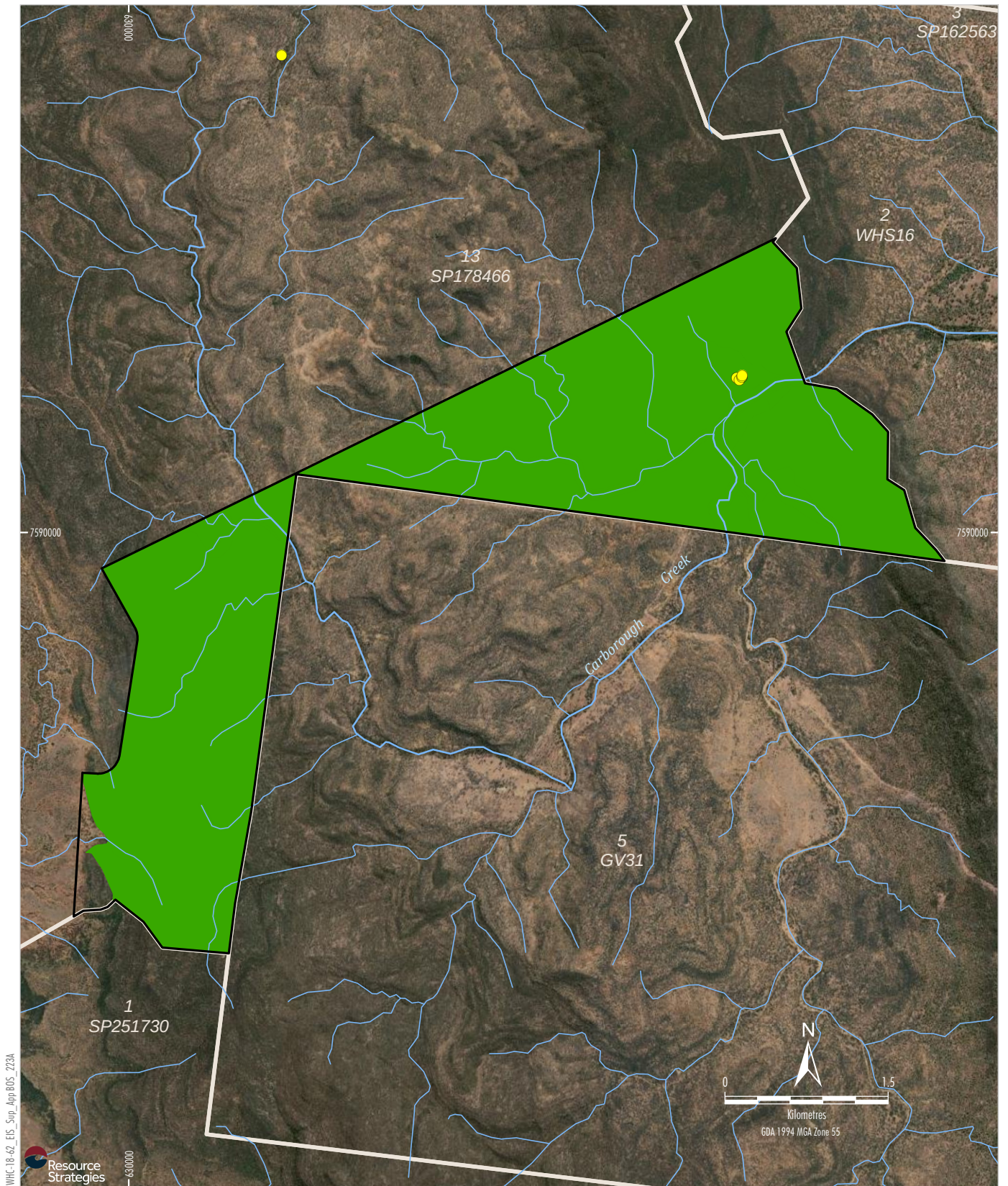


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- LEGEND**
- Mining Lease Application Boundary
 - Indicative Surface Disturbance Extent
 - Wynette Offset Area
 - Potential Habitat**
 - Koala Habitat (Potential Breeding and Foraging)
 - Koala Records (E2M, 2021)
 - Koala Records (E2M, 2020)
 - Koala Record (E2M, 2019)
 - Koala Record (Previous Studies)

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)


WINCHESTER SOUTH PROJECT
Wynette Offset Area
Koala (combined populations of Queensland, NSW and the ACT) Habitat
Figure A7-19



- LEGEND**
- Ellensfield Offset Area
- Potential Habitat**
- Koala Habitat (Potential Breeding and Foraging)
- Koala Records (E2M, 2021)

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)

Greater Glider

The Stage 1 residual significant impacts on the Koala would be offset in the Wynette and Ellensfield Offset Areas (Figures A7-21 and A7-22). Four Greater Gliders were observed in the Wynette Offset Area (Figure A7-21) during field surveys undertaken in 2020 and a Greater Glider was also observed in the Ellensfield Offset Area (Figure A7-22) during field surveys in May 2021. Potential denning and foraging habitat for the species was recorded on both the Wynette and Ellensfield Offset Areas associated with remnant patches of REs 11.5.3, 11.3.2, 11.3.4, 11.3.25 and 11.5.17.

Summary

The Terms of Reference for the EIS require this document to provide:

- (a) details of the environmental offset/s (in hectares) for residual significant impacts of the proposed action on relevant MNES, and/or their habitat;

Table A7-7 provides a summary of the quantities of habitat for MNES in the Stage 1 impact areas and offset areas. More information on the Stage 1 Offset Areas and the offset percentages are provided in Appendix A, and additional information related to the MNES and MSES present within the Offset Areas is provided in the baseline offset survey reports (Appendix B and Appendix C).

As described in Section A7.3.1, the offset for the Stage 1 impact area would not necessarily require all of the areas presented in Table A7-6 and Table A7-7. If there are residual areas in addition to that required to offset the Stage 1 impact area, these areas would be retained for use by subsequent offset stages (e.g. for Stages 2 and 3).

Table A7-7
Stage 1 Offset Areas for Matters of National Environmental Significance

Matters of National Environmental Significance	Stage 1 Impact Area (ha) ¹	Available Offset (Figures A7-15 to A7-22) [#] (ha)	Available Offset Used (ha)	Total Stage 1 Offset (%)
Natural Grasslands TEC	80.9	227.74	215 ha in Inderi	> 100
Ornamental Snake (<i>Denisonia maculata</i>)	50	70.76	63.5 ha in Wynette	> 100
Squatter Pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	53.8	236.23	192 ha in Wynette	> 100
Koala (combined populations of Queensland, NSW and the ACT) (<i>Phascolarctos cinereus</i>)	78.2	1,719.48	285 ha in Wynette	> 100
Greater Glider (<i>Petauroides volans</i>)	42.1	316.69	153.66 ha (88.66 ha in Ellensfield, and 65 ha in Wynette)	> 100

¹ Disturbance associated with the Electricity Transmission Line (EPBC 2019/8458) and Water Pipeline (EPBC 2019/8459) within MLA 700049, MLA 700050, MLA 700051 and MLA 700065 is assessed under the Mine Site and Access Road (EPBC 2019/8460).

[#] Note: The extent of the offset boundary shown on Figures A7-12 to A7-14 may be used in full or in part for any stage of the Project's offset requirements. Any area not required for any particular stage, or the Project in full may be retained for future use.

The Terms of Reference for the EIS require this document to provide:

- (e) information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors;

The Wynette Offset Area joins the continuous riparian corridor of the Isaac River. The Inderi Offset Area partly joins an existing Commonwealth offset area. The purpose of the adjoining offset is to protect Natural Grasslands TEC.



LEGEND

- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- Wynette Offset Area

Potential Habitat

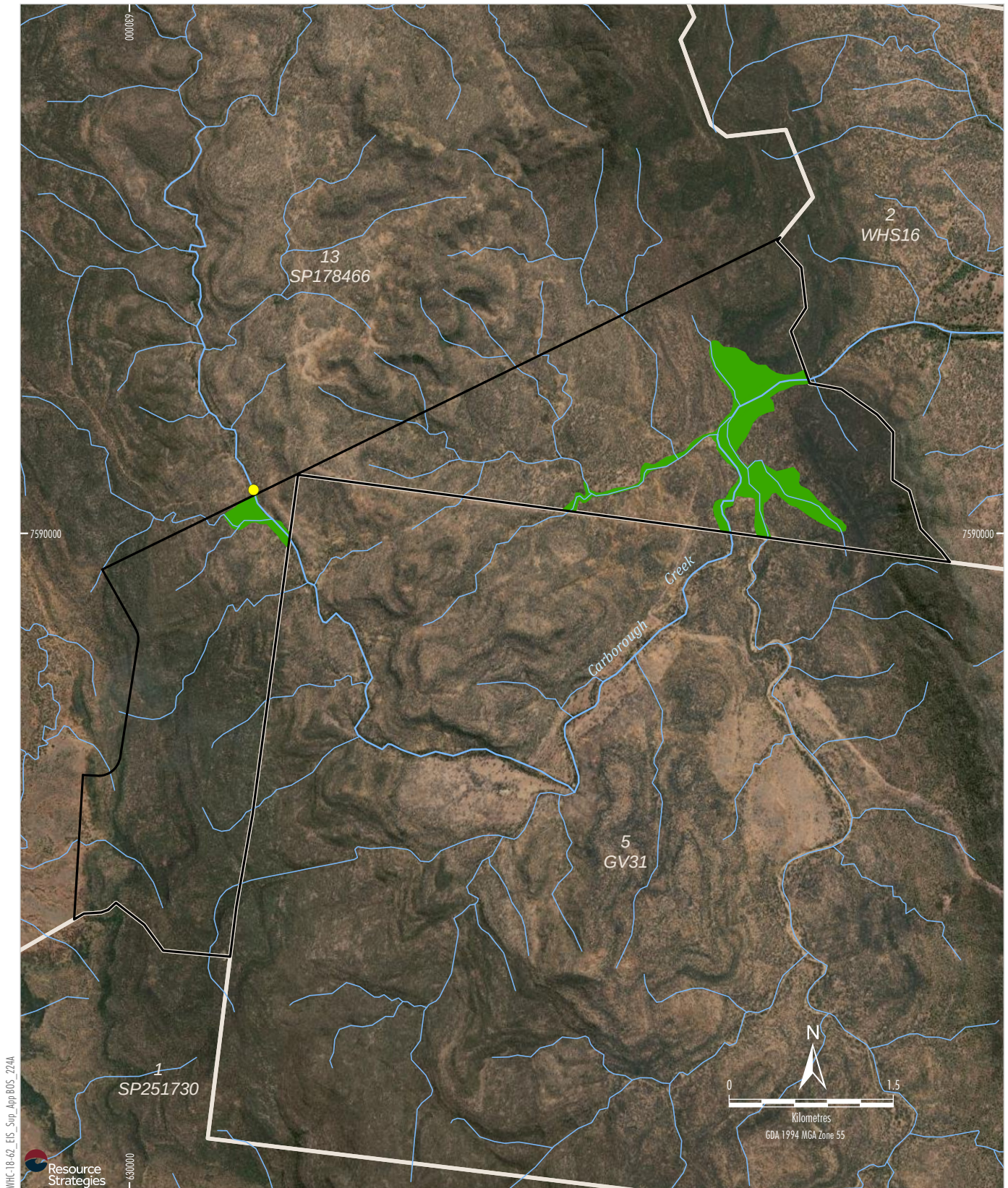
- Greater Glider Habitat (Potential Breeding and Foraging)
- Greater Glider (E2M, 2020)
- Greater Glider (Previous Studies)

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)

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**Wynette Offset Area
Greater Glider Habitat**

Figure A7-21



- LEGEND**
- Ellensfield Offset Area
 - Potential Habitat**
 - Greater Glider Habitat (Potential Breeding and Foraging)
 - Greater Glider Record (E2M, 2021)

Source: The State of Queensland (2018 - 2020);
 Whitehaven (2020); E2M (2022)
 Orthophoto: Esri, Maxar, Earthstar Geographics, and the GIS
 User Community


WINCHESTER SOUTH PROJECT
Ellensfield Offset Area
Greater Glider Habitat

Figure A7-22

A7.3.4 Reconciliation of the Offset Areas Against Commonwealth Offset Principles

The Terms of Reference for the EIS require this document to provide:

- (b) details of how the environmental offset/s meets the requirements of the Department's EPBC Act 1999 Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide;

A reconciliation of the Offset Management Strategy against the Commonwealth offset principles (DSEWPaC, 2012a) is presented in Table A7-8. The offset areas meet the requirements of the EPBC Act 1999 Environmental Offsets Policy (DSEWPaC, 2012a), including the Offsets Assessments Guide (DSEWPaC, 2012b).

Table A7-8
Reconciliation of the Offset Areas against the Commonwealth Offset Principles

Offset Principles ¹	Elements of the Offset Areas that Address these Principles
1. deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environmental law and affected by the action	The Offset Areas directly contribute to the ongoing viability of the specific protected matter impacted i.e. 'like for like' outcome. The conservation benefit from the Offset Areas would be the long-term security and management of larger areas of habitat, than would be disturbed by the Project.
2. be built around direct offsets but may include other compensatory measures	Whitehaven WS has elected to address the Commonwealth offset requirements for Stage 1 of the Project by offsetting through land based offset areas.
3. be in proportion to the level of statutory protection that applies to the protected matter	The land-based offset areas would satisfy 100% of the offset requirements for each threatened species and community potentially impacted by Stage 1.
4. be of a size and scale proportionate to the impacts on the protected matter	The size and scale of the offset was determined using the Offsets Assessments Guide (DSEWPaC, 2012b). This takes into consideration specific attributes of the relevant protected matters and the quality and importance of the habitat.
5. effectively account for and manage the risks of the offset not succeeding	The implementation of the Offset Areas is likely to be an approval condition for the Project.
6. be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action, see section 7.6)	The implementation of the Offset Areas is beyond existing requirements, in that the offsets are not part of any private conservation reserve system. The enduring protection that would be applied to the Offset Areas is new and additional to what is required under duty of care or any environmental planning laws.
7. be efficient, effective, timely, transparent, scientifically robust and reasonable	The size and scale of the offset was determined using the Offsets Assessments Guide (DSEWPaC, 2012b).
8. have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The proposed offset areas would be secured as described in Section A7.3.6.

¹ DSEWPaC (2012a).

A7.3.5 Management Measures

Table 7-9 outlines the management measures proposed by Whitehaven WS for the offset areas, albeit are subject to review as part of securing the offset areas and developing the Offset Management Plans.

Table A7-9
Proposed Offset Area Management Measures

Management Measure	Rationale	Relevant Offset Areas
Livestock management	Installation and maintenance of stock proof fencing: Installation and maintenance of stock proof fence would allow for effective controlled grazing to take place and exclude livestock when required. Controlled grazing of livestock: Monitoring of livestock grazing intensity would assist in improving the cover and composition of native species in the ground cover as well as minimise the potential spread of exotic grasses. Specifically, grazing during dry season to reduce exotic ground cover, and limiting/excluding grazing during the wet season to prevent soil compaction. No grazing within Squatter Pigeon (southern subspecies) habitat during the breeding season (April to end October). Exclusion of livestock during the wet season: Exclusion of livestock during the wet season would reduce soil compaction and enable native groundcover species to flower and set seed, increasing native cover and diversity over time. Exclusion of livestock from the Inderi Offset Area.	Wynette Offset Area Inderi Offset Area Ellensfield Offset Area
Weed control	Weed identification: Detailed field survey of weeds is required to identify the distribution and type of species present at Year 1 (baseline data). This would allow for prioritisation of potential hot spots and high-risk species. Weed prevention: Control of weeds is difficult once established/introduced. Prevention of introduction or further spread would increase the success rate of weed management across the offset area. Weed control: Weed control would reduce the extent and abundance of weeds across the offset areas, which in turn would assist in improving native species richness and recruitment.	Wynette Offset Area Inderi Offset Area Ellensfield Offset Area
Pest animal control	Pest fauna identification: Detailed field survey of pest fauna is required to identify the distribution and type of species present. This would allow for prioritisation of potential hot spots and high-risk species (e.g. wild dogs and pigs). Pest fauna prevention: Control of pest fauna is difficult once established/introduced. Prevention of introduction or further spread would increase the success rate of pest management across the offset area. Pest fauna control: Pest fauna control would reduce the abundance of pest fauna across the offset areas, which would in turn reduce predation risk of threatened fauna, reduce habitat degradation through tramping and pig-rooting, and reduce the potential spread of weeds.	Wynette Offset Area Inderi Offset Area Ellensfield Offset Area
Fire management	Fire management program: Altered fire regimes are interrelated with confounding environmental threats including weed encroachment, changes to vegetation structure and damage to fire sensitive vegetation communities. As such, a fire management program, produced by a suitably qualified professional, would be established for the offset area and incorporate fire guidelines for REs present. Fire breaks: Fire breaks would be established along existing fence lines and any new fencing that is to be installed. This would reduce the risk of uncontrolled burns which may negatively affect the offset areas.	Wynette Offset Area Inderi Offset Area Ellensfield Offset Area
Vegetation regrowth management	Thinning of dense undesirable regrowth: Where regrowth becomes un-naturally thick and dominated by species not consistent with the pre-cleared RE, vegetation thinning may occur to assist in achieving mature vegetation consistent with the prescribed RE.	Wynette Offset Area
Barbed wire fencing management	Barbed wire fencing within and surrounding the offset areas (that presents a risk of entanglement) would be modified so the top strand is plain wire fencing.	Wynette Offset Area Ellensfield Offset Area
Greater Glider Nest Box Programme	Installation and maintenance of 60 nest boxes: designed specifically for the Greater Glider (i.e. contains features that would benefit use by the gliders). Monitoring: using Smart Nest Box principles (i.e. boxes fitted with video/audio data collection capability).	Wynette Offset Area Ellensfield Offset Area

Offset Management Plans would be prepared for the offset areas by a suitably qualified person and include:

- the results of a field validation survey and baseline description of the current condition of the offset areas, including relevant MNES and/or their habitat;
- a description, and figures, clearly defining the location and boundaries of the proposed offset areas, including the attributes of the offsets;
- a description of the management measures (including timing, frequency and duration) that would be implemented in the offset areas;
- a discussion of how proposed management measures take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans¹;
- completion criteria and performance targets for evaluating the effectiveness of the Offset Management Plan implementation, and criteria for triggering corrective actions;
- a program to monitor, report on and review the effectiveness of the Offset Management Plan; and
- a description of potential risks to the successful implementation of the offset areas, and contingency measures that would be implemented to mitigate against these risks.

The Offset Management Plans would be prepared in accordance with the *Environmental Management Plan Guidelines* (Department of the Environment [DoE], 2014) and the requirements to secure the offset areas under Queensland legislation.

A7.3.6 Legal Security

The Terms of Reference for the EIS require this document to provide:

- (f) *details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation.*

There are a number of mechanisms by which Whitehaven WS can legally secure and manage offset areas for the Project. The currently preferred mechanism is to establish a legally binding agreement(s) with the current registered landholder(s). This could be achieved by establishing an Offset Agreement with the current registered landholder(s) to enter a Voluntary Declaration under the *Vegetation Management Act 1999*.

Any such Offset Agreement is expected to include a payment by Whitehaven WS to the current registered landholder for the registration of the Voluntary Declaration, as well as payment for any management required by the relevant Offset Management Plan. Whitehaven WS would be responsible for separately funding and coordinating any required monitoring.

In accordance with the *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021), the requirement for a legally secured offset will cease to have effect once the:

- administering agency is satisfied the actions and obligations of the offset delivery plan have been completed in full; and
- the offset has been secured for at least the same duration as the impact on the prescribed environmental matters arising from the prescribed activity.

¹ The following threat abatement plans would be considered in the Offset Management Plans:

- *Threat Abatement Plan for Predation by Feral Cats* (DoE, 2015);
- *Threat Abatement Plan for Competition and Land Degradation by Rabbits* (Department of the Environment and Energy [DEE], 2016);
- *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs* (DEE, 2017); and
- *Threat Abatement Plan for Predation by the European Red Fox* (Department of the Environment, Water and Heritage Protection, 2008).

A7.4 STAGE 1 OFFSET FOR MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

The significant residual impacts on MSES from Stages 1 to 3 are provided in Table A7-4. The offset for impacts on MSES for Stage 1 is likely to include part of one or more of the offset areas identified for MNES (Section A7.3.1). The MNES within the Wynette, Ellensfield and Inderi Offset Areas are shown on Figures A7-23 to A7-25. As described in Section A7.2.2, a Notice of Election would be prepared and submitted to the DES prior to the commencement of Stage 1 which would identify the intended offset delivery approach.

For a land-based offset, an offset area must be capable of delivering a conservation outcome for the impacted prescribed environmental matter. The suitability of the offset site would be measured using the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020). The offset requirement for a significant residual impact on a prescribed environmental matter is set at a maximum multiplier of 4 (i.e. a maximum of four times the area of the significant residual impact), with the exception of impacts to connectivity, for which the offset requirement is set at a multiplier of 1 (DES, 2021).

A7.4.1 Regulated Vegetation

Stage 1 would require an offset for Endangered and Of Concern regional ecosystems (Table A7-4). An offset area for Endangered and Of Concern regional ecosystems would be (DES, 2021):

- of the same broad vegetation group as the impacted regional ecosystem;
- of the same regional ecosystem status; and
- within the same bioregion.

The State Government can only impose an offset condition in relation to a prescribed activity if the same matter has not been subject to assessment under the EPBC Act. Table A7-4 identifies a regional ecosystem within the defined distance of a vegetation management watercourse that is equivalent to the Natural Grasslands TEC and therefore would be offset by the Commonwealth offset.

A7.4.2 Regional Ecosystems within the Defined Distance of a Vegetation Management Watercourse

Stage 1 would require an offset for regional ecosystems within the defined distance of a vegetation management watercourse (Table A7-4). An offset area of this MSES would be (DES, 2021):

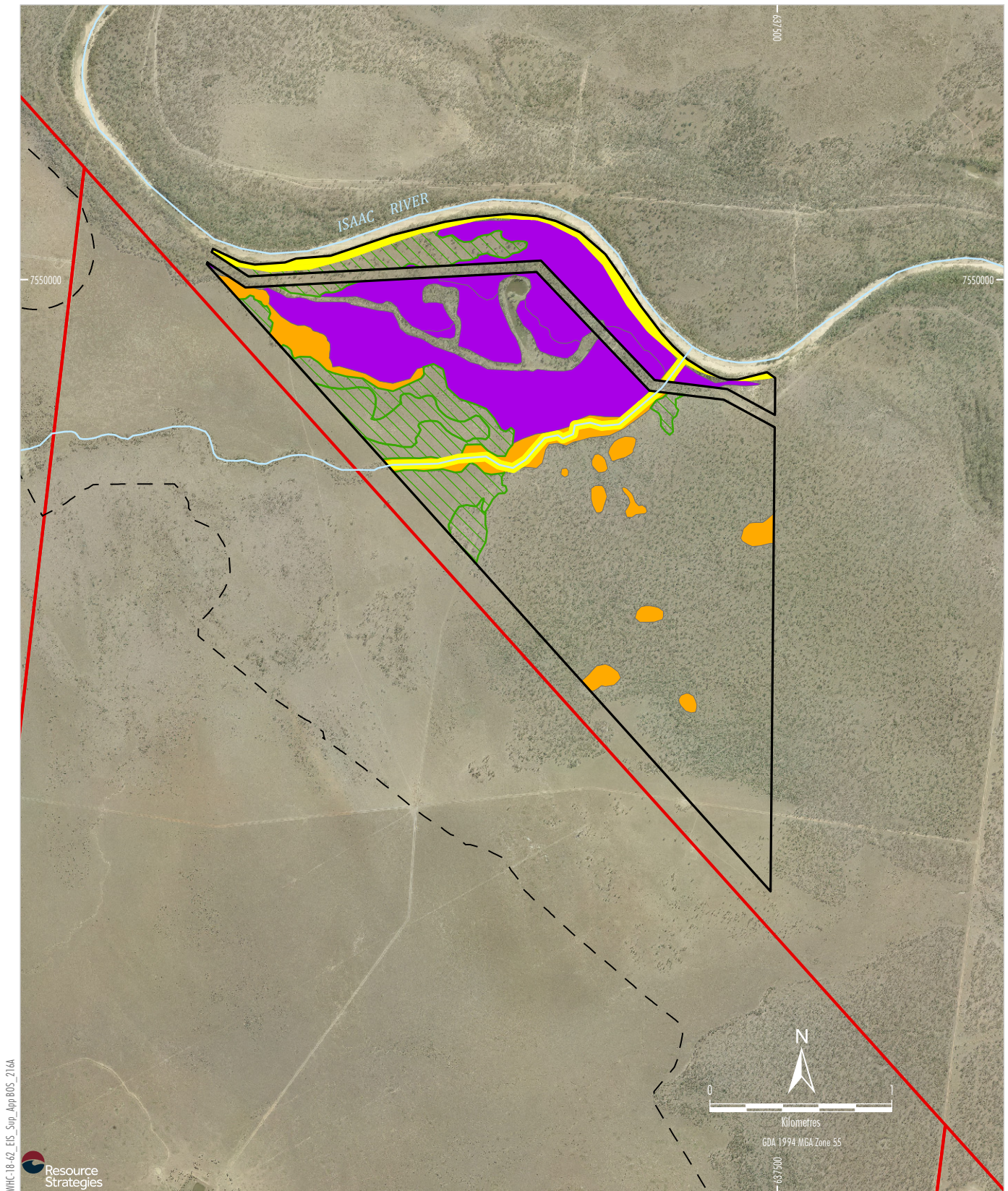
- of the same broad vegetation group as the impacted regional ecosystem;
- within the same bioregion; and
- associated with a watercourse or drainage feature.

Table A7-4 identifies regional ecosystems that are equivalent to the Natural Grasslands TEC and therefore would be offset by the Commonwealth offset.

A7.4.3 Protected Wildlife Habitat

The *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021) states that the State Government can only impose an offset condition in relation to a prescribed activity if the same matter has not been subject to assessment under the EPBC Act.

Table A7-4 identifies fauna species listed under the *Nature Conservation Act 1992* (NC Act) and EPBC Act would be offset by the Commonwealth offset. Significant residual impacts on *Solanum adenophorum* (a plant listed under the NC Act but not the EPBC Act) are identified in Table A7-4. In relation to a plant that is endangered wildlife under the NC Act, an offset area must contain, or be capable of containing, a self-sustaining population of that same impacted species (DES, 2021).



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LEGEND

- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- Wynette Offset Area
- Matters of State Environmental Significance
- Regulated Vegetation
- Endangered Regional Ecosystem
(11.3.1, 11.4.8, 11.4.9, 11.5.17)
- Of Concern Regional Ecosystem
(11.3.2, 11.3.3, 11.3.4)
- Regional Ecosystem within the Defined Distance
of a Vegetation Management Watercourse
- Connectivity
- Non-remnant Vegetation

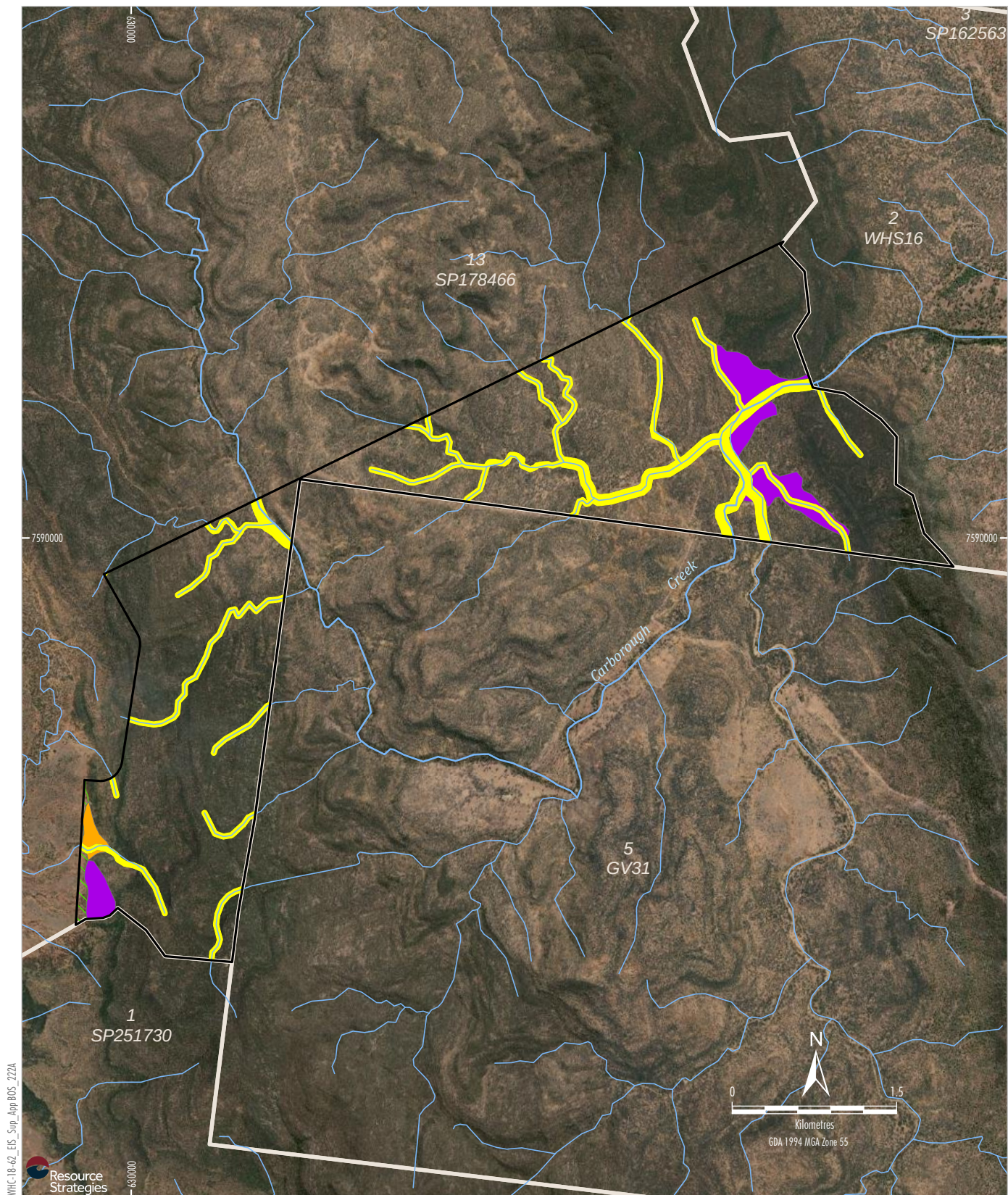
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Google (2019); Whitehaven (2017)



WINCHESTER SOUTH PROJECT

Wynette Offset Area
Matters of State Environmental Significance

Figure A7-23



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- LEGEND**
- Ellensfield Offset Area
 - Matters of State Environmental Significance**
 - Regulated Vegetation**
 - Endangered Regional Ecosystem (High-value Regrowth 11.9.5)
 - Of Concern Regional Ecosystem (11.10.8/11.10.4a/11.10.7, 11.3.4)
 - Regional Ecosystem within the Defined Distance of a Vegetation Management Watercourse
 - Connectivity**
 - Non-remnant

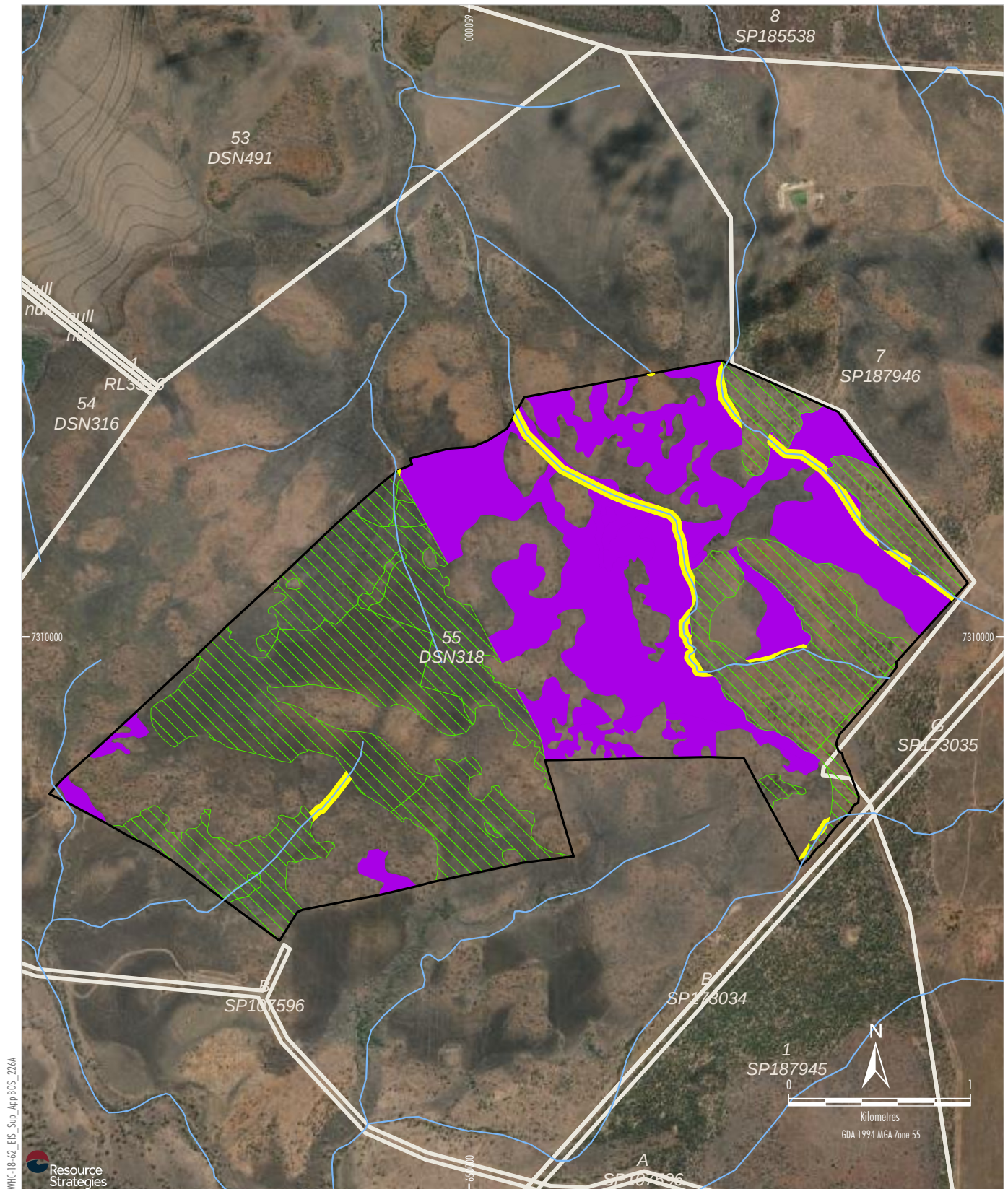
Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Esri, Maxar, Earthstar Geographics, and the GIS
User Community

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Ellensfield Offset Area
Matters of State Environmental Significance

Figure A7-24



WHC-18-62 EIS Sup App BOS 226A

- LEGEND**
- Inderi Offset Area
 - Matters of State Environmental Significance
 - Regulated Vegetation
 - Of Concern Regional Ecosystem (11.3.3a, 11.8.11)
 - Regional Ecosystem within the Defined Distance of a Vegetation Management Watercourse
 - Connectivity
 - Non-remnant

Source: The State of Queensland (2018 - 2020);
Whitehaven (2020); E2M (2022)
Orthophoto: Esri, Maxar, Earthstar Geographics, and the GIS
User Community

WHITEHAVEN COAL

WINCHESTER SOUTH PROJECT

Inderi Offset Area
Matters of State Environmental Significance

Figure A7-25

A7.4.4 Connectivity

Stage 1 would require an offset for impacts on connectivity. For connectivity the offset site must be (DES, 2021):

- a non-remnant ecosystem; and
- in the same subregion; however, if the subregion is intact, the offset should be in the nearest fragmented subregion.

A7.5 STAGE 2 OFFSET FOR MATTERS OF NATIONAL AND STATE ENVIRONMENTAL SIGNIFICANCE

The three offset areas (Wynette Offset Area, Ellensfield Offset Area, and Inderi Offset Area) would sufficiently offset the impacts from Stage 1 of the Project on the relevant MNES and MSES, as listed above, and partly offset impacts from a second stage of the Project as shown below in Table A7-10 and Table A7-11.

Table A7-10
Stage 2 Offset Areas for Matters of National Environmental Significance

Matters of National Environmental Significance	Stage 2 Impact Area (ha)	Wynette Offset Area (ha)	Ellensfield Offset Area (ha)	Percentage Offset
Poplar Box TEC	9.6	50	0	100.69 %
Ornamental Snake (<i>Denisonia maculata</i>)	1,523.1	7.26	0	0.48 %
Squatter Pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	61.7	44.22	0	20.16 %
Koala (combined populations of Queensland, NSW and the ACT) (<i>Phascolarctos cinereus</i>)	90.7	116.32	215	100.75 %
Greater Glider (<i>Petauroides volans</i>)	90.7	163.03	0	49.57 %

Table A7-11
Stage 2 Offset Areas for Matters of State Environmental Significance

Matters of State Environmental Significance	Stage 2 Impact Area (ha)	Wynette Offset Area (ha)	Ellensfield Offset Area (ha)	Inderi Offset Area (ha)	Percentage Offset
Regulated Vegetation – Endangered Regional Ecosystem					
11.3.1	59.6	0	0	0	0 %
11.4.8	2.4	0	0	0	0 %
11.4.9	2.6	0	0	0	0 %
11.9.5	15.3	0	0	0	0 %
Regulated Vegetation – Of Concern Regional Ecosystem					
11.3.3c	6.9	4.81 ha of 11.3.4	22.79 ha of 11.3.4	0	100 %
11.3.4	31	0	24.64	0	19.87 %
Regulated Vegetation – Regional Ecosystems within the Defined Distance of a Vegetation Management Watercourse					
11.3.1	1.1	4.4	0	0	100 %
11.9.3	2.4	0	0	6.35	66.14 %
Protected Wildlife Habitat					
<i>Solanum adenophorum</i>	0.2	0.8	0	0	100 %
Connectivity					
Connectivity	225.6 (remnant)	0	7.8 (non-remnant)	0	3.46 %

In recognition that the offset areas would only partly offset impacts from a second stage of the Project, Whitehaven WS would submit an Offset Management Strategy for the second stage to the Commonwealth Department of Climate Change, Energy, the Environment and Water for approval. For MSES, a Notice of Election for the second stage would be prepared and submitted to the DES.

A7.6 CONCLUSION

This document provides a strategy, via three offset areas, that would sufficiently offset the significant residual impacts from Stage 1 on relevant MNES, namely the Natural Grasslands TEC and habitat for the Ornamental Snake, Squatter Pigeon (southern subspecies), Koala (combined populations of Queensland, NSW and the ACT) and Greater Glider. The future quality of the MNES habitat in the offset areas would be increased over time through the implementation of management measures. A desktop review has also been undertaken of available properties within the region, which demonstrates that impacts to MNES associated with Stages 2 and 3 can be offset with land currently available within the region.

Separately, an approach for providing offsets for MSES for Stage 1 is described in this document, which is likely to include part of one or more of the offset areas identified for MNES. Accordingly, a Notice of Election would be prepared and submitted to DES prior to the commencement of each stage. The notification would identify the intended offset delivery approach, and whether the offset is to be delivered as a:

- proponent-driven offset (i.e. a traditional land-based offset);
- financial settlement offset; or
- combination of proponent-driven offset and financial settlement offset.

Whitehaven WS would enter into an agreed delivery arrangement with the DES to offset impacts on MSES.

A7.7 REFERENCES

- Department of Environment and Science (2014) *Significant Residual Impact Guidelines*.
- Department of Environment and Science (2020) *Guide to Determining Terrestrial Habitat Quality*. Version 1.3. February 2020.
- Department of Environment and Science (2021) *Queensland Environmental Offsets Policy (Version 1.11)*.
- Department of Sustainability, Environment, Water, Population and Communities (2012a) *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*.
- Department of Sustainability, Environment, Water, Population and Communities (2012b) *Offsets Assessment Guide*.
- Department of the Environment (2014) *Environmental Management Plan Guidelines*.
- Department of the Environment (2015) *Threat Abatement Plan for Predation by Feral Cats*.
- Department of the Environment and Energy (2016) *Threat Abatement Plan for Competition and Land Degradation by Rabbits*.
- Department of the Environment and Energy (2017) *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs*.
- Department of the Environment, Water and Heritage Protection (2008) *Threat Abatement Plan for Predation by the European Red Fox*.
- E2M Pty Ltd (2021) *Terrestrial Ecological Assessment for the Winchester South Project*. Prepared for Whitehaven WS Pty Ltd.
- Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F., Addicott, E.P. and Appelman, C.N. (2022) *Methodology for Surveying and Mapping Regional Ecosystems and Vegetation Communities in Queensland. Version 6.0*. Queensland Herbarium, Queensland Department of Environment and Science.

APPENDIX A. WINCHESTER SOUTH - STAGE 1 OFFSET AREA ASSESSMENT



Winchester South - Stage 1 Offset Area Assessment



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4	25/05/2022	Updated	LW	Brad Dreis	
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Appendices

Appendix A Habitat Quality Data



Executive Summary

Whitehaven WS Pty Ltd (Whitehaven WS), a wholly owned subsidiary of Whitehaven Coal Limited, is the proponent for the proposed Winchester South Project (the Project), an open cut coal mine located within the Bowen Basin, approximately 30 kilometres (km) south-east of Moranbah, Queensland.

An ecological assessment was prepared for the Project by E2M Pty Ltd (E2M, 2021) that concluded a residual impact, for which an offset is required, for the following Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Poplar Box Grassy Woodland on Alluvial Plains Threatened Ecological Community
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin Threatened Ecological Community
- ornamental snake (*Denisonia maculata*) (Vulnerable under the EPBC Act)
- koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) (Vulnerable under the EPBC Act)
- greater glider (*Petauroides volans volans*) (Vulnerable under the EPBC Act); and
- squatter pigeon (southern subspecies) (*Geophaps scripta scripta*) (Vulnerable under the EPBC Act).

Whitehaven WS proposes to offset the residual impacts to the above mentioned MNES in stages over the life of the Project, and three indicative stages have been nominated. The clearance associated with Stage 1 footprint has been quantified and this will represent the clearance limit for Stage 1. The actual location of Stage 1 clearance may vary but will not exceed the clearance limit. Subsequent stages may change depending on the progression of the mine.

To offset the residual impacts on MNES from Stage 1 of the Project, Whitehaven WS proposes to conserve and manage three separate offset areas, herein referred to as the Wynette Offset Area, Ellensfield Offset Area, and Inderi Offset Area (collectively referred to as the Offset Areas).

This document provides an assessment of the Offset Areas against the impacts in Stage 1 of the Project to determine if the relevant offset requirements have been met and are consistent with requirements of the *EPBC Act Environmental Offsets Policy*, including the *EPBC Act Offsets Assessments Guide*.

A baseline assessment was undertaken by E2M (E2M, 2022a, 2022b) to determine the ecological presented values within the Offset Areas and their surrounds. The baseline assessment included a desktop assessment using relevant databases, mapping, aerial imagery and published literature to identify the potentially present ecological values, followed by field surveys to confirm the presence, extent and condition of target ecological values relevant to Stage 1 of the Project.

This assessment concludes that the Offset Areas would sufficiently offset the impacts from Stage 1 of the Project on the relevant MNES listed above and partly offset impacts from a second stage of the Project. The future quality of the MNES habitat identified in the Offset Areas would be increased over time through implementation of management measures relevant to each MNES. The Offset Areas would also sufficiently offset the impacts from Stage 1 of the Project on the relevant Matters of State Environmental Significance (MSES) including regulated vegetation and connectivity, as well as also partly offset impacts from a second stage of the Project.



Definitions

Term	Definition
Non-remnant vegetation	All vegetation that is not mapped as remnant vegetation. May include regrowth, heavily thinned or logged and significantly disturbed vegetation that fails to meet the structural and/ or floristic characteristics of remnant vegetation. It also includes urban and cropping land (Neldner et al., 2022).
Project area	This area is defined as the area that would be impacted by the mine site, mine infrastructure, water pipeline, electricity transmission line, access road, and rail spur.
Regional Ecosystem	A vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil (Neldner et al., 2022). Regional Ecosystems are described in the Regional Ecosystem Description Database, produced by the Queensland Herbarium.
Regrowth Vegetation	Is non-remnant vegetation that has a significant woody component but fails to meet the structural and/or floristic characteristics of remnant vegetation. Includes vegetation that has regrown after clearing or been heavily thinned or logged (Neldner et al., 2022).
Regulated Vegetation	Vegetation that is mapped within the regulated vegetation management map produced by Department of Resources (formerly Department of Natural Resources, Mines and Energy). The <i>Queensland Vegetation Management Act 1999</i> is applicable to regulated vegetation.
Remnant vegetation	A regional ecosystem that has not undergone recent clearing. It is defined under the <i>Queensland Vegetation Management Act 1999</i> as: (b) forming the predominant canopy of the vegetation— (i) covering more than 50% of the undisturbed predominant canopy; and (ii) averaging more than 70% of the vegetation’s undisturbed height; and (iii) composed of species characteristic of the vegetation’s undisturbed predominant canopy.
Suitable habitat	A species preferred environment required to sustain a viable population. Suitable habitat may include breeding, foraging and shelter resources for fauna or preferred environmental conditions of flora
Threatened species	A threatened species is any plant or animal species that is at risk of extinction. Species listed as extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) or conservation dependent (CD) under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> or extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) under the <i>Queensland Nature Conservation Act 1992</i> .
Vegetation community	An area of vegetation which is relatively uniform with respect to structure and floristic composition(Neldner et al., 2022).
Winchester South Project or ‘the Project’	Winchester South Project is a metallurgical open cut coal mine and associated infrastructure within the Bowen Basin, located approximately 30 kilometres (km) south-east of Moranbah, within the Isaac Regional Council Local Government Area (LGA).



Abbreviations

Abbreviation	Description
%	Percent
API	Aerial Photography Interpretation
BoM	Bureau of Meteorology
CHPP	Coal Handling and Preparation Plant
Cth	Commonwealth
DAWE	Former Commonwealth Government Department of Agriculture, Water and the Environment (now Department of Climate Change, Energy, the Environment and Water)
DCCEEW	Commonwealth Government Department of Climate Change, Energy, the Environment and Water
DEE	Former Commonwealth Government Department of the Environment and Energy
DES	Queensland Department of Environment and Science
DEWHA	Former Commonwealth Government Department of the Environment, Water, Heritage and the Arts
DoE	Former Commonwealth Government Department of the Environment
DSEWPac	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now Department of Agriculture, Water and the Environment)
E2M	E2M Pty Ltd
EIS	Environmental Impact Statement
EOP	<i>EPBC Act Environmental Offsets Policy 2012</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
ETL	Electricity Transmission Line
GDE	Groundwater Dependent Ecosystem
ha	Hectare
km	Kilometres
LGA	Local Government Area
MIA	Mine Infrastructure Area
MLA	Mining Lease Application
mm	Millimetres
MNES	Matters of National Environmental Significance



Abbreviation	Description
MSES	Matters of State Environmental Significance
NC Act	Queensland <i>Nature Conservation Act 1992</i>
Qld	Queensland
RE	Regional Ecosystem
SAT	Spot Assessment Technique
SPRAT	Commonwealth Species Profile and Threats Database
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
VM Act	Queensland <i>Vegetation Management Act 1999</i>
Whitehaven WS	Whitehaven WS Pty Ltd (proponent) of the Winchester South Project



1 Introduction

This Stage 1 Offset Area Assessment Report has been prepared by E2M Pty Ltd (E2M) for Whitehaven WS Pty Ltd (Whitehaven WS), a wholly owned subsidiary of Whitehaven Coal Limited, and forms part of the Environmental Impact Statement (EIS) for the Winchester South Project (the Project).

1.1 Project overview

Whitehaven WS propose to develop the Winchester South Project (the Project). The Project is a coal mine located in the Bowen Basin approximately 30 kilometres (km) south-east of Moranbah (Figure 1). The Project involves the development of an open cut coal mine in an existing mining precinct for export of coal products. The Project would include the construction and operation of a mine infrastructure area (MIA), including a Coal Handling and Preparation Plant (CHPP), train load-out facility and rail spur used for the handling, processing and transport of coal. An infrastructure corridor would also form part of the Project, containing a raw water supply pipeline connecting to the Eungella pipeline network, an electricity transmission line (ETL) and a mine access road.

A comprehensive terrestrial ecology assessment was conducted by E2M (2021) within the Project area and the broader Study Area which encompasses the Mining Lease Application (MLA) Boundary (Figure 2). The *Winchester South Terrestrial Ecology Assessment* (E2M, 2021), prepared as part of the Winchester South Project EIS, identified and evaluated the Matters of National Environmental Significance (MNES) and the Matters of State Environmental Significance (MSES) likely to be adversely impacted by the Project.

The Terrestrial Ecology Assessment (E2M, 2021) concluded that the development of the Project would have a residual impact on the following MNES listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- two threatened ecological communities (TEC):
 - Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin (Natural Grasslands TEC); and
 - Poplar Box Grassy Woodland on Alluvial Plains (Poplar Box TEC)
- four threatened species and associated habitat:
 - ornamental snake (*Denisonia maculata*) (Vulnerable under the EPBC Act)
 - koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) (Endangered under the EPBC Act¹). Note that the koala has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral
 - greater glider (*Petauroides volans*) (Endangered under the EPBC Act^{1,2}). Note that the greater glider has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral; and
 - squatter pigeon (southern subspecies) (*Geophaps scripta scripta*) (Vulnerable under the EPBC Act).

¹ Listed as 'Vulnerable' under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as 'Vulnerable' not 'Endangered' (refer section 158A of the EPBC Act).

² Listed as 'Vulnerable' under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as 'Vulnerable' not 'Endangered' (refer section 158A of the EPBC Act).



Whitehaven WS proposes to offset the residual impacts to the abovementioned MNES in stages over the life of the Project, and three indicative stages have been nominated (Figure 3). The clearance associated with Stage 1 footprint has been quantified and this will represent the clearance limit for Stage 1. The actual location of Stage 1 clearance may vary but will not exceed the clearance limit. Subsequent stages may change depending on the progression of the mine. Within the indicative surface disturbance extent there is land without MNES or MSES (Figure 3). This land does not contain any matters of significance and therefore does not require offsetting to allow for disturbance. During the life of the Project, Whitehaven WS will be able to progressively disturbance this land without MNES or MSES.

Impacts predicted to occur by E2M (2021) within Stage 1 of the Project relevant to each MNES are summarised in Table 1 and depicted in Figure 4 to Figure 8.

Table 1: Stage 1 Significant Residual Impacts on MNES

MNES		Stage 1 Impact Total (ha)
Natural Grasslands TEC		80.9
ornamental snake (<i>Denisonia maculata</i>)		50
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	breeding and foraging habitat	53.8
koala (<i>Phascolarctos cinereus</i>)		78.2
greater glider (<i>Petauroides volans</i>)		42.1

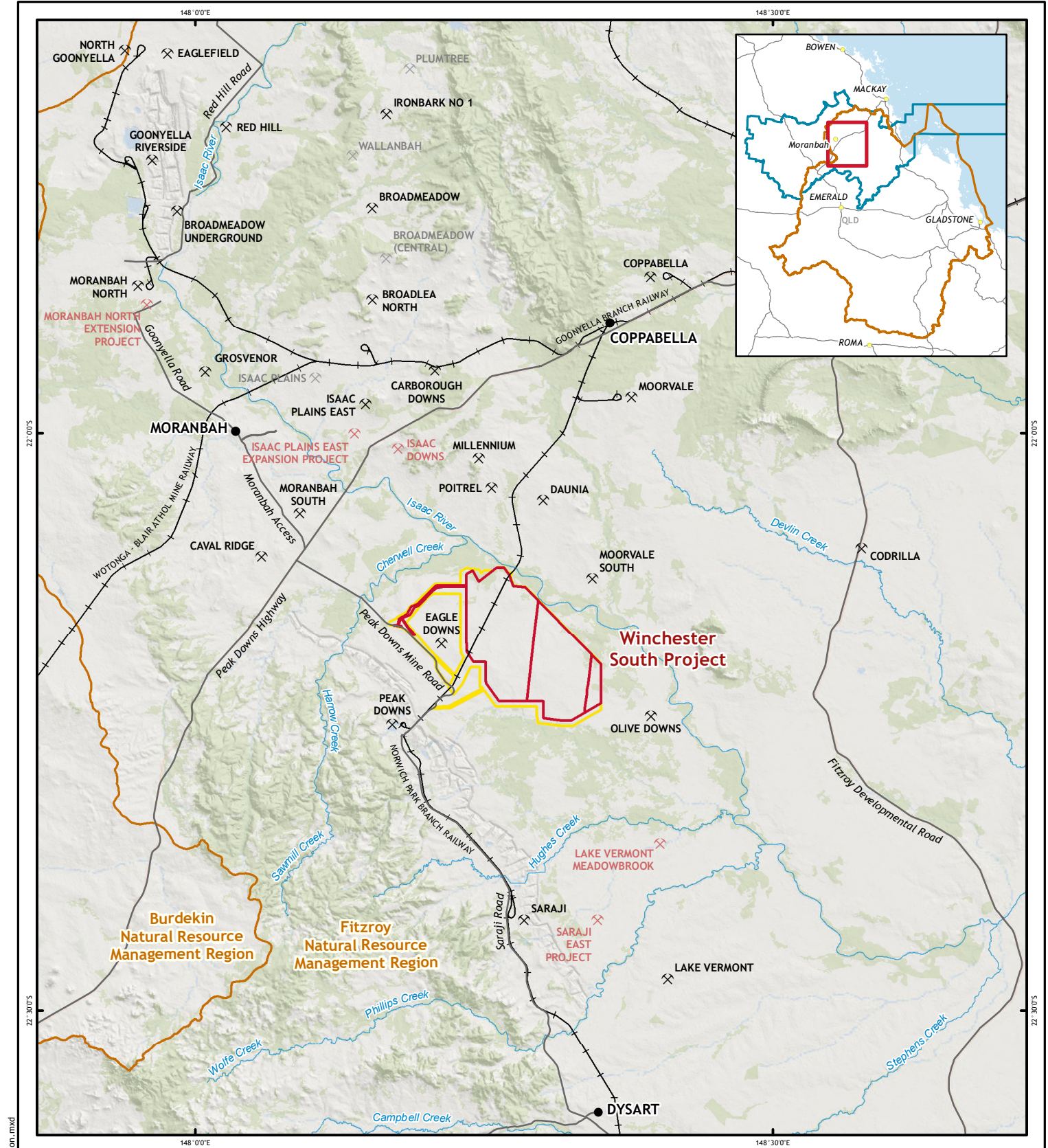
To offset the residual impacts on MNES from Stage 1 of the Project, Whitehaven WS proposes to conserve and manage three separate offset areas, herein referred to as the Wynette Offset Area, Ellensfield Offset Area, and Inderi Offset Area (collectively referred to as the Offset Areas) (Figure 9).

An overview of the associated Project impacts to MSES for Stage 1 of the Project is also provided within this report.

1.2 Objective

The objective of this assessment is to define the proposed offset for Stage 1 of the Project in relation to MNES. This assessment provides details of how the Offset Areas meet the requirements of the *EPBC Act Environmental Offsets Policy 2012* (EOP) (Department of Sustainability, Environment, Water, Population and Communities (DSEWPac), 2012a), including the *EPBC Act Offsets Assessments Guide* (DSEWPac, 2012a).





Legend

- Road
- Watercourse
- Railways
- Study Area
- NRM Region
- Isaac Regional Council
- Winchester South Mining Lease Application

Coal Resource Site

- Approved/Operating Coal Mine
- Care and Maintenance
- Proposed Coal Mine



Scale 1:500,000 (A4)



Coordinate System: GCS GDA 1994

Notes:
Coal Resource Sites: © Whitehaven 2020
Topographic: © Geoscience Australia 2019

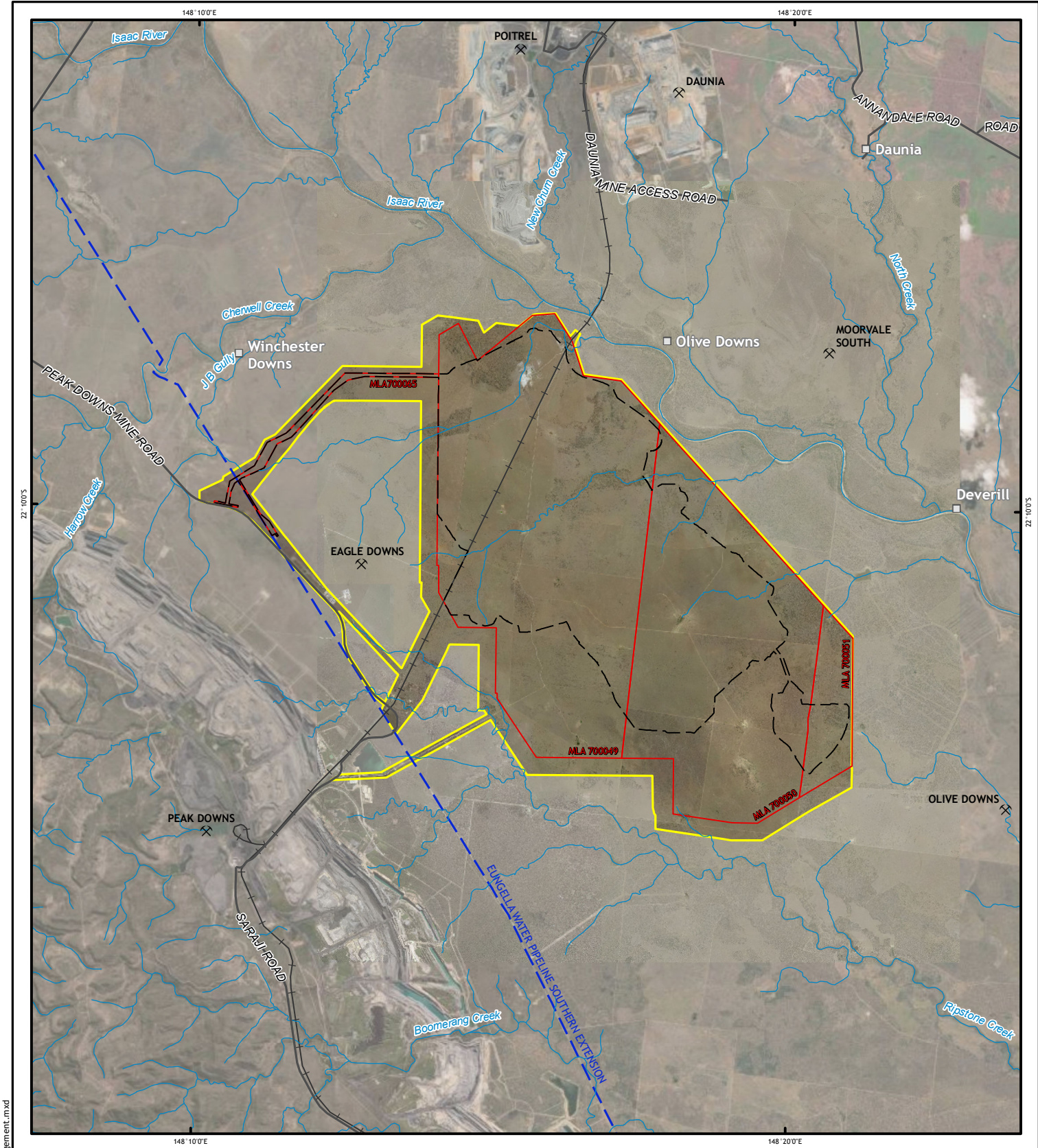
FIGURE 1: REGIONAL CONTEXT FOR THE WINCHESTER SOUTH PROJECT

Stage 1 Offset Area Assessment Report WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6



5	Issued for Use	DL	BD	20/06/2022
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Rev	Description	Drawn	Approved	Date



Legend

- Homestead
- Water Pipeline
- Indicative Surface Disturbance Extent
- Railway
- Study Area
- Mining Lease Application Boundary
- Road
- Watercourse

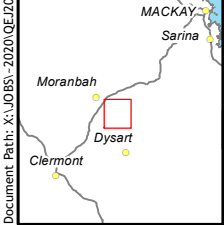


Scale 1:150,000 (A4)

0 2 4 6 8

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © ESRI 2019, Whitehaven 2019
Cadastre: © DNRME 2018
Coal Resource Site: © Whitehaven 2020
Watercourse: © Geoscience Australia 2018
Homesteads: © DNRME 2018

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6	Issued for Use	DL	BD	6/10/2022
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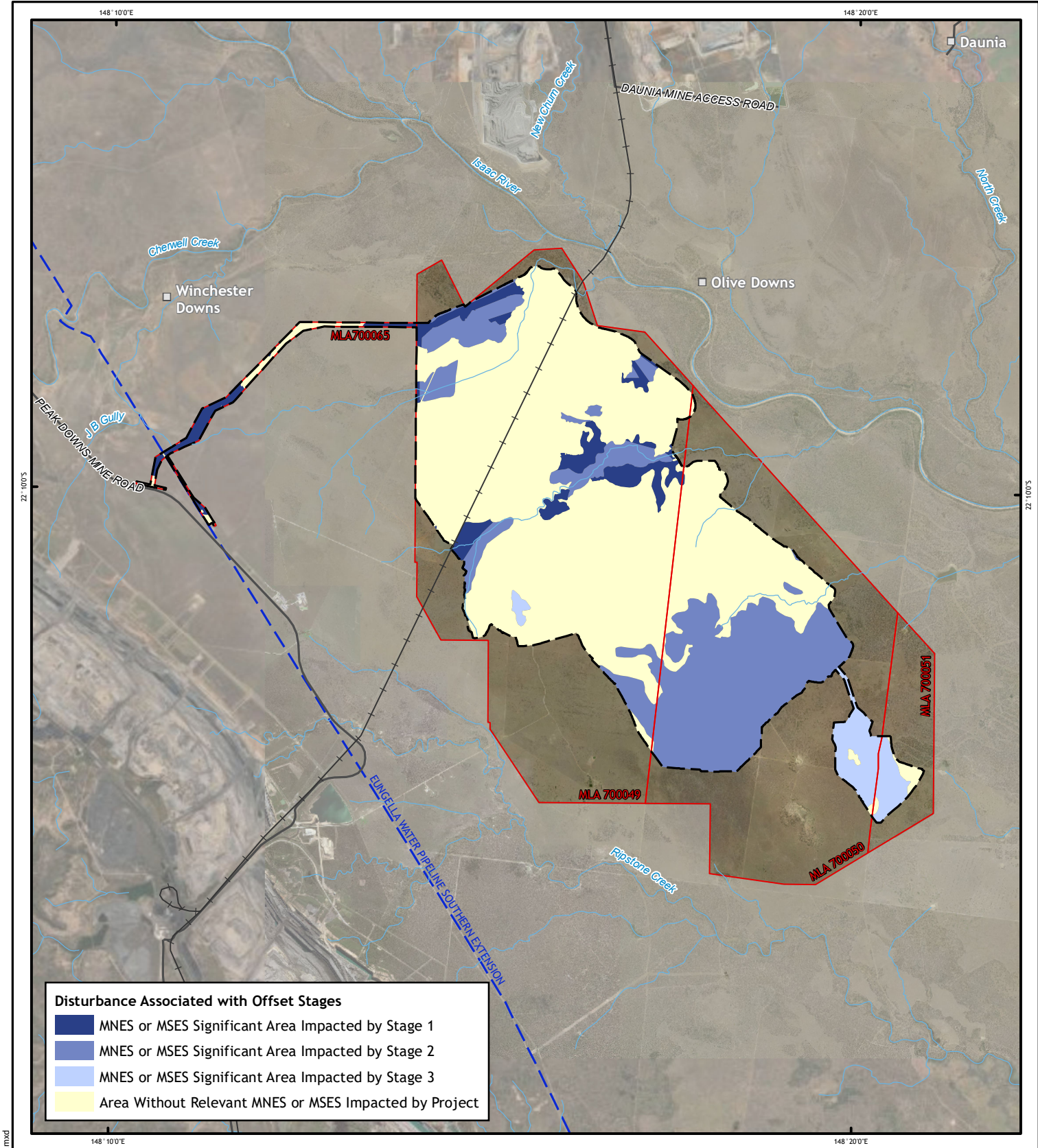


FIGURE 2: WINCHESTER SOUTH PROJECT AND STUDY AREAS

Stage 1 Offset Area Assessment Report

WHITEHAVEN COAL

Map Number	Job Number	Rev
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Disturbance Associated with Offset Stages

- MNES or MSES Significant Area Impacted by Stage 1
- MNES or MSES Significant Area Impacted by Stage 2
- MNES or MSES Significant Area Impacted by Stage 3
- Area Without Relevant MNES or MSES Impacted by Project

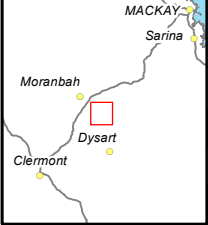
Legend

- Homesteads
- Railways
- Road
- Watercourse
- Water Pipeline
- Mining Lease
- Application Boundary
- Indicative Surface
- Disturbance Extent

Scale 1:120,000 (A4)

0 2 4 6 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
 Aerial Imagery: © ESRI 2019, Whitehaven 2019
 Cadastre: © DNRME 2018
 Watercourse: © Geoscience Australia 2018
 Homesteads: © DNRME 2018
 Mining Lease: © DNRME 2019

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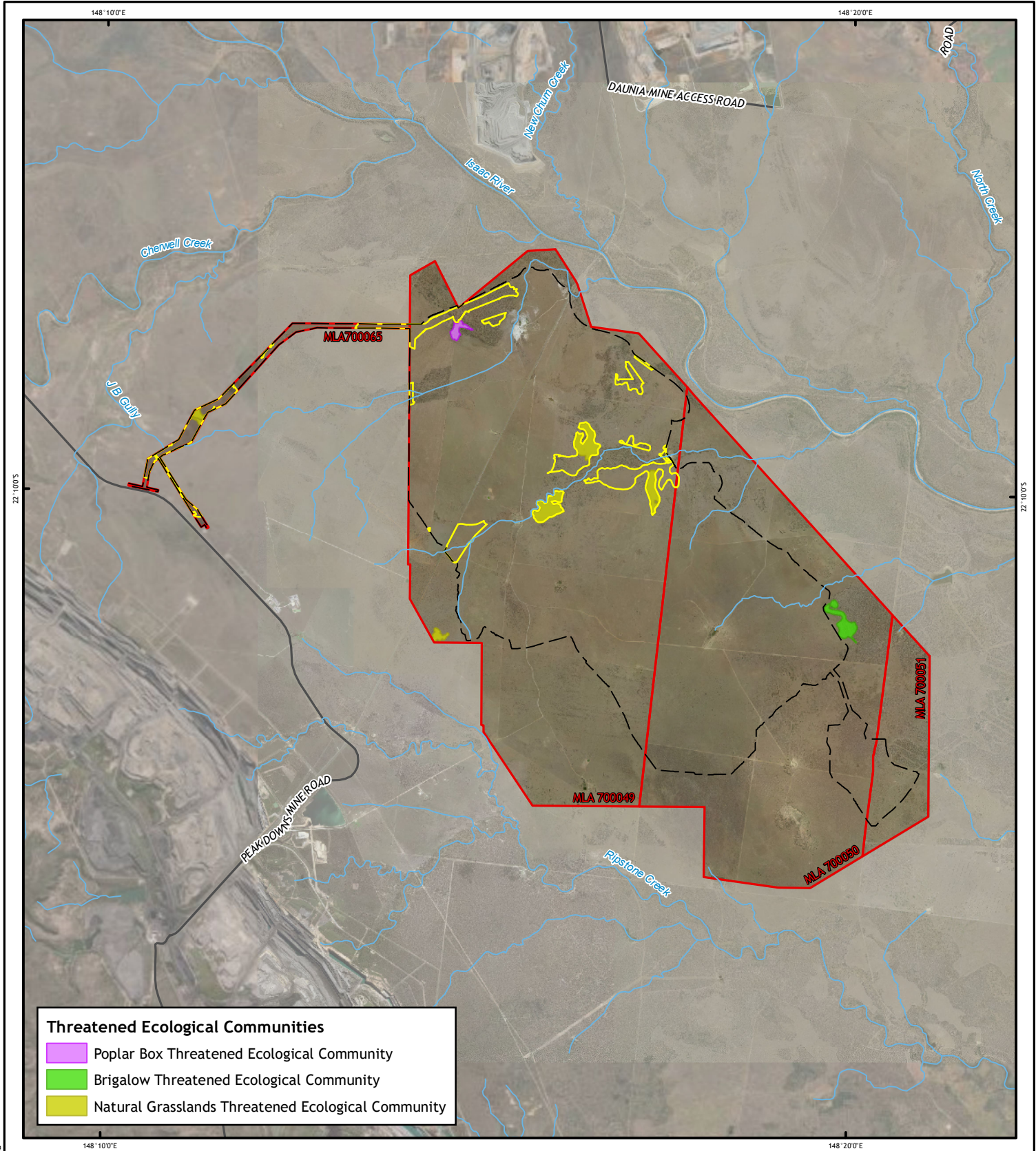


FIGURE 3: STAGES OVER THE LIFE OF THE PROJECT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

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Threatened Ecological Communities

- Poplar Box Threatened Ecological Community
- Brigalow Threatened Ecological Community
- Natural Grasslands Threatened Ecological Community

Legend

- Watercourse and Drainage Feature
- Road
- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- MNES or MSES Significant Area Impacted by Stage 1



Scale 1:120,000 (A4)

0 1 2 3 4
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

Notes:
Aerial Imagery: © DNRME 2018, Whitehaven 2019
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastre: © DNRME 2019
TEC: © EZM 2019

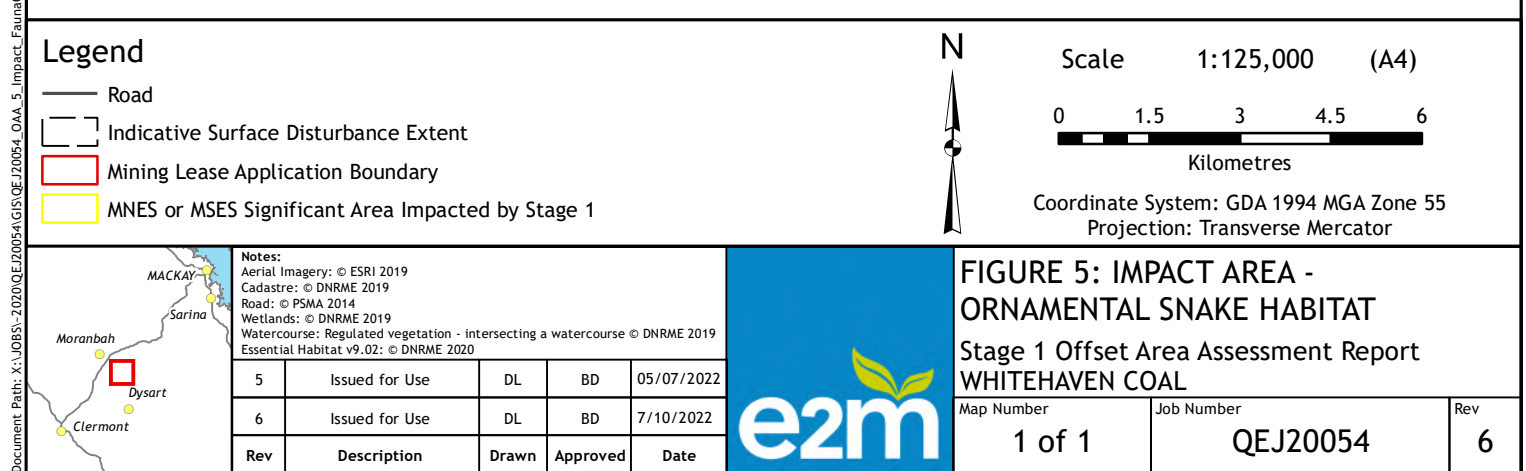
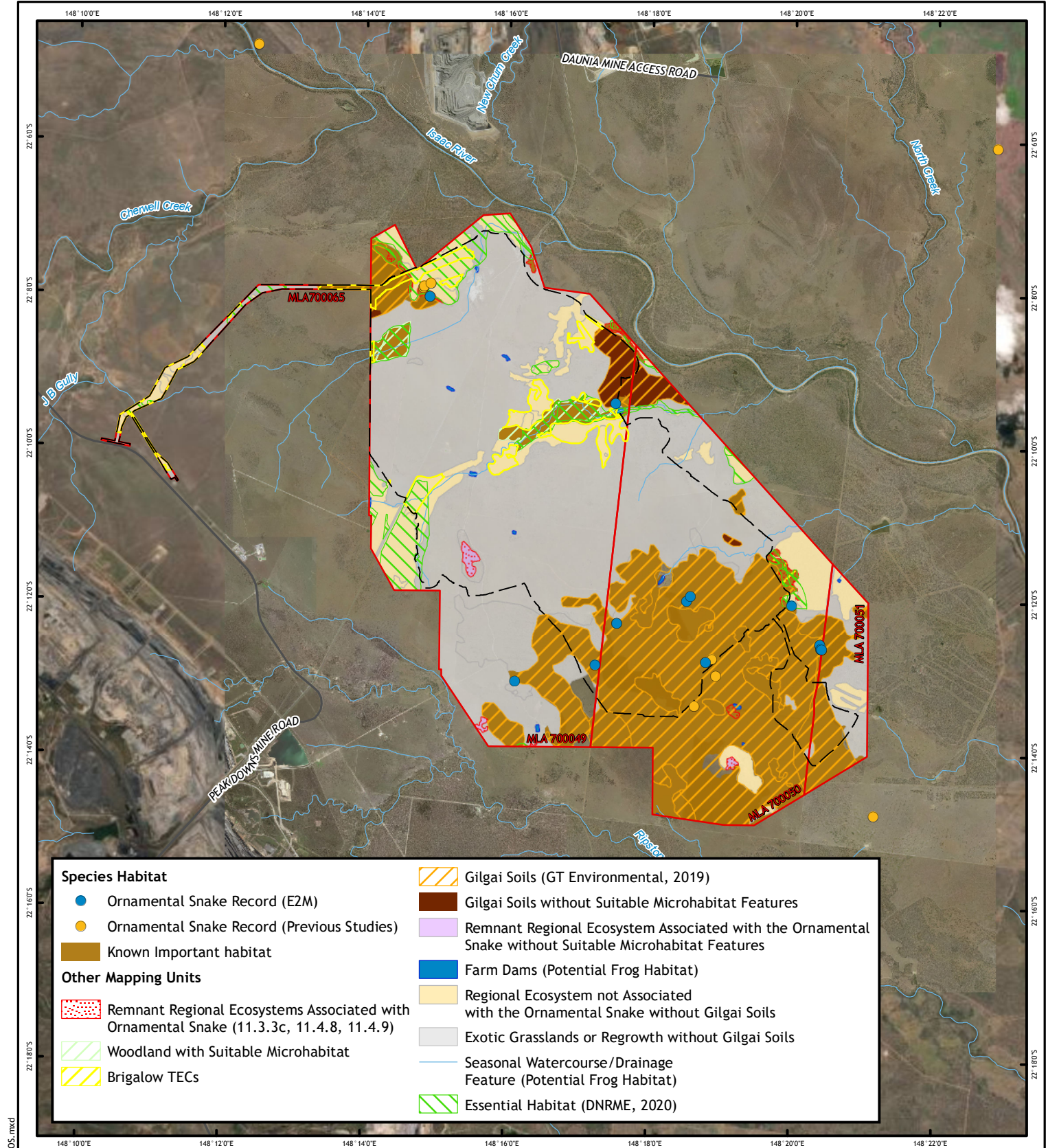
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6	Issued for Use	DL	BD	07/10/2022
Rev	Description	Drawn	Approved	Date

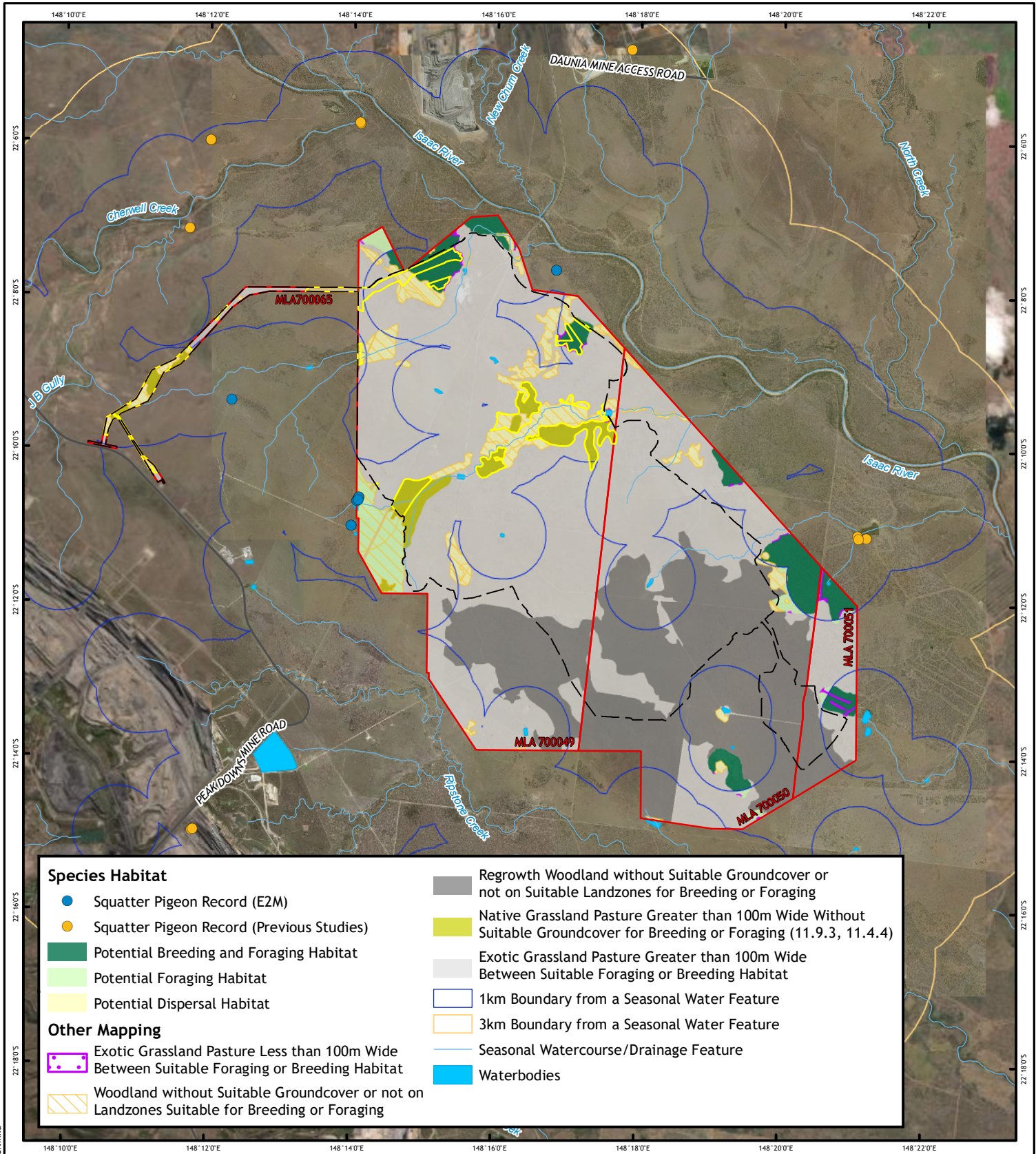


FIGURE 4: IMPACT AREA - THREATENED ECOLOGICAL COMMUNITIES

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6





Legend

- Road
- Indicative Surface Disturbance Extent
- Mining Lease Application Boundary
- MNES or MSES Significant Area Impacted by Stage 1



Scale 1:125,000 (A4)

0 1.5 3 4.5 6

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © ESRI 2019
Cadastre: © DNRME 2019
Road: © PSMA 2014
Watercourse: © DNRME Queensland Wetland Data Version 4.0 2013

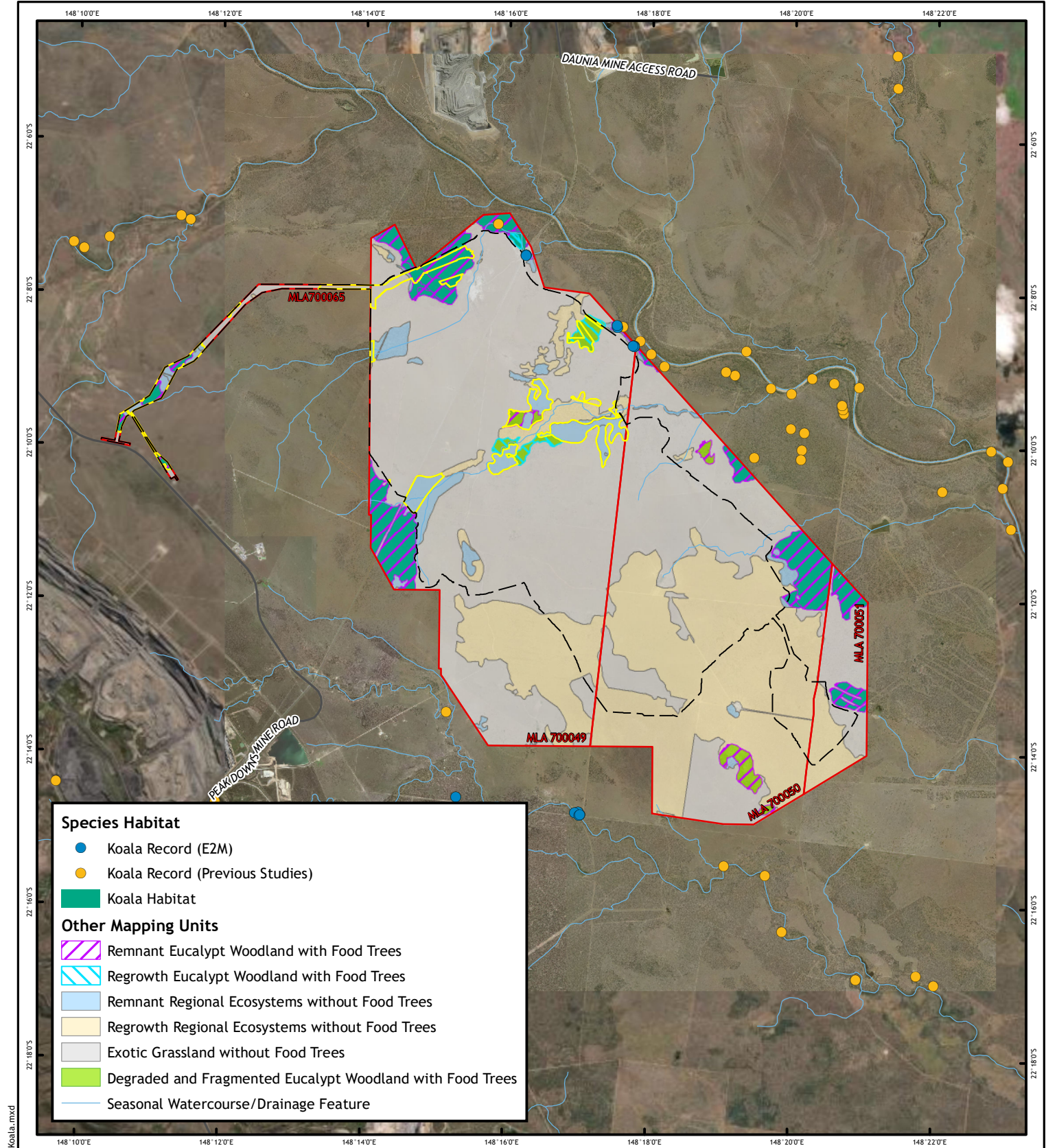
5	Issued for Use	DL	BD	21/06/2022
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FIGURE 6: IMPACT AREA - SQUATTER PIGEON HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6



Legend

- Road
- Indicative Surface Disturbance Extent
- Mining Lease Application Boundary
- MNES or MSES Significant Area Impacted by Stage 1

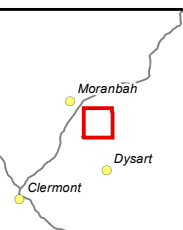


Scale 1:125,000 (A4)

0 1.5 3 4.5 6

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © ESRI 2019, Whitehaven 2019
Watercourse: Regulated vegetation - intersecting a watercourse © DNRME 2019
Cadastre: © DNRME 2019
Road: © PSMA 2014

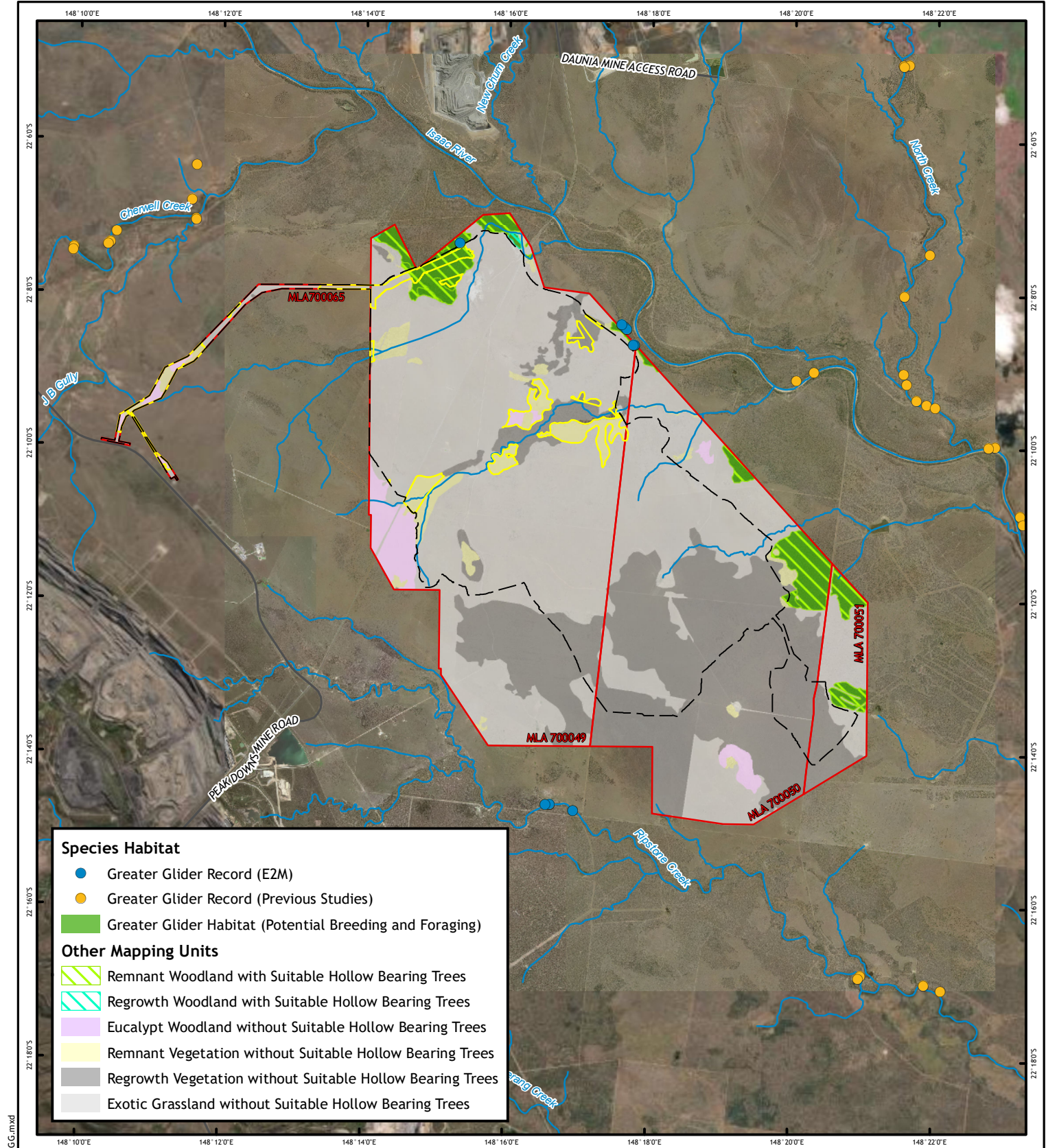
5	Issued for Use	DL	BD	21/06/2022
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Rev	Description	Drawn	Approved	Date



FIGURE 7: IMPACT AREA - KOALA HABITAT

Stage 1 Offset Area Assessment Report
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1 of 1	QEJ20054	6



Species Habitat

- Greater Glider Record (E2M)
- Greater Glider Record (Previous Studies)
- Greater Glider Habitat (Potential Breeding and Foraging)

Other Mapping Units

- Remnant Woodland with Suitable Hollow Bearing Trees
- Regrowth Woodland with Suitable Hollow Bearing Trees
- Eucalypt Woodland without Suitable Hollow Bearing Trees
- Remnant Vegetation without Suitable Hollow Bearing Trees
- Regrowth Vegetation without Suitable Hollow Bearing Trees
- Exotic Grassland without Suitable Hollow Bearing Trees

Legend

- Watercourse and Drainage Feature
- Road
- Indicative Surface Disturbance Extent
- Mining Lease Application Boundary
- MNES or MSES Significant Area Impacted by Stage 1



Scale 1:125,000 (A4)

0 1.5 3 4.5 6

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

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Notes:
Aerial Imagery: © ESRI 2019
Watercourse: Regulated vegetation - intersecting a watercourse © DNRME 2019
Cadastre: © DNRME 2019
Road: © PSMA 2014

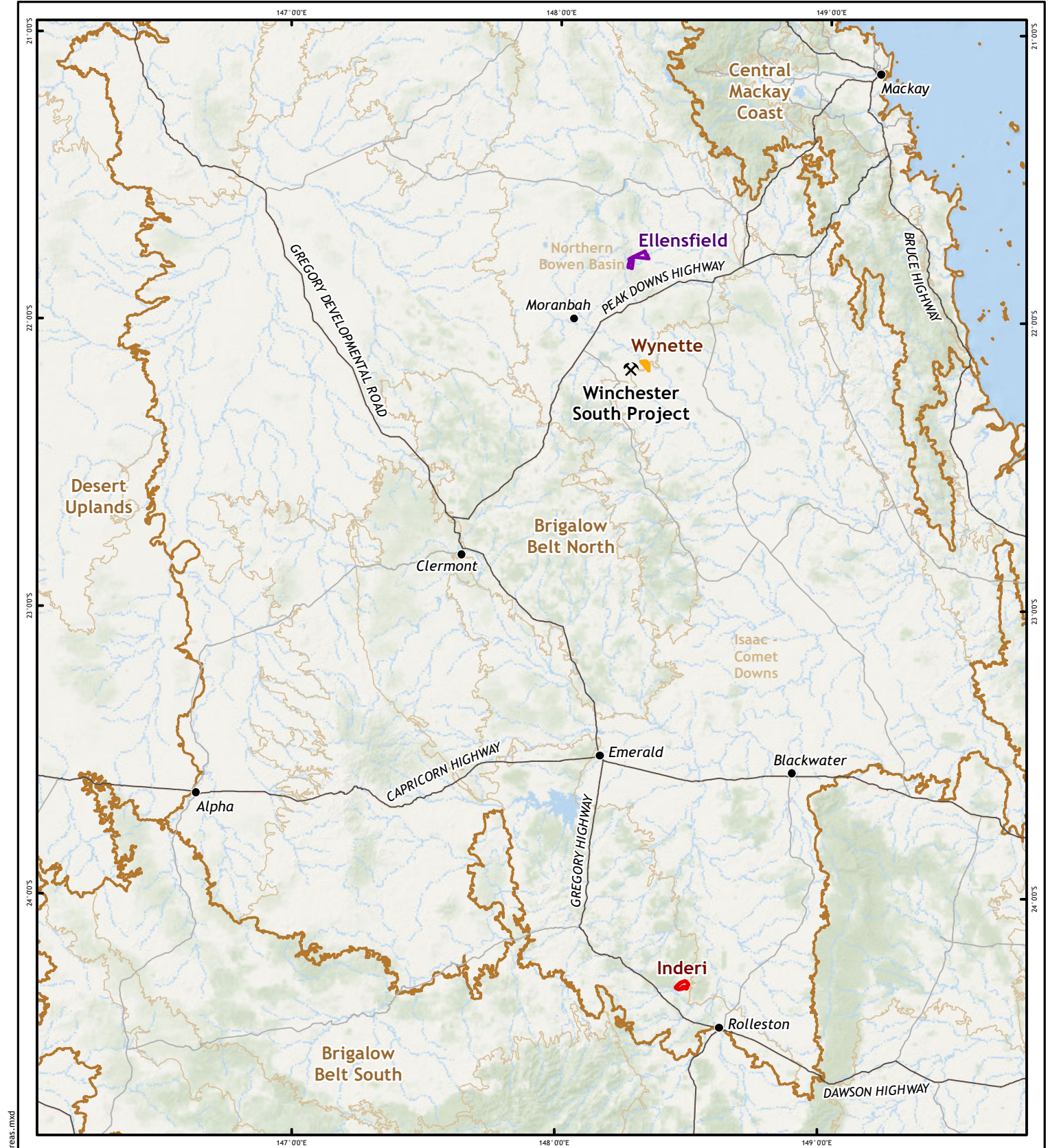
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6	Issued for Use	DL	BD	7/10/2022
Rev	Description	Drawn	Approved	Date



FIGURE 8: IMPACT AREA - GREATER GLIDER HABITAT

Stage 1 Offset Area Assessment Report
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1 of 1	QEJ20054	6



Legend

- Town
- ⌵ Coal Resource Site
- Major Road
- Bioregion (IBRA v7)
- Biogeographic Subregions
- Wynette Offset Area
- Inderi Offset Area
- Ellensfield Offset Area



Scale 1:2,000,000 (A4)

0 20 40 60 80
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
MDL: © DNRME 2018
Roads: © DNRME 2019

5	Issued for Use	DL	BD	05/07/2022
6	Issued for Use	DL	BD	7/10/2022
Rev	Description	Drawn	Approved	Date



FIGURE 9: OFFSET AREAS OVERVIEW

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

1.3 Relevant Offset Policies and Guides

1.3.1 Commonwealth Environmental Offsets Policy 2012

The EOP outlines the Australian Government's approach to environmental offsets under the EPBC Act. The EOP applies to all protected matters under the EPBC Act for which offsetting is proposed, appropriate and feasible. The EOP has five key aims:

1. Ensure the efficient, effective, timely, transparent, proportionate, scientifically robust, and reasonable use of offsets under the EPBC Act
2. Provide proponents, the community and other stakeholders with greater certainty and guidance on how offsets are determined and when they may be considered under the EPBC Act
3. Deliver improved environmental outcomes by consistently applying the policy
4. Outline the appropriate nature and scale of offsets and how they are determined; and
5. Provide guidance on acceptable delivery mechanisms for offsets.

A suitable offset delivers an overall conservation outcome and improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action.

1.3.2 Commonwealth Offsets Assessment Guide

The EPBC Act *Offsets Assessment Guide* (DSEWPaC, 2012a), which accompanies the EOP, has been developed to give effect to the EOP's requirements, utilising a balance sheet approach to quantify impacts and offsets and ultimately assess the suitability of offset proposals.



2 Offset Areas

The Offset Areas consist of portions of three individual properties (Figure 9):

- Wynette Property (Lot 4 on Plan CNS15)
- Ellensfield Property (Lot 13 on Plan SP178466); and
- Inderi Property (Lot 55 on Plan DSN318).

The Wynette property is entirely owned by Whitehaven WS. Whitehaven WS has reached an agreement with the current registered landholders of the Ellensfield Property and Inderi Property to use the land as offsets.

2.1 Baseline Report Overview

E2M conducted ecological surveys within study areas on each property mentioned above (E2M, 2021). The terrestrial ecological values of each of the three properties were initially evaluated through a desktop assessment and validated through a series of field assessments (E2M, 2021) conducted in accordance with the following prescribed State and Commonwealth guidelines:

- Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner et al., 2022)
- Conservation Advice criteria for each TEC (Department of the Environment [DoE], 2013; Department of the Environment and Energy [DEE], 2019; Department of the Environment, Water, Heritage and the Arts [DEWHA], 2008)
- Random Meander Technique (Cropper, 1993)
- *Flora Survey Guidelines - Protected Plants (NC Act 1992)* (DES, 2020)
- *Regional Ecosystem Technical Descriptions for the Brigalow Belt* (DES, 2018).
- *Guide to Determining Terrestrial Habitat Quality (Version 1.3): Methods for Assessing Habitat Quality under the Queensland Environmental Offsets Policy* (DES, 2021)
- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al., 2018)
- *Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles* (Cth) (DSEWPAC, 2011)
- *EPBC Act referral guidelines for the vulnerable koala* (Cth) (DoE, 2014a)
- *Survey Guidelines for Australia's Threatened Mammals* (Cth) (DSEWPAC, 2011b)
- *Survey Guidelines for Australia's Threatened Reptiles* (Cth) (DSEWPAC, 2011c)
- *Survey Guidelines for Australia's Threatened Birds* (Cth) (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010)
- Species Profile and Threats Database (SPRAT) (Cth) (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2022b),
- Species Approved Conservation Advice (Cth) (Department of the Environment, 2014, Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC), 2012, Threatened Species Scientific Committee (TSSC, 2009); TSSC, 2012; TSSC, 2015; DCCEEW, 2022)
- Species National Recovery Plans (Cth) (Department of Agriculture, Water and the Environment, 2021a)



- *Map of Queensland Wetland Environmental Values* (DES, 2021)
- Koala (*Phascolarctos cinereus*) - Spot Assessment Technique (SAT) (Phillips & Callaghan, 2011); and
- WildNet Wildlife Records (DES, 2018b).

2.1.1 Desktop Assessment

The desktop assessment consolidated information from relevant databases, mapping, aerial imagery, and published literature to produce an initial characterisation of the ecological values of the Offset Areas and surrounding landscape. In part, this initial characterisation guided the survey strategy by providing information such as previously recorded threatened species, potential habitat features and mapped vegetation communities.

Preliminary vegetation mapping was initially undertaken across each of the properties through Aerial Photography Interpretation (API). API allows for accurate vegetation community mapping at a property scale and allows for the accurate delineation of heterogeneous polygons mapped by the Department of Natural Resources, Mines and Energy (DNRME) into homogenous polygons of Regional Ecosystems (REs). Based on the preliminary mapping, suitable representative sites were identified for each vegetation community to inform the field surveys. This process also identified key areas to target during the field surveys to verify the correct RE classification as well as to undertake Habitat Quality Assessments.

2.1.2 Baseline Report Field Assessment

The field surveys were conducted to identify and characterise the presence, extent and condition of the target ecological values present with a focus on the MNES and MSES impacted by Stage 1 of the Project.

Further details on the field survey method and results are provided within the following documents:

- Baseline Assessment Report for Wynette North and Inderi (E2M, 2022a); and
- Ellensfield Baseline Offset Assessment Report (E2M, 2022b).

This report summarises the methods, desktop and field survey results and habitat quality assessments detailed within these supporting reports.

2.1.2.1 Survey timing and conditions

The Wynette Study Area was surveyed between 6-12 May 2020 (dry season) and 19-23 January 2021 (wet season) by two E2M ecologists. Weather conditions during the dry season survey were dry and moderately cool, with daily temperatures ranging from 13°C to 29°C³. The area had received limited rainfall (approximately 5 mm) in the month preceding the survey and below average rainfall over the three months preceding the survey. Although limited rainfall had been received in the lead up to the field survey, reproductive material was observed on several perennial and annual grasses and forbs. Conditions during the wet season survey were also hot and dry, with daily temperatures ranging from 19°C to 35°C. The area had received approximately 239 mm of rain in the two months preceding the field survey resulting in the emergence of reproductive material as well as annual forbs and grasses in the understorey.

³ Weather data recorded at Moranbah Airport (weather station number 34035), 30 km north-west of Wynette Offset (BoM, 2020)



The Ellensfield Study Area was surveyed between 10 to 17 May 2021 by four E2M ecologists. The field survey conditions during this time were dry and warm. Daily temperatures on site during the field survey ranged between 24.4°C to 33.2°C⁴. No rainfall was received during the field survey (a total of 111 mm of rain was recorded during the three months preceding the field survey as compared to 206 mm over February, March and April).

The Inderi Study Area was surveyed between 6 - 7 May and 3 - 4 June 2020 by two E2M ecologists. Survey conditions during the first field assessment were dry and moderately cool, with daily temperatures ranging from 10°C to 27°C⁵ (Bureau of Meteorology, 2020). The Inderi Study Area had received below average rainfall over the three months preceding the survey. Weather conditions during the second field survey were also dry and cool, with daily temperatures ranging from 3°C to 21°C⁴. The area had received approximately 6 mm of rainfall since the first field survey and one month prior to the second field survey.

2.1.2.2 Regional ecosystems

Ground-truthing and validating vegetation community mapping within each Study Area was conducted in accordance with the Queensland Government's *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al., 2022). Using this methodology, a combination of Tertiary and Quaternary vegetation surveys were carried out in alignment with the Queensland Herbarium's CORVEG database.

Vegetation was characterised as:

- **Remnant vegetation** - communities that conform with the definition under the *Queensland Vegetation Management Act 1999* (VM Act) and referenced by Neldner et al. (2022). Specifically, this comprises 'vegetation, part of which forms the predominant canopy of the vegetation:
 - covering more than 50% of the undisturbed predominant canopy
 - averaging more than 70% of the vegetation's undisturbed height; and
 - composed of species characteristic of the vegetation's undisturbed predominant canopy.'
- **Non-remnant vegetation** - all vegetation that is not mapped as remnant vegetation. This includes regrowth and communities that have been historically cleared/disturbed or heavily modified (i.e. improved pastures, weed encroachment) that failed to meet the structural and/or floristic characteristics of remnant vegetation.

Heterogenous RE polygons mapped in each Study Area by DES were ground-truthed and mapped as homogenous polygons (Figure 10, Figure 11 and Figure 12).

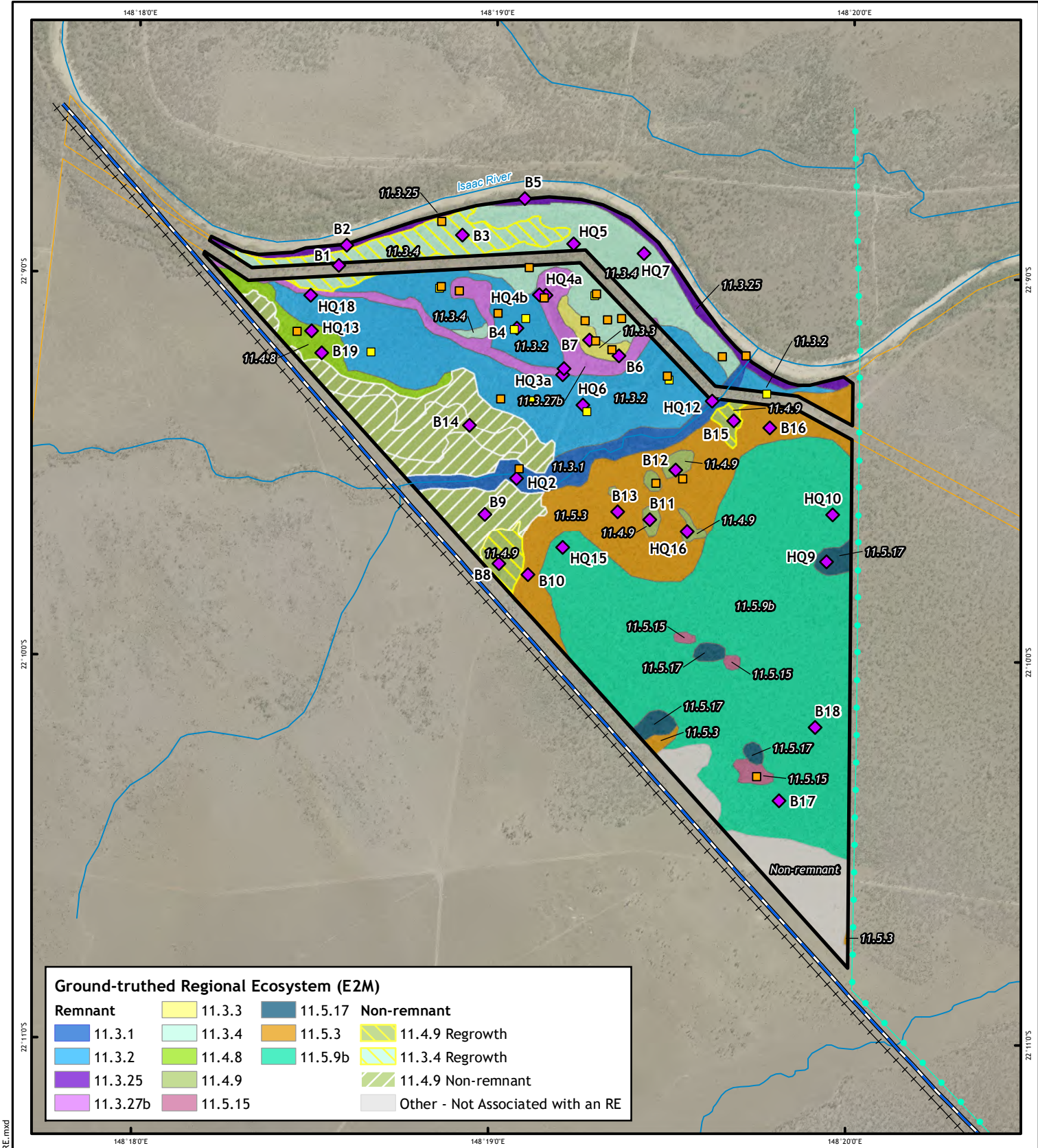
2.1.2.3 Threatened ecological communities

TEC assessments were undertaken during the field surveys within relevant vegetation communities to verify if key diagnostic characteristics and condition thresholds for EPBC Act-listed TECs were met. Specific condition criteria and characteristics used for the assessments are based on respective information provided within each 'approved listing advice' published for each TEC identified within the desktop assessment (Section 2.5).

⁴ Weather data recorded at Moranbah Airport (weather station number 034035), 30 km south-west of the Ellensfield Offset (BoM, 2020).

⁵ Weather data recorded at Rolleston Airport (weather station number 35129), 22 km south-east of Inderi Offset (BoM, 2020).





Legend

- BioCondition Site
- TEC Assessment Site
- Quaternary Site
- Seasonal Watercourse / Drainage Feature
- Wynette Property Boundary
- Wynette Offset Area
- Olive Downs Infrastructure
- Rail
- Water Pipeline
- ETL

Scale: 1:25,000 (A4)

0 0.5 1 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

FIGURE 10: WYNETTE OFFSET AREA GROUND-TRUTHED REGIONAL ECOSYSTEMS

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number: 1 of 1 Job Number: QEJ20054 Rev: 6

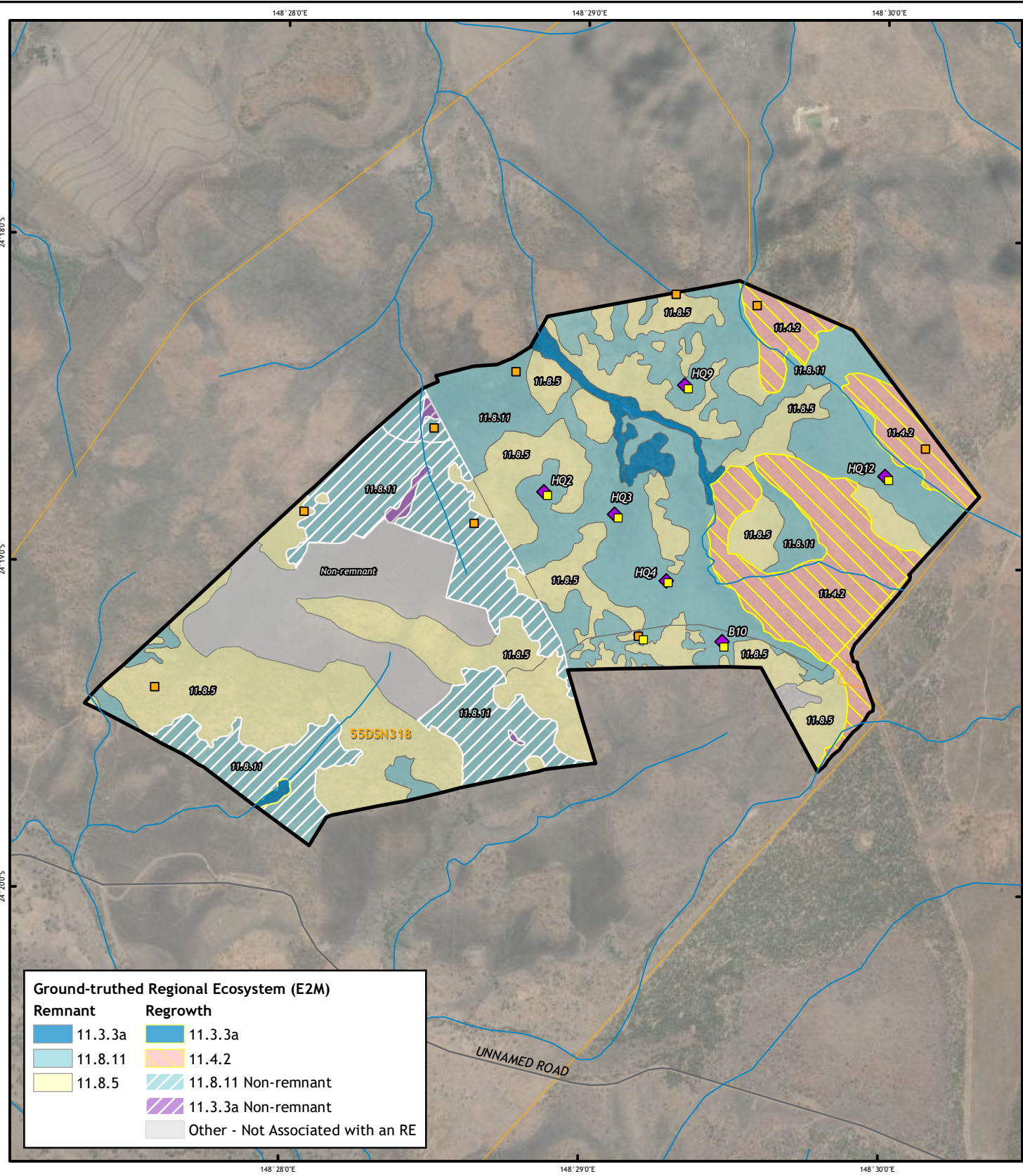
Notes:

Aerial Imagery: © DNRME 2018, Whitehaven 2019
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastral: © DNRME 2019
GTRE: © E2M 2021

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	BD	18/10/2022
5	Issued for Use	DL	BD	05/07/2022

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Document Path: X:\JOBS\2020\QEJ20054\GIS\QEJ20054_OAA_12_Inderi_GTRE.mxd



Legend

- Habitat Quality Site
- TEC Assessment Site
- Quaternary Site
- Road
- Seasonal Watercourse / Drainage Feature
- Inderi Property Boundary
- Inderi Offset Area

Scale 1:30,000 (A4)

0 0.25 0.5 0.75 1 1.25 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:

- Aerial Imagery: © ESRI 2020
- Watercourse: © Geoscience Australia 2018
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Rev	Description	Drawn	Approved	Date
5	Issued for Use	DL	BD	05/07/2022
6	Issued for Use	DL	BD	7/10/2022



FIGURE 12: INDERI OFFSET AREA GROUND-TRUTHED REGIONAL ECOSYSTEMS

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2.1.2.4 Habitat Quality Assessments

Habitat quality was also assessed within each Study Area using a combination of indicators that measure the overall viability of each Offset Area and its capacity to support the relevant MNES and MSES. The Habitat Quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (DES, 2021) (herein referred to as the Queensland Habitat Quality Assessment Method) which involved the collection of:

- landscape-scale attribute data
- site-based attribute data; and
- fauna habitat attribute data.

2.1.2.5 Landscape-scale Attributes

An assessment of landscape-scale attributes is required to determine if an offset is situated in a landscape that can achieve a conservation outcome (i.e. suitably connected and contains large tracts of vegetation). In accordance with the Queensland Habitat Quality Assessment Method, each Offset Area was assessed against the criteria summarised in Table 2. As each of the Offset Areas are located within a fragmented landscape (30-95% non-remnant vegetation), ecological corridors were also assessed however; distance to permanent water was excluded in accordance with the Queensland Habitat Quality Assessment Method.

Table 2: Landscape-scale Attributes Assessment Criteria

Attribute	Description	Assessment extent	Maximum score
Size of patch	The size of the patch assessed and associated directly connecting remnant vegetation	NA	10
Connectedness	The proportion of the site's boundary that is connected to remnant vegetation	NA	5
Context	The percentage of remnant and regrowth vegetation within a 1 km buffer of the site	1 km buffer	5
Ecological Corridors	Proximity and location to DES mapped Statewide Biodiversity Corridors (fragmented landscapes only)	Corridor type (Bioregional, regional or subregional); and location (within, outside, shares boundary)	NA

2.1.2.6 Site-based Attributes

Site-based attribute data was collected within 100 m x 50 m areas (including various sub-plots) for each assessment unit (AU), weighted in accordance with the Queensland Habitat Quality Assessment Method and compared to BioCondition benchmark values for the relevant RE benchmark (Queensland Herbarium, 2021). A summary of the site-based attributes assessed, plot area and associated maximum score is summarised in Table 3.

A Trimble TDC600 Global Positioning System (GPS) device was used to record the location of mid-point (50 m mark) of each site-based attribute site.



Table 3: Site-based Attributes Assessment Criteria

Attribute	Description	Assessment plot	Maximum score
Large trees	Number of large trees per hectare, as determined by existing BioCondition benchmarks for the associated RE	100 m x 50 m	15 [†]
Tree canopy height	Median canopy height in metres of the ecologically dominant layer	100 m x 50 m	5 [†]
Recruitment (%)	The proportion of overstorey species present at a site that are regenerating (<5 cm diameter at breast height [DBH])	100 m x 50 m	5 [†]
Tree canopy cover (%)	Vertical projection of the tree canopy crown cover along a transect	100 m transect	5 [†]
Shrub layer cover (%)	Vertical projection of the shrub layer cover of native shrubs	100 m transect	5 [†]
Coarse woody debris	The length of fallen woody logs and other coarse woody debris (>10 cm diameter and >0.5 m in length) per hectare	50 m x 20 m	5 [†]
Native plant species richness	Native plant species richness, comprising all life forms (i.e. trees, shrubs, grasses and forbs/other)	100 m x 50 m (trees) 50 m x 10 m (shrubs, grasses, forbs/other)	5 each (20 total)
Non-native plant cover (%)	Percentage cover of non-native/weed plant species	50 m x 10 m	10
Native perennial grass cover (%)	Average percentage cover of native perennial grass species	Five 1 m x 1 m	5
Organic litter cover	The average percentage cover of organic material such as fallen leaves, twigs, and branches <10 cm diameter	Five 1 m x 1 m	5

[†] Denotes site-based attributes which do not apply to grasslands REs.



2.1.2.7 Fauna species-based attributes

In conjunction with Habitat Quality assessments, targeted surveys and habitat assessments were undertaken to provide further information regarding habitat suitability for threatened fauna species. Habitat assessments included evaluation of key indicators specific to each relevant target threatened fauna species. Key habitat indicators include, but were not limited to:

- abundance of prey species (e.g. frogs)
- proximity to water and availability (permanent/ephemeral)
- abundance and depth of soil cracks
- habitat patch size and vegetation type (remnant, regrowth, etc)
- foraging opportunities
- density of tree hollows (per ha)
- percent (%) composition and cover (%) of koala food tree species
- presence and abundance of potential threats (i.e. cattle grazing, invasive species, habitat degradation)
- gilgai presence and depth; and
- abundance of woody debris.

Each key indicator was scored on a scale from 0 (absent/low) to 25 (very high) for each assessment unit and used to calculate a weighted score. A total species habitat score (out of 10) was then calculated for each threatened fauna species.

2.1.3 Targeted fauna surveys

Targeted fauna and flora surveys were undertaken in areas within each Study Area likely to support suitable habitat for target MNES and MSES fauna species. Target threatened species associated with the Winchester South Project comprise:

- *Solanum adenophorum*
- ornamental snake (*Denisonia maculata*)
- koala (*Phascolarctos cinereus*)
- greater glider (*Petauroides volans*); and
- squatter pigeon (southern subspecies) (*Geophaps scripta scripta*).

The targeted survey methods included:

- active, diurnal searches for *Solanum adenophorum* and koala presence (i.e. scratches and scat)
- waterbody watches (e.g. dams, troughs etc)
- nocturnal, spotlighting transects - these surveys were conducted on foot using a hand-held and/or head torch to detect eye shine and investigate microhabitats (e.g. decorticated bark or coarse woody debris) within each habitat type
- slow vehicle drive spotlighting was also undertaken to target; and
- opportunistic observations.



Fauna surveys conducted within each of the Study Areas aimed to meet the prescribed survey effort guidelines for the targeted threatened fauna species. However, in some cases, achieving the recommended survey effort in the guidelines was not necessary or practical, particularly where effort was measured by survey hours per potential habitat area. While the recommended survey effort in the guidelines was not always achieved for a particular species by E2M, the amount of survey effort undertaken is considered to be sufficient for the purposes of assessing habitat for the target MNES.

No fauna habitat assessments were conducted for the Inderi Study Area as it was not identified from the desktop assessment to contain habitat for targeted threatened fauna species.

2.1.4 Assessment Limitations

Ecological surveys have a range of inherent limitations associated with seasonal timing of the survey, variable climate conditions and species behaviour. As such, the field surveys conducted represent a “snapshot” in time and the lack of identification may not provide a true indication of presence or absence of flora and fauna species within the surveyed Study Areas.

2.2 Wynette Offset Area

2.2.1 Terrestrial Ecology

The Wynette Offset Area is located in the northern portion of the Wynette property and located immediately adjacent to the Winchester South Project (Figure 9). The Wynette property currently supports cattle grazing and has been modified in areas in favour of improved pasture.

The Wynette Offset Property is suitably located near the Project area, so will benefit ornamental snake, squatter pigeon (southern subspecies), koala and greater glider.

Large tracts of remnant vegetation characterised as mature, including large hollow-bearing Queensland blue gums (*Eucalyptus tereticornis*), have been retained along the Isaac River on the Wynette Offset Area (Figure 10). Floodplain vegetation comprised mixed eucalypt woodland, including poplar box (*E. populnea*) woodlands, a potential TEC under the EPBC Act.

Three threatened fauna species, the koala (*Phascolarctos cinereus*), greater glider (*Petauroides volans*) and ornamental snake (*Denisonia maculata*) were recorded in the Wynette Offset Area (Figure 13 to Figure 16). Suitable habitat for the squatter pigeon (*Geophaps scripta scripta*) was also recorded within the Study Area (Figure 17). While not confirmed within the Wynette Study Area, squatter pigeon have been regularly detected in the neighbouring impact site and are considered likely to occur in the Wynette Offset Area. As the Wynette Study Area is comprised almost entirely of MNES and MSES relevant to Stage 1 of the Project, the whole area shall be used as the Wynette Offset Area.

A number of threatening processes associated with target fauna species were observed within the Wynette Offset Area and surrounds as part of the field survey and assessments undertaken for the Project. Identified threatening processes included:

- **Habitat degradation and land clearing:** Areas within the Wynette Offset Area have been subject to historical vegetation disturbance, including broad-scale clearing (blade ploughing) and selective thinning, resulting in areas of various stages of regrowth. Repeated clearing of regrowth vegetation, particular via blade ploughing, can also continue to degrade microhabitat features present within the landscape (e.g. soils cracks and abundance of woody debris). This has resulted in fragmentation of vegetation and habitat, particularly within the south-eastern extent of the Offset Area. Riparian corridors associated with the Isaac River have remained largely intact but have been degraded due to edge effects from adjacent land use practices.



- **Grazing by livestock and trampling:** The Wynette Offset Area has been subjected to historical and ongoing livestock grazing (i.e. cattle). This has resulted in increased trampling/soil compaction, particularly around permanent and ephemeral water sources, and the introduction and spread of exotic pasture species [e.g. buffel grass (*Cenchrus ciliaris*), Indian bluegrass (*Bothriochloa pertusa*), stylo (*Stylosanthes scabra*) and sabi grass (*Urochloa mosambicensis*)].
- **Introduction and spread of weeds and exotic species:** Historical and ongoing land use practices have also resulted in the introduction and proliferation of weed species, further impacting habitat quality and condition. Weed species observed throughout the Wynette Offset Area include prickly pear (*Opuntia* spp.), Harrisia cactus (*Harrisia martinii*), rubber vine (*Cryptostegia grandiflora*), parthenium (*Parthenium hysterophorus*), lantana (*Lantana camara*), red natal grass (*Melinis repens*) and introduced pasture species.
- **Entanglement with barbed wire fencing:** a number of existing fence-lines utilising barbed wire traverse the Wynette Offset Area and pose a threat to native fauna species, particularly greater gliders, that can become entangled.
- **Introduction and proliferation of pest fauna:** Evidence of pest fauna (e.g. scat and tracks), including wild dogs and feral cats were observed within the Wynette Offset Area during the field surveys. Pest fauna species including, feral dogs, cats and pigs, were observed within low to moderate abundance during field assessments for the Project within adjacent areas to the Wynette Offset Area (E2M Pty Ltd, 2021). In addition to preying on native fauna species, including koalas and squatter pigeon, pest fauna can also further degrade habitat through competition for prey fauna (e.g. frogs) and destruction of habitat (e.g. wetlands) and microhabitat features (e.g. soil cracks) (*Conservation Advice for Petauroides Volans (Greater Glider (Southern and Central))*, 2022; Department of Agriculture, Water and the Environment, 2022a; DEWHA, 2014).

Due to the remote location and relative isolation from key built-up areas (i.e. cities, highways etc), existing threats associated with vehicle collisions (i.e. identified threat for the koala) within the Offset Area are limited.

Although these threatening processes were observed within and surrounding the Wynette Offset Area, a number of threatened species were recorded and suitable habitat remains present. A summary of threatening processes observed and the potential impacts to target MNES and MSES fauna species is provided in Table 4.

Table 4: Existing threatening processes within the Wynette Offset Area

Threats	Description	Target MNES/MSES fauna species
Habitat degradation and land clearing	• Clearing of vegetation and habitat for agricultural development • Reduced population viability resulting from habitat isolation • Fragmentation of habitat and reduced mobility • Habitat degradation from edge effects	Koala Greater glider (central and southern) Squatter pigeon (southern subspecies) Ornamental snake



Threats	Description	Target MNES/MSES fauna species
Grazing by livestock and trampling	- Overgrazing by livestock reducing availability of foraging resources - Competition and displacement of native grasses with introduced pasture species - Habitat/microhabitat degradation from livestock trampling and soil compaction	Squatter pigeon (southern subspecies) Ornamental snake
Introduction of weeds and exotic species	- Competition and displacement of native species with weedy species - Reduced mobility from dense infestations of woody weeds	Koala Squatter pigeon (southern subspecies)
Entanglement with barbed wire fencing	Mortality and entanglement with barbed wire fences within habitat areas	Greater glider (central and southern)
Introduction and proliferation of pest fauna	- Predation from wild dogs, feral cats and foxes - Wetland/gilgai habitat degradation from feral pigs (trampling and disturbance to water quality) - Increased competition on prey fauna species and degradation of prey habitat (e.g. frogs)	Koala Greater glider (central and southern) Squatter pigeon (southern subspecies) Ornamental snake

2.2.2 Groundwater Dependant Vegetation

Groundwater Dependent Ecosystems (GDEs) have been assessed in detail as part of the Sections 4 and 5 of Appendix F of the Draft EIS (Integrated Assessment of Impacts on Groundwater Dependent Ecosystems), including consideration of cumulative impacts, including:

- riparian vegetation along the Isaac River
- vegetation associated with wetlands on the Isaac River floodplain and tributaries
- vegetation on the Isaac River floodplains and tributaries (outside of wetlands); and
- terrestrial vegetation in the vicinity of the Project mapped as having low potential for groundwater interaction.



2.2.2.1 Riparian Vegetation along the Isaac River

The riparian vegetation associated with the Isaac River (RE 11.3.25) within the Wynette Offset Area has a moderate to high potential to meet the definition of a terrestrial GDE, with any dependency on groundwater likely to be facultative, during dry times.

2.2.2.2 Vegetation associated with Wetlands on the Isaac River Floodplain and Tributaries

There are various patches of woodland associated with ephemeral wetlands on the Isaac River floodplain within the Wynette Offset Area and its tributaries that are mapped as having high or moderate potential for groundwater interaction due to sub-surface presence of groundwater (i.e. terrestrial GDEs) in the GDE Atlas (BoM, 2020). The riparian vegetation surrounding these ephemeral wetlands comprises woodlands dominated by *Eucalyptus coolabah*, with *Eucalyptus populnea* (within RE 11.3.3). These eucalypt species are known to be facultative users of groundwater in some locations (Doody et al., 2019; Kath et al., 2014; Orellana et al., 2012). These species were observed in a number of locations within the Study Area for the Terrestrial Ecology Assessment (E2M, 2021) where the depth to groundwater is in excess of 40 m (SLR, 2021) and therefore, would be too deep for the trees to access (e.g. RE 11.4.9).

2.2.2.3 Vegetation on the Isaac River Floodplains and Tributaries (Outside of Wetlands)

There are various patches of woodland dominated by RE 11.3.2 (*Eucalyptus populnea*) on the floodplains of the Isaac River (outside of wetlands) within the Wynette Offset Area that are mapped as having moderate potential for groundwater interaction due to sub-surface presence of groundwater (i.e. terrestrial GDEs) in the GDE Atlas (BoM, 2020). *Eucalyptus populnea* is known to be a facultative user of groundwater in some locations (Kath et al., 2014). In the floodplain locations, *Eucalyptus populnea* is most likely to access groundwater following floods when groundwater levels rise. Depth to groundwater in these floodplain locations ranges from 10 m to 15 m in the Quaternary alluvium (SLR, 2021). It is concluded that the woodland dominated by RE 11.3.2 has a moderate potential to meet the definition of a terrestrial GDE, and any dependency on groundwater is likely to be facultative, during dry times.

2.2.2.4 Terrestrial Vegetation in the Vicinity of the Project Mapped as Low Potential for Groundwater Interaction

There are various patches of woodland in the vicinity of the Project that are mapped as having low potential for groundwater interaction due to sub-surface presence of groundwater (i.e. terrestrial GDEs) in the GDE Atlas (BoM, 2020). One of these patches of woodland is within the Wynette Offset Area and consists of mostly RE 11.5.3. These REs comprise of mainly *Eucalyptus populnea* (which is a facultative user of groundwater in some locations). The depth to groundwater beneath these patches ranges from 15 m to 25 m as the shallowest aquifer is associated with the regolith (SLR, 2021). Water within the regolith material is generally highly saline, but can be brackish to moderately saline with an average total dissolved solids (TDS) of 10,510 mg/L, ranging between 1,460 mg/L and 18,600 mg/L (SLR, 2021). It is important to note that RE 11.5.3 occurs elsewhere where the depth to groundwater is in excess of 40 m (Appendix F of the Draft EIS) and too deep for the trees to access. As such, it is concluded that these woodland patches (e.g. RE 11.5.3) within the Wynette Offset Area have a low potential to meet the definition of a terrestrial GDE, and any dependency on groundwater in the regolith is likely to be facultative, during dry times (if at all). Also, it is unlikely RE 11.5.3 would be dependent on the groundwater due to the poor quality (high salinity) of the groundwater source.

2.2.2.5 GDE Impact Assessment

SLR (2021) developed a cumulative numerical groundwater model that included the Olive Downs Project, Moorvale South Project, Eagle Downs Mine, Daunia Mine, Poitrel Mine and Peak Downs Mine. Figures 6-5 and 6-6 of the Groundwater Assessment (SLR, 2021) provides the cumulative drawdown predictions from



the numerical groundwater model within the Isaac River alluvium and the regolith groundwater systems. The cumulative numerical groundwater modelling in the Isaac River alluvium and regolith did not predict any drawdown within the any part of the Wynette Offset Area (SLR, 2021), and therefore there would be no mechanism for impacts to the potential or actual GDEs. As such, the Project is not predicted to have any material impacts (including cumulative impacts) on potential or actual GDEs in the Wynette Offset Area due to groundwater drawdown or changes in groundwater quality.

2.2.3 Olive Downs Mine Infrastructure

Pembroke Resources South Pty Ltd are proponents for the Olive Downs Mine water pipeline (EPBC 2017/7868), rail spur (EPBC 2017/7870) and electricity transmission line (2017/7869). The *Olive Downs Coking Coal Project - Environmental Impact Statement* (Pembroke, 2018) assessed the impacts of the Olive Downs Mine infrastructure. This infrastructure is approved under the State and Commonwealth legislation and will be located outside of the Wynette Offset Area to the south and east (Figure 10). The habitat within the Wynette Offset Area will remain connected to the more extensive habitat along the Isaac River to the north. The location of the approved Olive Downs Mine water pipeline, rail spur and electricity transmission line would not compromise the viability of the four listed threatened species within the Wynette Offset Area. Pembroke Resources South Pty Ltd are required to construct and operate the infrastructure in accordance with the State and Commonwealth approvals.

2.3 Ellensfield Offset Area

The Ellensfield Offset Area is located within the Ellensfield property located approximately 22 km north-east of the township of Moranbah (Figure 9).

The Ellensfield Offset Area remains largely vegetated, with a small amount of non-remnant vegetation, several dams, watering points and boundary fences located throughout the Study Area. Vegetation within the Ellensfield Study Area is characterised by eucalyptus woodland dominated by narrow-leaved ironbark (*E. crebra*)/silver-leaved ironbark (*E. melanophloia*) (Figure 11).

Within the Ellensfield Study Area, there are no permanent waterbodies however, there are numerous ephemeral creeks. Two ephemeral watercourses, Carborough Creek (stream order 4) and Spring Creek (stream order 3), traverse the eastern central part of the Ellensfield Study Area, with numerous tributaries of lower order feeding into these systems.

Three threatened fauna species, the squatter pigeon (southern subspecies) (*Geophaps scripta scripta*), the koala (*Phascolarctos cinereus*) and the greater glider (*Petauroides volans*) were recorded during the field surveys of the Ellensfield Study Area (Figure 18, Figure 19 and Figure 20). Though the Koala was not directly recorded within the Ellensfield Offset Area, Koala scratches were recorded on multiple trees and the majority of the Ellensfield Offset Area was identified as being suitable Koala habitat as it is comprised of remnant eucalypt woodland dominated by koala food trees (Figure 19).

Ornamental snake habitat was not observed in the Ellensfield Study Area during the field surveys. The species is generally recorded in association with Brigalow vegetation communities with gilgai and cracking clay soils of which none were observed within the Ellensfield Study Area.

A number of threatening processes associated with target fauna species were observed within the Ellensfield Offset Area as part of the field survey and assessments undertaken for the Project. Identified threatening processes included:

- **Habitat degradation:** Areas within the Ellensfield Offset Area have been subject to livestock grazing and selective thinning. Continued modification of the floristic diversity within the ground and shrub layers can result from changes in livestock grazing intensity, particularly when coupled with extreme



weather events. These factors have the potential to inhibit or reduce the native floristic diversity within these strata, associated with a reduction in palatable native species and competition (Dorrough et al., 2006). These changes in native species composition can contribute to reduced habitat quality for other native species, including threatened fauna species.

- **Introduction and spread of weeds and exotic species:** Historical and ongoing land use practices have resulted in the introduction and proliferation of weed species, further impacting habitat quality and condition. Weed species observed throughout the Ellensfield Offset Area include buffel grass (*Cenchrus ciliaris*), harissia cactus (*Harrisia martini*), flannel weed (*Sida cordifolia*) and parthenium (*Parthenium hysterophorus*) and introduced pasture species.
- **Entanglement with barbed wire fencing:** a number of existing fence-lines utilising barbed wire traverse the Ellensfield Offset Area and pose a threat to native fauna species, particularly greater gliders, that can become entangled.
- **Introduction and proliferation of pest fauna:** A number of feral pests, including wild dogs, cats and pigs have been previously recorded in proximity to the Ellensfield Offset Area (DES, 2022). Evidence of pest fauna (e.g. scat and tracks), namely wild dogs, were observed within the Ellensfield Offset Area during the field surveys. Pest species are known to prey on native fauna species, including koalas and squatter pigeon, impacting abundance and population viability within the landscape.

While areas within the Ellensfield Offset Area have been subject to historical vegetation disturbance, primarily selective thinning, habitat was comprised largely of remnant vegetation. Connectivity to surrounding habitat was also largely intact, with limited fragmentation observed.

Due to the remote location and relative isolation from key built-up areas (i.e. cities, highways etc), existing threats associated with vehicle collisions (i.e. identified threat for the koala) within the Offset Area were also limited.

A summary of threatening processes observed and the potential impacts to target MNES and MSES fauna species is provided in Table 5.

Table 5: Existing threatening processes within the Ellensfield Offset Area

Threats	Description	Target MNES/MSES fauna species
Habitat degradation	• Selective clearing of vegetation and habitat for agricultural development • Fragmentation of habitat and reduced mobility • Habitat degradation from edge effects	Koala Greater glider (central and southern)
Introduction of weeds and exotic species	• Competition and displacement of native species with weedy species • Reduced mobility from dense infestations of woody weeds	Koala



Threats	Description	Target MNES/MSES fauna species
Entanglement with barbed wire fencing	Mortality and entanglement with barbed wire fences within habitat areas	Greater glider (central and southern)
Introduction and proliferation of pest fauna	Predation from wild dogs and feral cats	Koala Greater glider (central and southern)

2.4 Inderi Offset Area

The Inderi Offset Area is located on the Inderi property which is a cattle station located approximately 20 km north-west of the township of Rolleston in Central Qld (Figure 9).

Vegetation within the Inderi Offset Area is characterised by improved grazing pastures with patches of remnant native grasslands and open-woodlands as well as regrowth vegetation (Figure 12). An existing offset area secured by BHP Mitsubishi Alliance is also located within the Inderi property adjacent to the Inderi Offset Area.

Field surveys conducted during the Baseline Report (Section 2.1) identified approximately 232.21 ha of remnant native grassland (REs 11.8.11) listed as 'Of Concern' under the Qld *Vegetation Management Act 1999*. While the extent of weeds could not definitively be assessed during the survey period (dry season), the condition of the vegetation at the time of the survey was adequate to qualify RE 11.8.11 as 'good quality' Natural Grasslands TEC. Due to the percentage foliage cover of non-native grasses (>5%), no 'best quality' Natural Grasslands TEC was observed within the Study Area (Figure 21).

The field surveys also identified 132.57 ha of poor condition natural grasslands (recognised as non-remnant vegetation) which do not currently qualify as the Natural Grasslands TEC due to greater than 30% cover of non-native species.

The extent of these natural grasslands (i.e. RE 11.8.11) form the Inderi Offset Area.

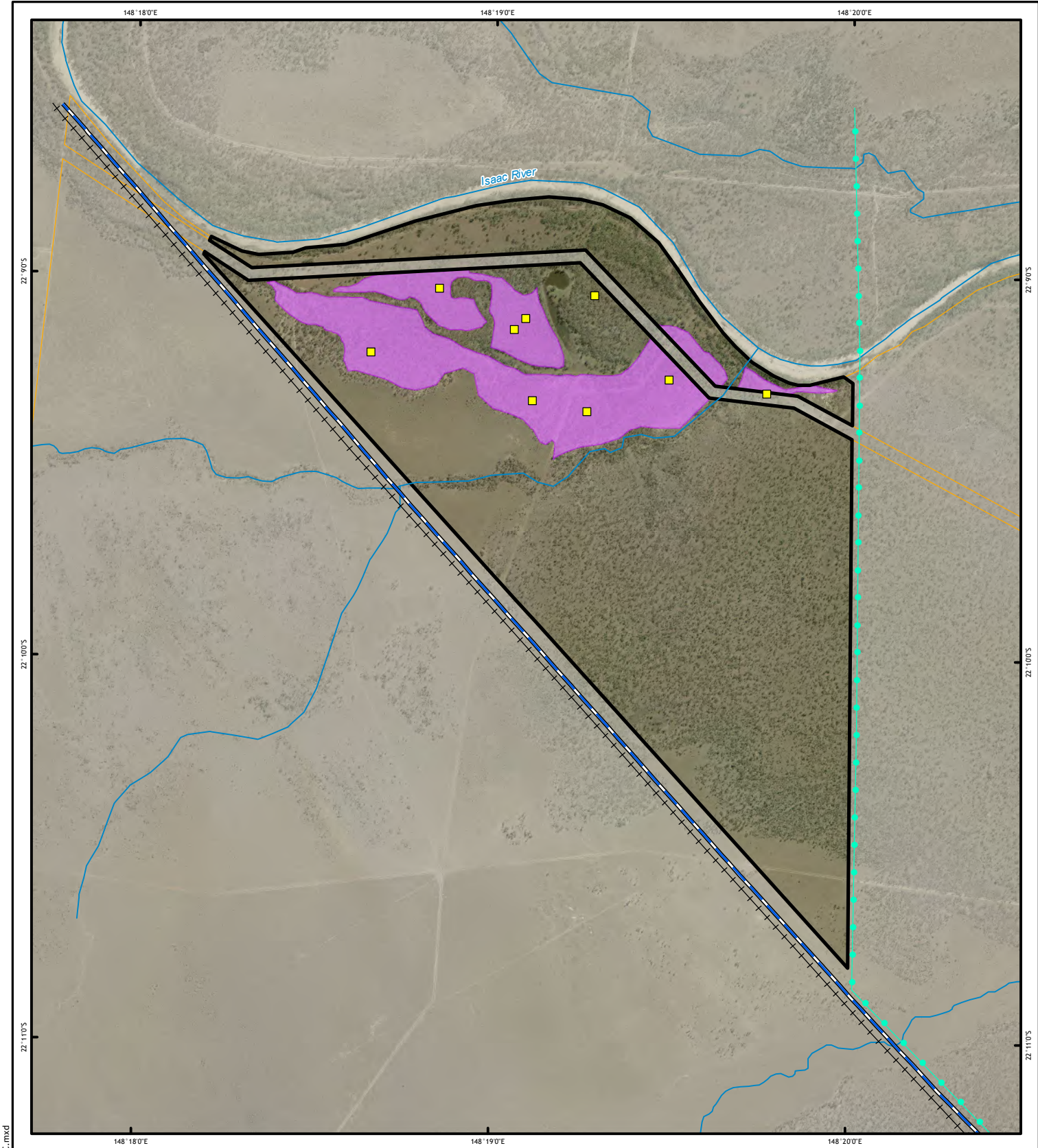
A number of threatening processes associated with the Natural Grasslands TEC were observed within the Inderi Offset Area as part of the field survey. Identified threatening processes included:

- Livestock grazing and pasture improvement:** Inappropriate grazing regimes can result in the displacement of palatable native grass species, resulting in the proliferation and spread of unpalatable species (Department of Environment and Resource Management (DERM), 2011). Overgrazing can also lead to trampling of species and compaction of the soil, impeding the development of root structures of native grass species (TSSC, 2009). The effect of high-intensity grazing can also be exacerbated in conjunction with extreme climatic events, such as drought, potentially altering plant species composition and facilitating the spread of non-native species over time (Souther et al., 2020). Pasture improvement through the introduction of exotic pasture species can also displace and out-compete native species over a number of years (TSSC, 2009). A number of introduced pasture species were present within the Inderi Offset Area including buffel grass (*Cenchrus ciliaris*), sabi grass (*Urochloa mosambicensis*), *Setaria parviflora* and red natal grass (*Melinis repens*).



- **Introduction and spread of weeds and exotic species:** Encroachment and spread of exotic, environmental weeds can out-compete native flora species, altering the vegetative structure and compositions within native grassland communities (TSSC, 2009). Environmental weed species observed within the Inderi Offset Area include parthenium (*Parthenium hysterophorus*), *Opuntia* spp. and caltrop (*Tribulus terrestris*), *Physalis* spp. and *Rhynchosia minima*.





Legend

- TEC Assessment Site
- Seasonal Watercourse / Drainage Feature
- Wynette Offset Area
- Wynette Property Boundary
- Poplar Box community that does not currently meet the Poplar Box TEC criteria
- Olive Downs Infrastructure**
- - - Rail
- Water Pipeline
- - - ETL

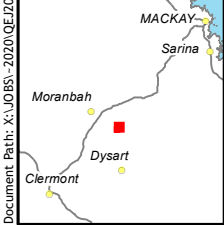


Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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5	Issued for Review	DL	BD	18/10/2022
4	Issued for Review	DL	BD	25/05/2022
Rev	Description	Drawn	Approved	Date

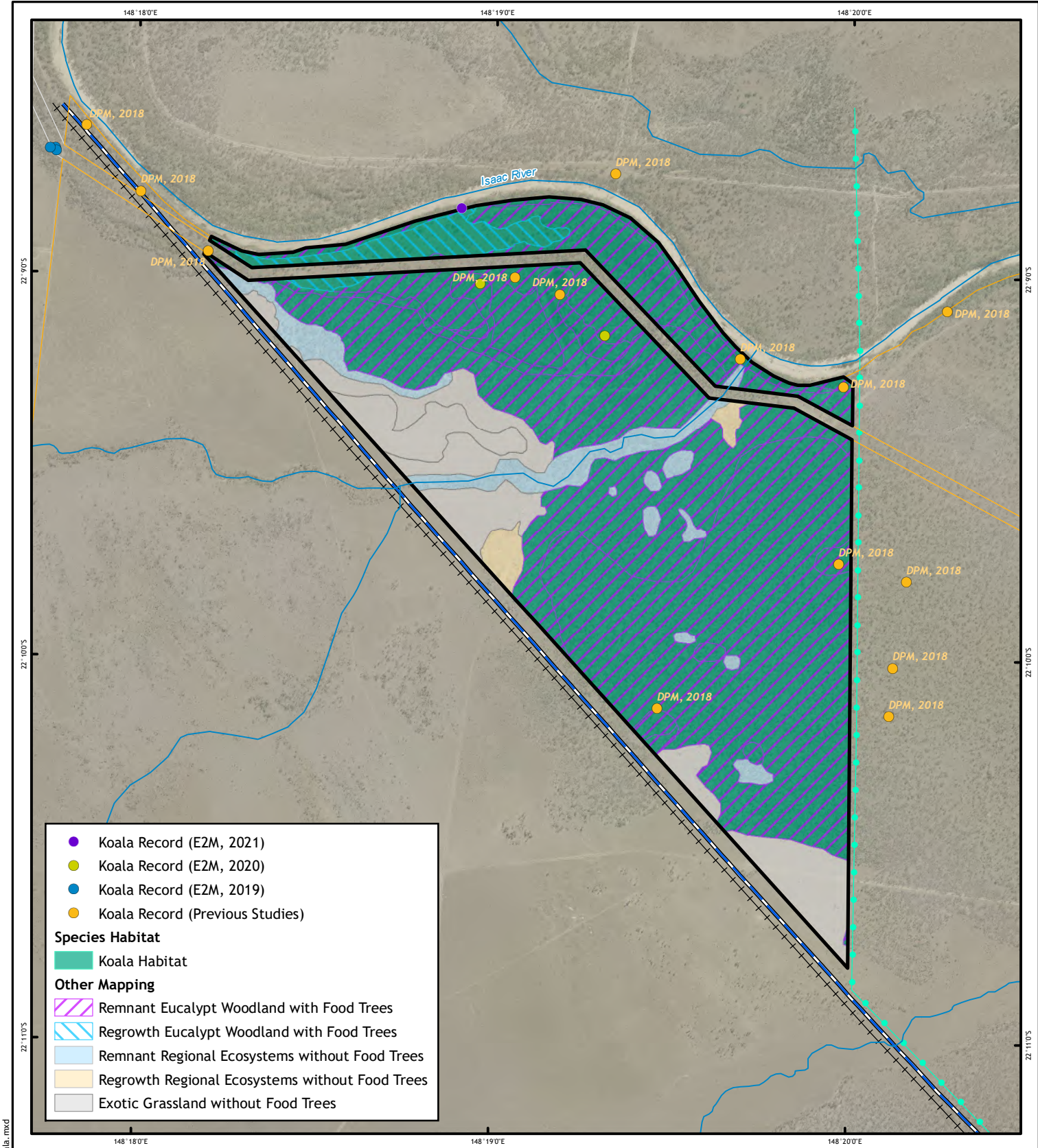


FIGURE 13: WYNETTE OFFSET AREA THREATENED ECOLOGICAL COMMUNITIES

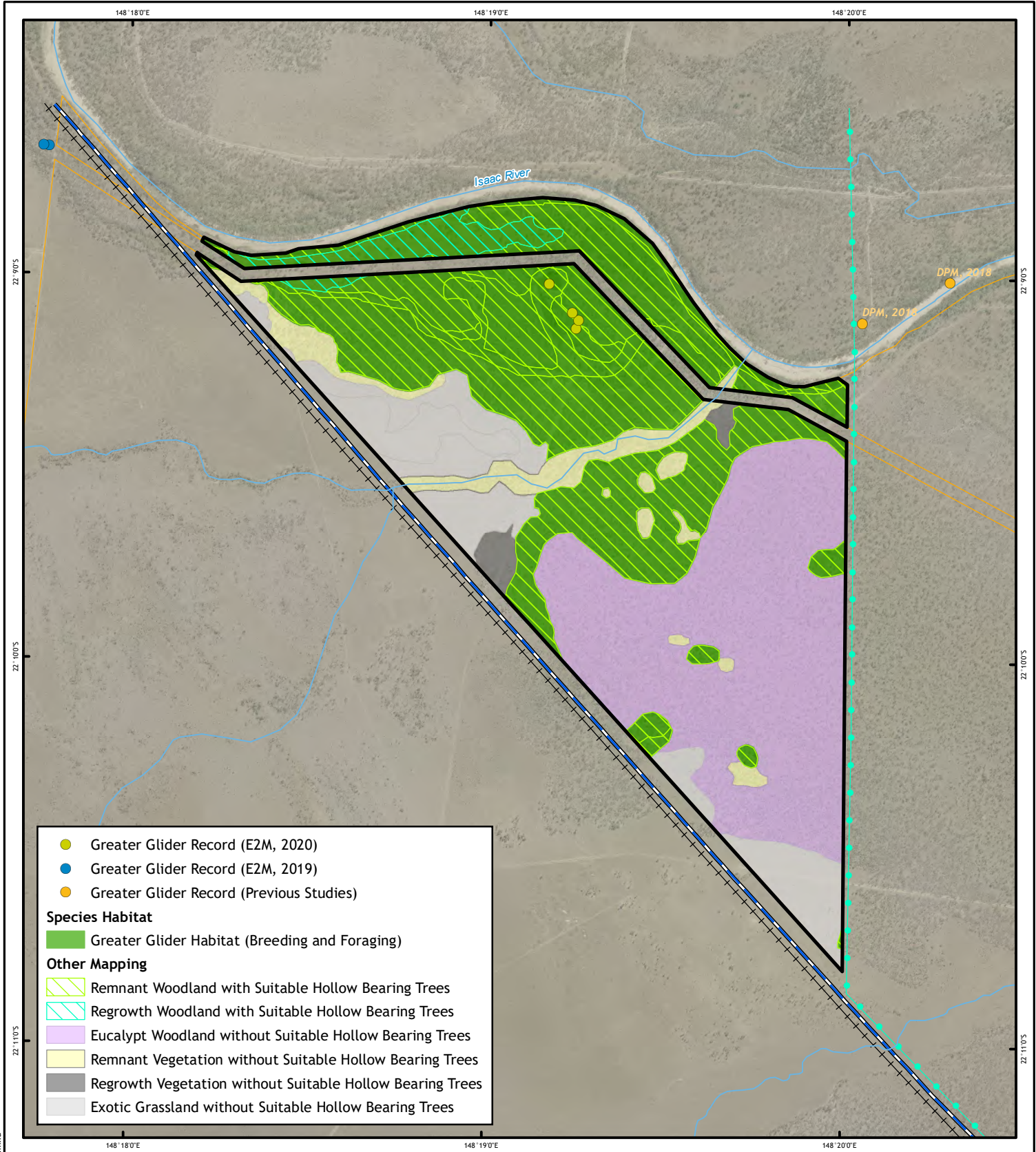
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Legend

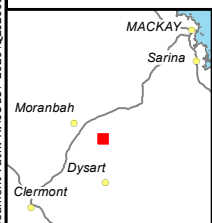
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- Wynette Property Boundary
- Wynette Offset Area
- Olive Downs Infrastructure**
- Rail
 - Water Pipeline
 - ETL



Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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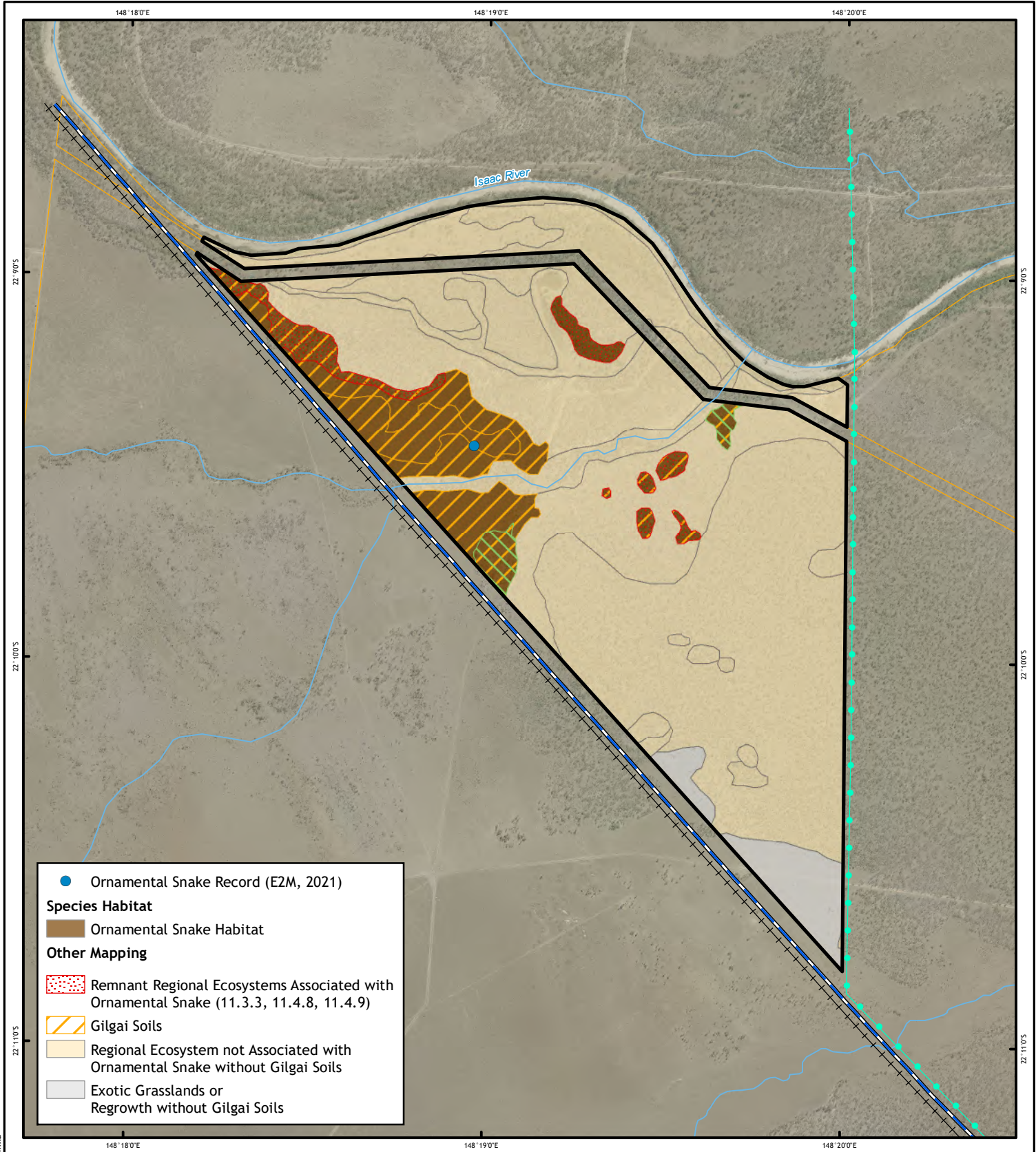
6	Issued for Use	DL	BD	18/10/2022
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Rev	Description	Drawn	Approved	Date



FIGURE 15: WYNETTE OFFSET AREA GREATER GLIDER HABITAT

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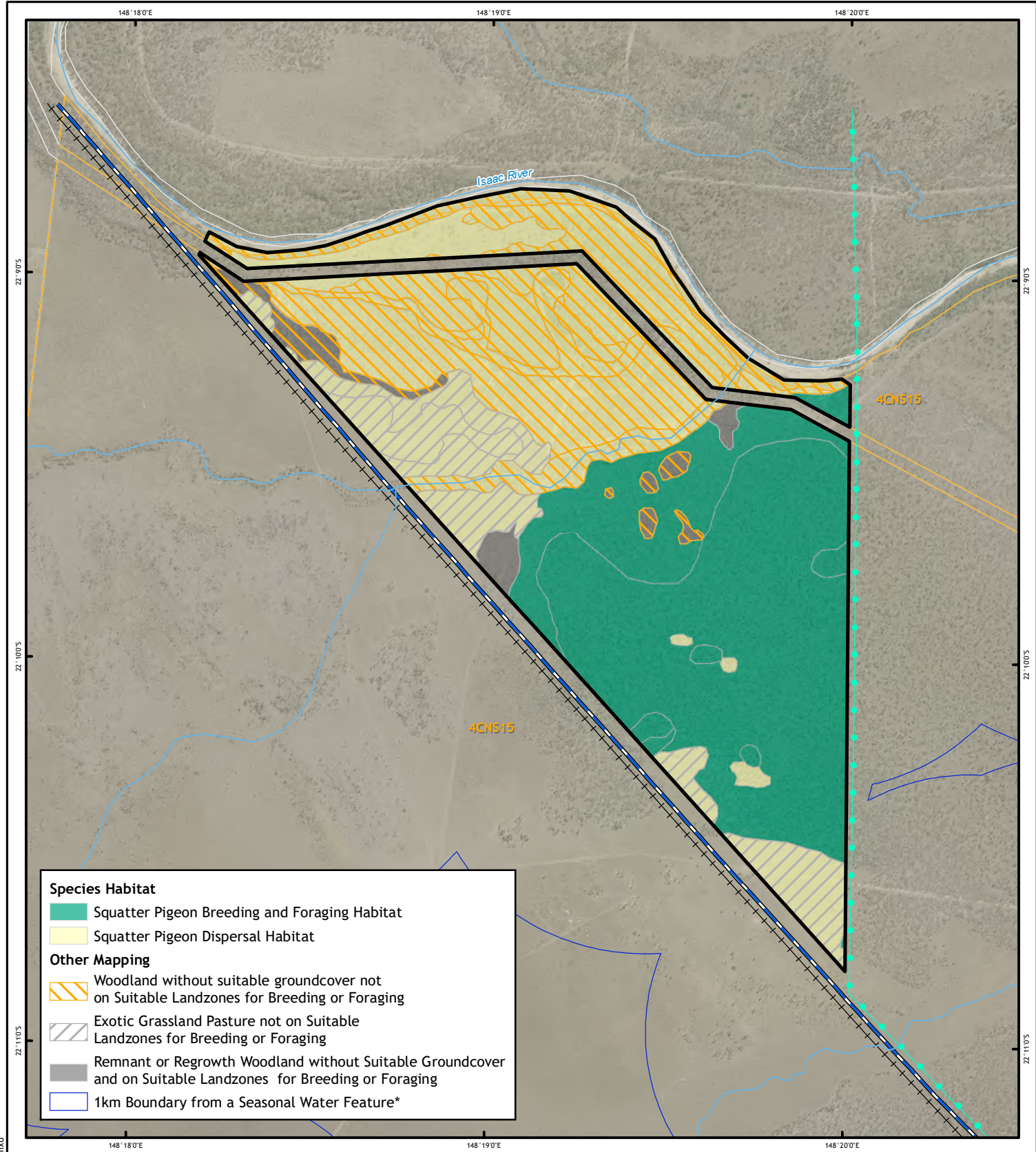
FIGURE 16: WYNETTE OFFSET AREA ORNAMENTAL SNAKE HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

Legend

6	Issued for Use	DL	BD	18/10/2022
5	Issued for Use	DL	BD	25/05/2022
Rev	Description	Drawn	Approved	Date



Legend

Seasonal Watercourse / Drainage Feature

Cadastre

Wynette Property Boundary

Wynette Offset Area

Olive Downs Infrastructure

Rail

Water Pipeline

ETL

Scale 1:25,000 (A4)

0 0.5 1 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

FIGURE 17: WYNETTE OFFSET AREA SQUATTER PIGEON HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

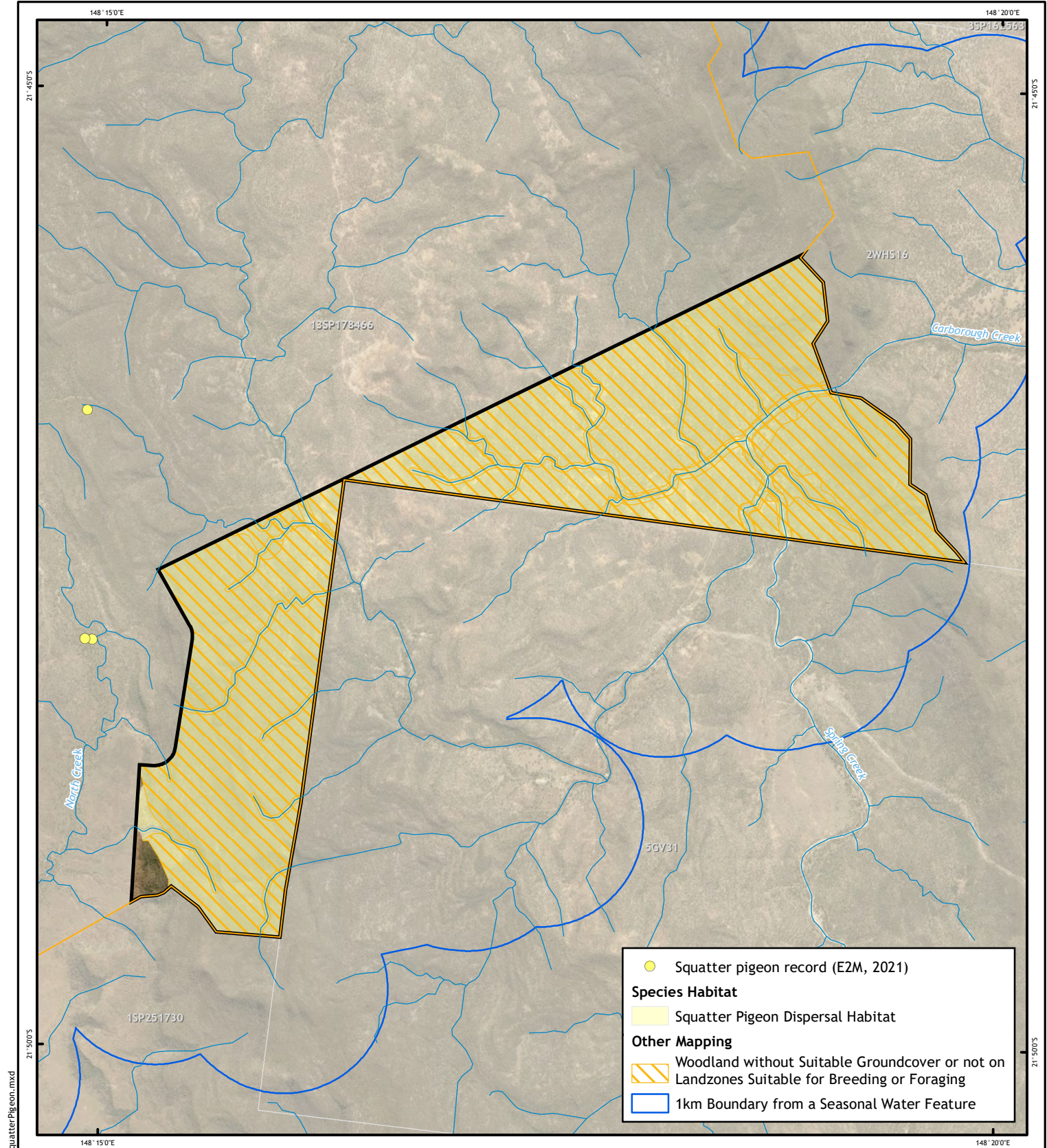
Map Number 1 of 1 Job Number QEJ20054 Rev 6

Notes:

- Aerial Imagery: © DNRME 2018, Whitehaven 2019
- Watercourse: © Geoscience Australia 2018
- Road: © PSMA 2014
- Cadastre: © DNRME 2019
- GTRE: © EZM 2020

Rev	Description	Drawn	Approved	Date
6	Issued for Use	DL	BD	18/10/2022
5	Issued for Use	DL	BD	05/07/2022

e2m



Legend

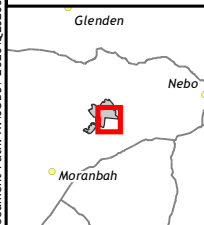
- Seasonal Watercourse / Drainage Feature
- Cadastre
- Ellensfield Property Boundary
- Ellensfield Offset Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastre: © DOR 2021
Watercourse: © Geoscience Australia

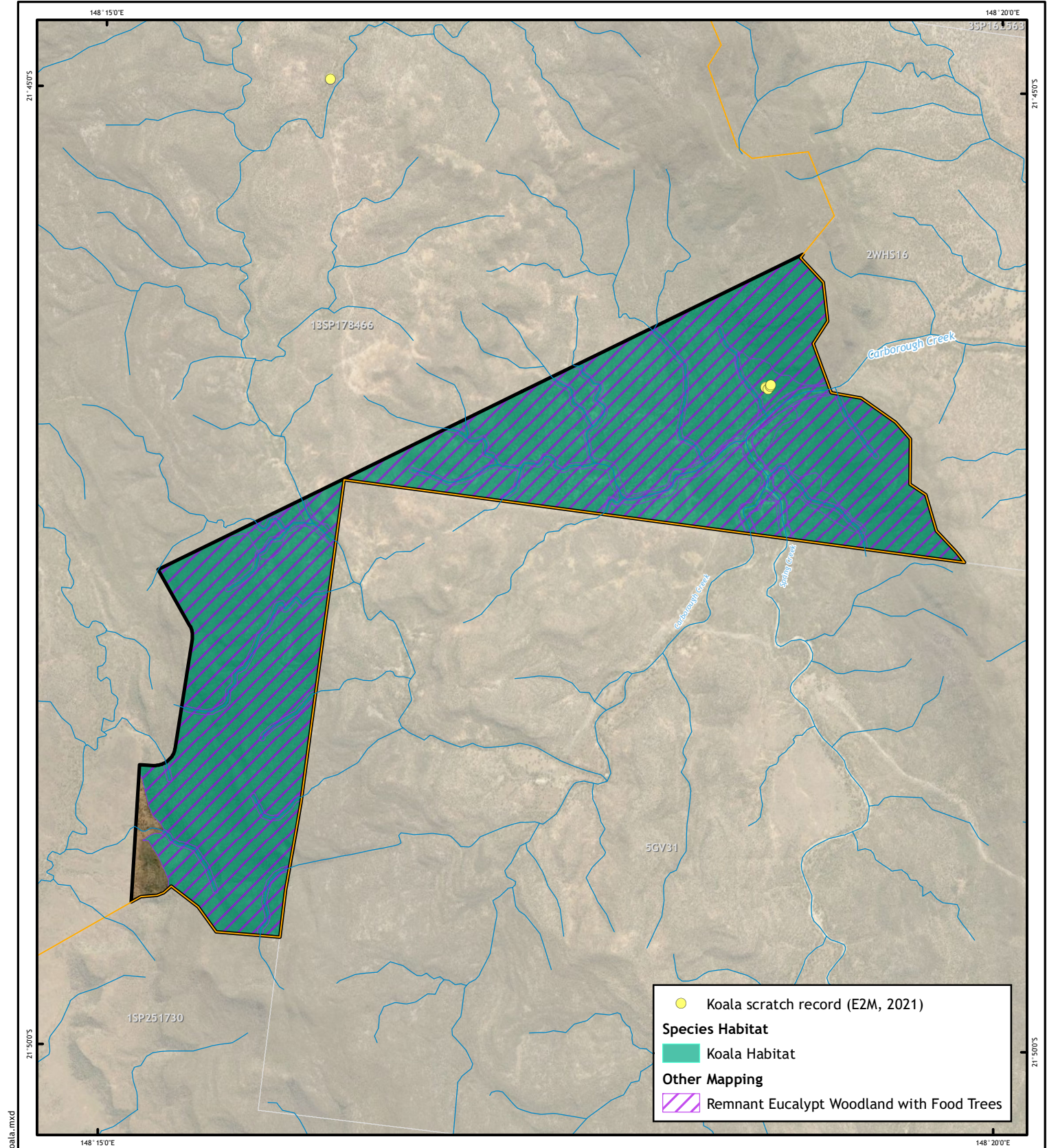
5	Issued for Use	DL	BD	05/07/2022
6	Issued for Use	DL	BD	7/10/2022
Rev	Description	Drawn	Approved	Date



FIGURE 18: ELLENSFIELD OFFSET AREA SQUATTER PIGEON HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6



Legend

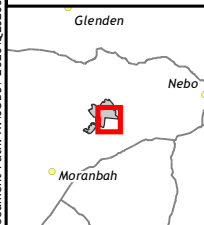
- Seasonal Watercourse / Drainage Feature
- Cadastre
- Ellensfield Property Boundary
- Ellensfield Offset Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastre: © DOR 2021
Watercourse: © Geoscience Australia

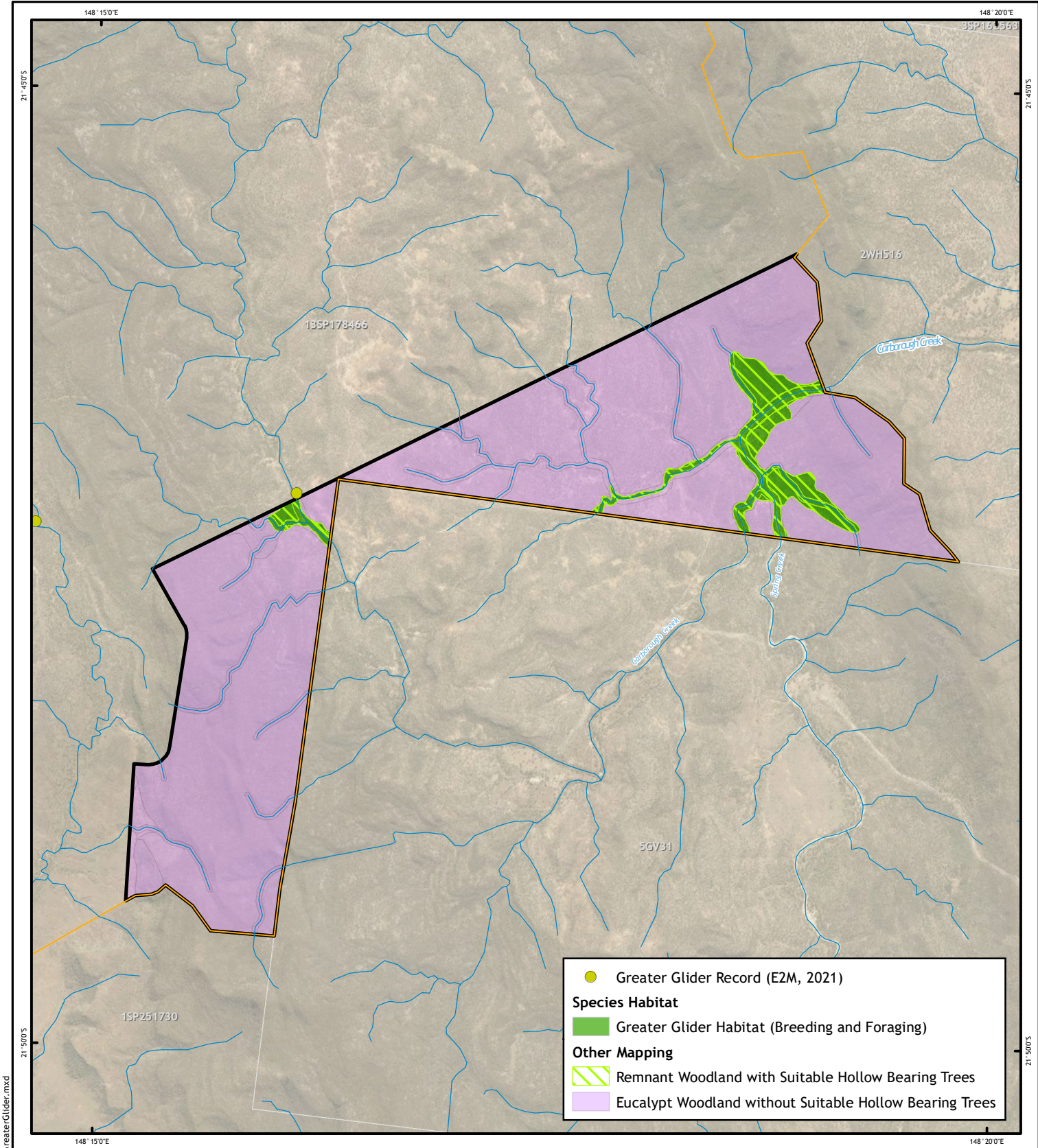
5	Issued for Use	DL	BD	05/07/2022
6	Issued for Use	DL	BD	7/10/2022
Rev	Description	Drawn	Approved	Date



FIGURE 19: ELLENSFIELD OFFSET AREA KOALA HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6



Legend

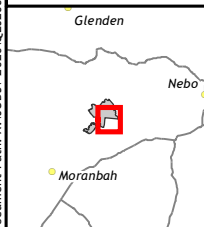
- Seasonal Watercourse / Drainage Feature
- Cadastral
- Ellensfield Property Boundary
- Ellensfield Offset Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastral: © DOR 2021
Watercourse: © Geoscience Australia

5	Issued for Use	DL	BD	05/07/2022
6	Issued for Use	DL	BD	7/10/2022
Rev	Description	Drawn	Approved	Date



FIGURE 20: ELLENSFIELD OFFSET AREA GREATER GLIDER HABITAT

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

2.5 Management Measures

Table 6 details the proposed management measures to be implemented across the Offset Areas, including details on how they would improve habitat quality for relevant MNES and MSES.

Table 6: Proposed Management Measures

Management Measure	Rational	Relevant Offset Areas	Relevant Matters
Livestock management	• Installation and maintenance of stock proof fencing: Installation and maintenance of stock proof fence will allow for effective controlled grazing to take place and exclude livestock when required. • Controlled grazing of livestock: Monitoring of livestock grazing intensity will assist in improving the cover and composition of native species in the ground cover as well as minimise the potential spread of exotic grasses. Specifically, grazing during dry season to reduce exotic ground cover, and limiting/excluding grazing during the wet season to prevent soil compaction. No grazing within squatter pigeon (southern subspecies) habitat during the breeding season (April to end October). • Exclusion of livestock during the wet season: Exclusion of livestock during the wet season will reduce soil compaction and enable native groundcover species to flower and set seed, increasing native cover and diversity over time. • Exclusion of livestock from the Inderi Offset Area	• Wynette Offset Area • Inderi Offset Area • Ellensfield Offset Area	• Ornamental snake • Squatter pigeon • Natural Grasslands TEC



Management Measure	Rational	Relevant Offset Areas	Relevant Matters
Weed control	• Weed identification: Detailed field survey of weeds is required to identify the distribution and type of species present at year 1 (baseline data). This will allow for prioritisation of potential hot spots and high-risk species. • Weed prevention: Control of weeds is difficult once established / introduced. Prevention of introduction or further spread will increase the success rate of weed management across the Offset Area. • Weed control: Weed control will reduce the extent and abundance of weeds across the offset areas, which in turn will assist in improving native species richness and recruitment.	• Wynette Offset Area • Inderi Offset Area • Ellensfield Offset Area	• Ornamental snake • Squatter pigeon • Natural Grasslands TEC
Pest animal control	• Pest fauna identification: Detailed field survey of pest fauna is required to identify the distribution and type of species present. This will allow for prioritisation of potential hot spots and high risk species (e.g. wild dogs and pigs). • Pest fauna prevention: Control of pest fauna is difficult once established / introduced. Prevention of introduction or further spread will increase the success rate of pest management across the offset area. • Pest fauna control: Pest fauna control will reduce the abundance of pest fauna across the offset areas, which will in turn reduce predation risk of threatened fauna, reduce habitat degradation through tramping and pig-rooting, and reduce the potential spread of weeds.	• Wynette Offset Area • Inderi Offset Area • Ellensfield Offset Area	• Ornamental snake • Squatter pigeon • Koala • Greater gilder • Natural Grasslands TEC



Management Measure	Rational	Relevant Offset Areas	Relevant Matters
Fire management	• Fire management program: Altered fire regimes are interrelated with confounding environmental threats including weed encroachment, changes to vegetation structure and damage to fire sensitive vegetation communities. As such, a fire management program, produced by a suitably qualified professional, will be established for the Offset Area and incorporate fire guidelines for REs present. • Fire breaks: Fire breaks will be established along existing fence lines and any new fencing that is to be installed. This will reduce the risk of uncontrolled burns which may negatively affect the offset areas.	• Wynette Offset Area • Inderi Offset Area • Ellensfield Offset Area	• Ornamental snake • Squatter pigeon • Koala • Greater gilder • Natural Grasslands TEC
Vegetation regrowth management	• Thinning of dense undesirable regrowth: Where regrowth becomes un-naturally thick and dominated by species not consistent with the pre-cleared RE, vegetation thinning may occur to assist in achieving mature vegetation consistent with the prescribed RE.	• Wynette Offset Area	• Ornamental snake • Squatter pigeon
Barbed wire fencing management	• Barbed wire fencing within and surrounding the offset areas (that presents a risk of entanglement, a recognised risk to this species [DCCEEW, 2022]) would be modified so the top strand is plain wire fencing.	• Wynette Offset Area • Ellensfield Offset Area	• Greater gilder



Management Measure	Rational	Relevant Offset Areas	Relevant Matters
Greater Glider Nest Box Programme	• Installation and maintenance of 60 nest boxes: designed specifically for the Greater Glider (i.e. contains features that will benefit use by the gliders). • Monitoring: using Smart Nest Box principles (i.e. boxes fitted with video/audio data collection capability)	• Wynette Offset Area • Ellensfield Offset Area	• Greater glider

Offset Management Plans would be prepared for the Offset Areas in consultation with a suitably qualified person and include:

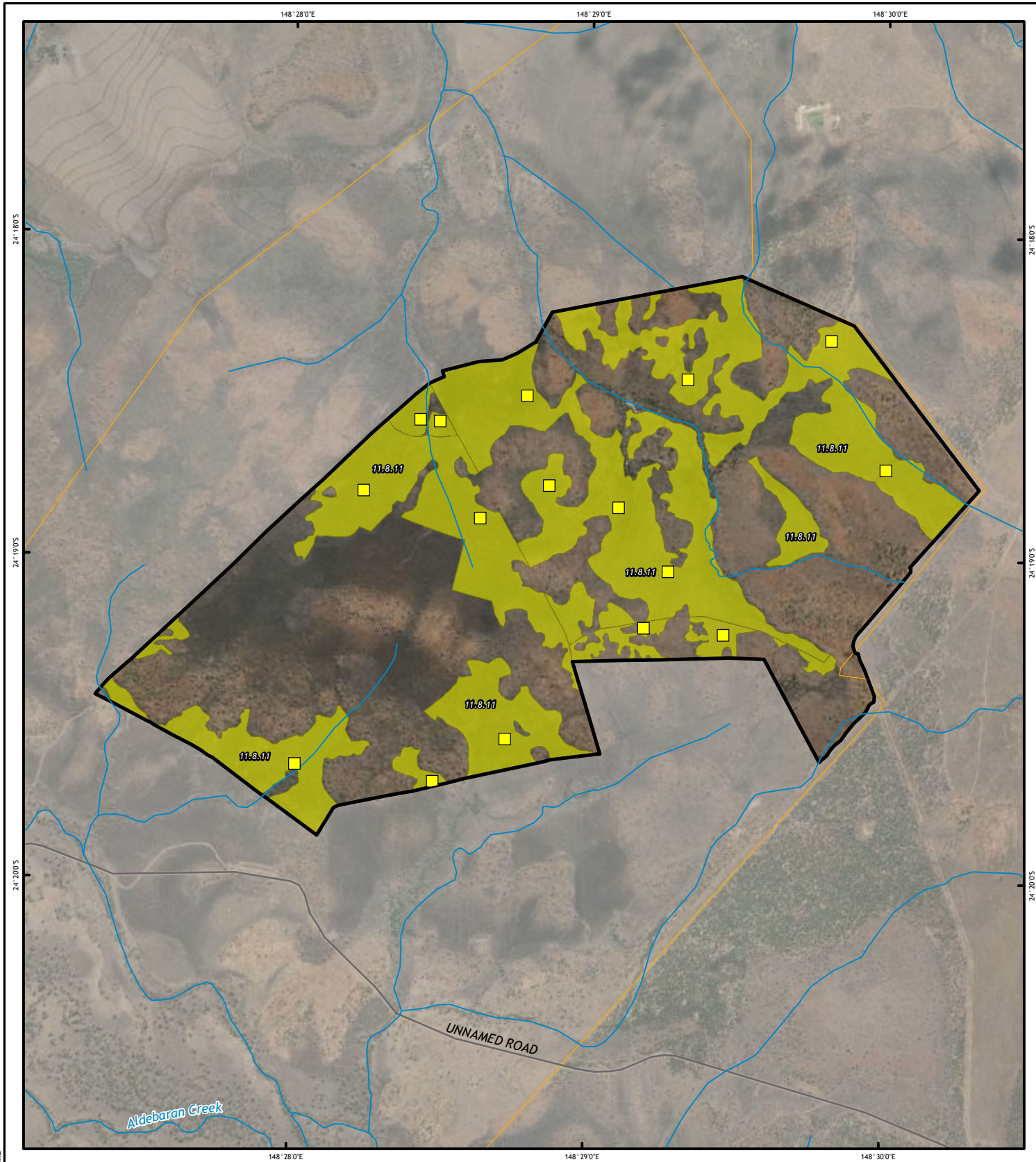
- the results of the baseline report for each Offset Area, including a description of the condition of the Offset Areas, including relevant MNES and/or their habitat
- a description of the management measures (including timing, frequency and duration) that would be implemented in each of the Offset Areas
- a discussion of how proposed management measures take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans
- completion criteria and performance targets for evaluating the effectiveness of the Offset Management Plan implementation, and criteria for triggering corrective actions
- a program to monitor, report on and review the effectiveness of the Offset Management Plan; and
- a description of potential risks to the successful implementation of the Offset Areas, and contingency measures that would be implemented to mitigate against these risks.

The following threat abatement plans would be considered in the Stage 1 Offset Management Plans:

- *Threat Abatement Plan for Predation by Feral Cats* (DoE, 2015)
- *Threat Abatement Plan for Competition and Land Degradation by Rabbits* (Department of the Environment and Energy (DEE), 2016)
- *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs* (Department of the Environment and Heritage, 2005); and
- *Threat Abatement Plan for Predation by the European Red Fox* (DEWHA, 2008).



Document Path: X:\JOBS\2020\QEJ20054\GIS\QEJ20054_OAA_21_Inderi_TEC.mxd

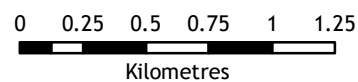


Legend

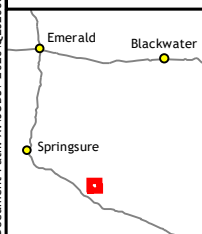
- Road
- Seasonal Watercourse / Drainage Feature
- Inderi Property Boundary
- Inderi Offset Area
- TEC Assessment Site
- Natural Grasslands Threatened Ecological Community



Scale 1:30,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © ESRI 2020
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastre: © DNRME 2020
GTRE: © EZM 2020

5	Issued for Use	DL	BD	05/07/2022
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FIGURE 21: INDERI OFFSET AREA THREATENED ECOLOGICAL COMMUNITIES

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

3 EPBC Act Offsets Assessment Guide Results

The *EPBC Act Offset Assessment Guide* (DSEWPaC, 2012) uses a balance sheet approach to quantify and compare impacts and offsets to evaluate the suitability of offset proposals. The *EPBC Act Offsets Assessment Guide* requires a series of input information regarding the impact to MNES and the proposed offset. The following subsections provide support for the input values used in the *EPBC Act Offsets Assessment Guide*. Table 7 provides a summary of the MNES areas and percentage from each of the Offset Areas for the Stage 1 impact areas.

Table 7: Summary of the MNES Areas required on each of the Offset Areas for the Stage 1 Impacts

MNES		Wynette Offset	Ellensfield Offset	Inderi Offset	Total
Natural Grasslands TEC	area (ha)	0	0	215	215
	% of offset	0	0	100.32	100.32
ornamental snake	area (ha)	63.5	0	0	63.5
	% of offset	100.10	0	0	100.10
squatter pigeon (southern subspecies) breeding and foraging habitat	area (ha)	192	0	0	192
	% of offset	100.38	0	0	100.38
koala	area (ha)	285	0	0	285
	% of offset	100.52	0	0	100.52
greater glider	area (ha)	65	88.66	0	153.66
	% of offset	42.58	58.08	0	100.66



3.1 Natural Grasslands TEC

The Natural Grasslands TEC is characterised by native grasses and the lack or absence of emergent woody vegetation (TSSC, 2009). Approximately 80.9 ha of Natural Grassland TEC would be impacted by the Project during Stage 1. The impacts on the Natural Grasslands TEC are proposed to be offset entirely (100.32%) within 215 ha of ‘good quality’ Natural Grasslands TEC on the Inderi Offset Area (Table 8, Figure 21). Natural Grasslands TEC is comprised of native perennial grass species located on undulating plains and with minimal cover of woody vegetation. Due to their vulnerability to disturbance and degradation associated with agricultural land uses, two condition classes, ‘best quality’ and ‘good quality’, are described for the TEC. Determination of the associated condition class is dependent on a variety of criteria including patch size, richness of specific native grass indicator species, tussock density, woody cover and cover of exotic species.

Field surveys identified approximately 232.21 ha of the ‘good quality’ Natural Grasslands TEC characterised by remnant RE 11.8.11 within the Inderi Offset Area (Table 8, Figure 21, Plate 1). Natural Grasslands TEC indicator species present included: white spear-grass (*Aristida leptopoda*), satin-top grass (*Bothriochloa erianthoides*), Queensland bluegrass (*Dichanthium sericeum*), native millet (*Panicum decompositum*), yabila grass (*P. queenslandicum*), *Paspalidium globoideum* and cup grass (*Eriochloa crebra*).

Several exotic species were recorded throughout the Natural Grassland TEC including parthenium (*Parthenium hysterophorus**), buffel grass (*Cenchrus ciliaris**), red Natal grass (*Melinis repens**) and *Physalis lanceifolia**. While the extent of weeds could not definitively be assessed during the survey period (dry season), the condition of the vegetation at the time of the survey was adequate to qualify RE 11.8.11 as the ‘good quality’ Natural Grasslands TEC. Due to the percentage foliage cover of non-native grasses (>5%), no ‘best quality’ Natural Grasslands TEC was observed within the Inderi Offset Area.



Plate 1. Natural Grassland within the Inderi Offset Area



Table 8: Natural Grasslands Offset Assessment Guide - Inderi Offset Area (Natural Grasslands TEC (good quality))

Aspect	Input	Justification
Conservation Status	Endangered	EPBC Act Listing Status
Stage 1 Impacted habitat (ha)	80.9	There is approximately 80.9 ha of Natural Grasslands TEC (good quality) within the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	6	The habitat quality score has been calculated using the <i>Guide to Determining Terrestrial Habitat Quality: Methods for Assessing Habitat Quality under the Queensland Environmental Offsets Policy Version 1.3</i> (Queensland Habitat Quality Assessment Method) (DES, 2021) (Appendix A). The native grasslands are permeated with improved pasture grasses (e.g. buffel grass) and parthenium.
Offset Area	Inderi	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the offset area under the VM Act.
Time until ecological benefit	10 years	Management of livestock and active management to reduce weeds is likely to provide an ecological benefit to this grassland (future quality described below) within 10 years. Native grasslands are described as dynamic ecosystems, where species composition can change, yearly and seasonally, in response to rainfall, temperature, fire, grazing pressure and management (Langford, 2005). Natural grassland communities comprise a variety of annual and perennial species with shorter timeframes to reproduce and mature when compared with woody species. Habitat quality assessment using site-based attribute for grasslands REs is calculated using only five attributes (grass and for species richness, non-native cover, perennial grass cover and organic litter cover). As such, the associated changes in habitat quality scores are not dependent on improvement in other structural features that can take longer periods of time to change (i.e. number of large trees, canopy cover, coarse woody debris etc.). When coupled with effective land management, including active weed management, it is anticipated improvement in native species richness and cover within the ground layer will be achieved over a shorter timeframe. The Inderi Offset Area is also located adjacent to an existing offset area (137.2 ha), secured in 2014 for values associated with the Natural Grasslands TEC. Based on the close proximity to adjacent native grasslands, the reintroduction and spread of seed is likely to be further promoted when in conjunction with other management measures (i.e. restricted livestock management and weed control). Consequently, it has been assumed that the predicted improvement in habitat quality on the Inderi Offset Area under proposed management measures identified for native grassland ecosystems will generally take effect within 10 years.
Start area (ha) (size of the offset)	215	There is approximately 215 ha of Natural Grasslands TEC (good quality) in the Inderi Offset Area.



Aspect	Input	Justification
Start Quality (0 to 10)	4	The start quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). Several exotic species were recorded throughout the Natural Grassland TEC in the offset area including parthenium (<i>Parthenium hysterophorus</i>*), buffel grass (<i>Cenchrus ciliaris</i>*), red Natal grass (<i>Melinis repens</i>*) and <i>Physalis lanceifolia</i>*. Habitat Quality assessments within the TEC areas recorded non-native cover ranging from 10% to 50% over the 50 m x 10 m plots. The Inderi Offset Area is subject to grazing livestock.
Risk of loss (%) without offset	0.09	In accordance with the 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (Maseyk et al. 2017), an annual risk of loss of 0.09% for the Central Highlands Regional Council area has been applied.
Future quality without offset (scale of 0-10)	3	The main identified threats to natural grasslands are grazing, cropping, pasture improvement and weed encroachment (DEWHA, 2008a). Without the offset, the habitat quality of the Natural Grasslands TEC within the Inderi Offset Area is expected to decrease due to ongoing threats, mostly livestock grazing and weeds. Livestock grazing pressures can facilitate the spread of environmental weeds and non-native pasture grasses, reducing the recruitment and abundance of native species within the ground layer (Kutt & Fisher, 2011). Proliferation of environmental weeds, particularly parthenium (<i>Parthenium hysterophorus</i>), within heavily stocked areas and around watering points can further degrade vegetation conditions and form dense infestations, increasing competition for resources with native species (DAF, 2022; Kutt & Fisher, 2011). These threats are likely to decrease species richness, increase non-native cover and decrease perennial native grass cover over time. The future quality without the offset score has been informed by the Queensland Habitat Quality Assessment Method (DES, 2021) by adjusting the likely future species richness, non-native cover and perennial native grass cover.
Risk of loss (%) with offset	0	Within the next 10 years, with the offset, there is a 0% risk that the ecological values would be lost.
Future quality with offset (scale of 0-10)	6	Removal of livestock (i.e. no permitted livestock grazing in the Inderi Offset Area) and active management to reduce weeds is likely to increase the future quality of the Natural Grasslands. The future quality with the offset score has been informed by the <i>Queensland Habitat Quality Assessment Method</i> (DES, 2021) by adjusting the likely future species richness, non-native cover and perennial native grass cover. As described above, natural grassland communities comprise a variety of annual and perennial species with shorter timeframes to reproduce and mature when compared with woody species. When coupled with effective land management, including active weed management, it is anticipated improvement in native species richness and cover within the ground layer will be achieved. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires.



Aspect	Input	Justification
Confidence in the result (%)	85	There is a high level of confidence that the decrease of habitat values in the Inderi Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The methods proposed to enhance Natural Grasslands habitat quality (Section 2.5) are consistent with the approved conservation advice (DEWHA, 2008) and the confidence in the result is high.
Calculator Output - % of Impact Offset	100.32	



3.2 Ornamental Snake

Residual impacts within Stage 1 of the Impact Area would be offset (100.10%) using 63.5 ha within the Wynette Offset Area (Table 9).

Within the Wynette Study Area, one ornamental snake was observed during the wet season survey located in non-remnant vegetation characterised by gilgai and clay soils, characteristic of RE 11.4.9 (Figure 16; Plate 2).

Ornamental snake habitat within the Wynette Study Area is mapped in Figure 16 (Plate 2). Approximately 70.76 ha of ornamental snake habitat was identified within the Wynette Study Area and is associated with:

- RE 11.3.3
- RE 11.4.8
- RE 11.4.9; and
- non-remnant vegetation with gilgai and clay soils.



Plate 2. Ornamental Snake Observed During the Wet Season Survey within the Wynette Study Area

Table 9: Ornamental Snake Offset Assessment Guide - Wynette Offset Area

Aspect	Input	Justification
Conservation Status	Vulnerable	EPBC Act Listing Status
Stage 1 Impacted habitat (ha)	50	There is 50 ha of habitat for the ornamental snake in the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	4	The habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). The ornamental snake habitat generally comprises remnant and regrowth brigalow, coolabah and pastureland dominated vegetation communities that contain gilgai or ephemeral drainages.
Offset Area	Wynette	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the offset area under the VM Act.
Time until ecological benefit	10 years	Managing the threatening processes affecting the ornamental snake habitat quality (e.g. feral species [wild dogs and pigs], invasive weeds, no livestock grazing of gilgai during the wet season [DoE, 2014]) is expected to improve the quality and composition of habitat for the ornamental snake as described below under 'future quality with offset'. It is considered that the ecological benefit to the gilgai habitat (future quality described below) is likely to occur within 10 years. This timeframe is considered adequate as there would be regular control of feral predators (wild dogs), regular control of feral pigs that are known to degrade the species habitat (DoE, 2014), control of weeds and no incompatible grazing. Gilgai comprise a variety of annual and perennial flora species with shorter timeframes to reproduce and mature when compared with woody species.
Start area (ha) (size of the offset)	63.5	The Stage 1 impact is being offset with 63.5 ha of ornamental snake habitat in the Wynette Offset Area.
Start Quality (0 to 10)	4	The start quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). The impacts of historical clearing, cover of non-native species and reduced quantity of woody debris, reduced the site-based attribute scores. Non-native flora species, particularly introduced pasture grasses, were observed throughout the Offset Area. Habitat Quality assessments recorded non-native cover ranging from 5% to 80% over the 50 m x 10 m plots. Evidence of pest fauna (e.g. scat and tracks), including wild dogs and pigs were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021). Pest animals, particularly feral pigs, can also further degrade habitat through competition for prey fauna (e.g. frogs) and destruction of habitat (e.g. wetlands) and microhabitat features (e.g. soil cracks).



Aspect	Input	Justification
Risk of loss (%) without offset	20	Areas within the Wynette Offset Area have been subject to historical vegetation disturbance, including broad-scale clearing (blade ploughing) and selective thinning, resulting in areas of various stages of regrowth. Repeated clearing of regrowth vegetation, particular via blade ploughing, can also continue to degrade microhabitat features present within the landscape (e.g. soils cracks and abundance of woody debris). This has resulted in fragmentation of vegetation and habitat, particularly within the south-eastern extent of the Offset Area. The risk of loss is a percentage figure that describes the chance that the habitat on the proposed offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). Within the next 20 years, without the offset, it is conservatively assumed that there is a 20% risk that the ecological values would be lost as most of the ornamental snake habitat in the Wynette Offset Area is non-remnant vegetation with gilgai and clay soils that is permitted to be cleared under Qld legislation. Without the offset the non-remnant areas will continue to be periodically cleared (or treatment with chemical pellets that kill saplings) to maintain the agricultural production of the area.
Future quality without offset (scale of 0-10)	3	Consistent with the <i>Commonwealth How to Use The Offsets Assessment Guide</i>, degradation to the quality of a site due to current management practises has been incorporated in the quality score. Without the offset, the ornamental snake habitat quality within the Wynette Offset Area is expected to decrease due to ongoing threats, mostly feral species [wild dogs and pigs], incompatible grazing regimes, and weed encroachment (DoE, 2014). The habitat would also be degraded through clearance (or treatment with chemical pellets that kill saplings) of non-remnant vegetation with gilgai and clay soils. The future quality without the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover • shrub cover • recruitment; and • coarse woody debris. Also, there was consideration of factors not assessed in the methods (i.e. the potential effects of feral species and habitat degradation from ongoing management [clearance/chemical treatment] of regrowth).
Risk of loss (%) with offset	0	Within the next 20 years, with the offset, there is a 0% risk that the ecological values would be lost.



Aspect	Input	Justification
Future quality with offset (scale of 0-10)	6	The future quality of ornamental snake habitat is expected to increase in the Wynette Offset Area as the threatening factors hindering the current habitat value (e.g. feral species [wild dogs and pigs], incompatible grazing regimes and weed encroachment [DoE, 2014]) would be managed. Gilgai comprise a variety of annual and perennial flora species with shorter timeframes to reproduce and mature. Prevention of any future vegetation clearing will enable non-remnant regrowth to mature, increasing the site-based attribute values relating to tree and shrub cover, as well as coarse woody debris. Management of weeds, pests and livestock grazing will also assist in facilitating recruitment of native forbs and grasses within the ground layer. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires. The future quality with the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover; and • shrub cover. Also, there was consideration of factors not assessed in the methods (i.e. management of feral species, retention of regrowth and improved fire management).
Confidence in the result (%)	85	There is a high level of confidence that the decrease of habitat values in the Wynette Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The Wynette property is freehold land owned by Whitehaven WS and as a result, there is certainty regarding the management commitments (Section 2.5). The methods proposed to enhance ornamental snake habitat quality (Section 2.5) are consistent with the approved conservation advice (DoE, 2014).
Calculator Output - % of Impact Offset	100.10	

3.3 Squatter pigeon (southern subspecies)

Consistent with the squatter pigeon SPRAT profile and mapped habitat within the Winchester South Project (E2M, 2021), the squatter pigeon (southern subspecies) habitat is categorised into breeding and foraging, foraging, and dispersal habitat.

Squatter Pigeon habitat is distinguished by ground-layer vegetation that:

- consists of patchy, native, perennial tussock grasses, or a mix of perennial tussock grasses and low shrubs or forbs; and
- does not cover more than 33% of the ground (DAWE, 2021; Squatter Pigeon Workshop, 2011).

Squatter pigeon foraging habitat is within 3 km of a suitable, permanent or seasonal waterbody, while breeding habitat is located within 1 km of a suitable, permanent or seasonal waterbody (DAWE, 2021; Squatter Pigeon Workshop, 2011). Within the Wynette Study Area, permanent water sources are limited to farm dams and water troughs.

Dispersal habitat is any forest or woodland occurring between patches of foraging or breeding habitat which facilitates movement between patches of foraging habitat, breeding habitat and/or waterbodies.



Dispersal habitat includes vegetation where the groundcover layer has been thinned through current land use practices in a way that suits the species (e.g. light cattle grazing). The species does disperse into highly modified or degraded habitats, including cleared areas which are within 100 m of remnant trees or patches of habitat.

Breeding and foraging habitat would only be offset on the Wynette Offset Area (Table 10).

Residual impacts on the squatter pigeon (southern subspecies) breeding and foraging habitat within Stage 1 of the Impact Area are proposed to be offset (100.38%) using 192 ha in the Wynette Offset Area (Figure 17).

Whilst there is approximately 1,324.68 ha of suitable squatter pigeon (southern subspecies) dispersal habitat throughout the Ellensfield Study Area (Figure 18), dispersal habitat cannot be used to offset impacts to breeding and foraging habitat.

Squatter pigeon (southern subspecies) was not recorded within the Wynette Study Area during either of the two field assessments: however, the species was detected within the Wynette property and the adjacent Winchester South Project area (DPM Envirosciences, 2018; E2M, 2021).

Squatter pigeon (southern subspecies) foraging and breeding habitat consists of remnant or regrowth open-forest to sparse, open-woodland or low-woodland dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species on:

- well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. land zone 5); and
- lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. land zone 7) (DAWE, 2021; Squatter Pigeon Workshop, 2011).

Suitable habitat throughout the Wynette Study Area includes vegetation comprising of REs:

- 11.5.3 (remnant and non-remnant regrowth)
- 11.5.9b (remnant); and
- 11.5.17 (remnant).



Within the Wynette Study Area, squatter pigeon (southern subspecies) foraging habitat was mapped within 3 km of a suitable, permanent or seasonal waterbody and breeding habitat was mapped within 1 km of permanent water (Figure 18). Dispersal habitat (251.4 ha) was mapped as any vegetation community (remnant, non-remnant or regrowth) located between two patches of foraging and/or breeding habitat (including exotic grassland pasture less than 100 m wide between suitable foraging and breeding habitat).

Table 10: Squatter Pigeon Breeding and Foraging Habitat Offset Assessment Guide - Wynette Offset Area

Aspect	Input	Justification
Conservation Status	Vulnerable	EPBC Act Listing Status
Stage 1 Impacted habitat (ha)	53.8	There is 53.8 ha of potential breeding habitat for this species in the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	6	The habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A of the Winchester South Project EIS). Within the disturbance area, squatter pigeons were recorded from a single area within the vicinity of a farm dam located along the western boundary, where they were recorded over multiple survey events. Based on the SPRAT Database the habitat surrounding the dam (land zone 9) is not consistent with land zones in which the species is known to forage and breed (i.e. land zones 5 and 7). However, given the frequency at which the species was recorded on land zone 9, areas of remnant woodland on land zone 9 within 3 km of the dam are considered to provide suitable foraging habitat for the species.
Offset Area	Wynette	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the offset area under the VM Act.
Time until ecological benefit	10 years	Managing the threatening processes affecting squatter pigeon (southern subspecies) habitat quality (e.g. feral species predation, invasive weeds, incompatible grazing regimes) (DAWE, 2021) is expected to improve the quality and composition of habitat for the squatter pigeon (southern subspecies) (southern). It is considered that the ecological benefit to the groundcover (future quality described below) is likely to occur within 10 years because within this timeframe, there would be regular control of feral predators, control of weeds and no incompatible grazing. Further, this species can use regrowth or partly modified vegetation communities and typically the ground cover in foraging and breeding habitat is patchy consisting of native, perennial tussock grasses or a mix of perennial tussock grasses and low shrubs or forbs (DAWE, 2021). The groundcover in the offset area comprises of flora species with shorter timeframes to reproduce and mature when compared with woody species.
Start area (ha) (size of the offset)	192	The Stage 1 impact is being offset with 192 ha of breeding and foraging habitat for the squatter pigeon within in the Wynette Offset Area.



Aspect	Input	Justification
Start Quality (0 to 10)	6	The start habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). Squatter pigeon (southern subspecies) was not recorded within the Wynette Offset Area during either of the two field assessments: however, the species was detected within the Wynette property and the adjacent Winchester South Project area (E2M, 2021; DPM Envirosciences, 2018). A number of non-native pasture grasses and environmental weed species were observed throughout the Offset Area, including buffel grass (<i>Cenchrus ciliaris</i>), red natal grass (<i>Melinis repens</i>), <i>Opuntia</i> spp. and Indian bluegrass (<i>Bothriochloa pertusa</i>). Habitat Quality assessments recorded non-native cover ranging from 8% to 40% over the 50 m x 10 m plots. Evidence of pest fauna (e.g. scat and tracks), including wild dogs and feral cats were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021). Vegetation clearing, habitat degradation from livestock grazing are also identified as a key threats to the species (TSSC, 2015).
Risk of loss (%) without offset	0.42	In accordance with the 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (Maseyk et al. 2017), an annual risk of loss of 0.42% for the Isaac Regional Council area has been applied.
Future quality without offset (scale of 0-10)	5	Without the offset, the squatter pigeon (southern subspecies) habitat quality in the Wynette Offset Area is expected to decrease due to ongoing feral predators, incompatible grazing regimes and weed encroachment. The future quality without the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover • shrub cover • recruitment; and • coarse woody debris. Also, there was consideration of factors not assessed in the methods (i.e. the potential effects of feral species).
Risk of loss (%) with offset	0	Within the next 20 years, with the offset, there is a 0% risk that the ecological values would be lost.



Aspect	Input	Justification
Future quality with offset (scale of 0-10)	7	The future quality of squatter pigeon (southern subspecies) habitat is expected to increase in the Wynette Offset Area as the threatening factors hindering the current habitat value (e.g. feral predators, incompatible grazing regimes and weed encroachment [DAWE, 2021]) would be managed. Prevention of any future vegetation clearing will enable non-remnant regrowth to mature, increasing the site-based attribute values relating to tree and shrub cover. Management of weeds, pests and livestock grazing will also assist in facilitating recruitment of native forbs and grasses within the ground layer. Targeted pest control for wild dogs, foxes and feral cats will also assist in minimising potential threats to the species. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires. The future quality with the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover; and • shrub cover. Also, there was consideration of factors not assessed in the methods (i.e. management of feral species and improved fire management).
Confidence in the result (%)	85	There is a high level of confidence that loss of habitat values in the Wynette Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The Wynette property is freehold land owned by Whitehaven WS and as a result, there is certainty regarding the management commitments (Section 2.5). The methods proposed to enhance squatter pigeon (southern subspecies) habitat quality (Section 2.5) are consistent with the approved conservation advice (TSSC, 2015).
Calculator Output - % of Impact Offset	100.38	



3.4 Koala

Residual impacts on koala habitat within Stage 1 of the Impact Area are proposed to be offset (100.52%) using 285 ha in the Wynette Offset Area (Table 11) (Figure 14).

Studies of koala distribution, habitat utilisation and diet in central Queensland identified *E. populnea*, *E. coolabah*, *E. tereticornis* and *E. crebra* or *E. drepanophylla* as key diet species for koalas in the region (Ellis et al., 2018; Melzer et al., 2014). *E. camaldulensis* and *E. tereticornis* are also considered to be a primary food trees for koalas within the Isaac Regional Council Local Government Area (Australian Koala Federation (AKF), 2015).

Three koalas were observed within the Wynette Study area during the dry and wet season surveys (Figure 14). The observations were recorded within the remnant eucalypt woodland fringing the Isaac River (RE 11.3.4, 11.3.25 and RE 11.3.27b). The species was also previously recorded within the Isaac River corridor as part of the Winchester South Project ecological surveys (E2M, 2021). Several historic records for the species are also located within and in proximity to the Wynette Study Area (DES, 2018b). The Isaac River is a fauna movement corridor offering contiguous, remnant habitat in an otherwise largely fragmented landscape.

The koala habitat within the Wynette Study Area is comprised of remnant and regrowth eucalypt woodland dominated by food trees (Figure 13). Koala habitat within the Wynette Study Area is mapped within remnant REs 11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3, 11.5.9b, 11.5.17, and regrowth REs 11.3.4, equating to a combined total of approximately 401.32 ha. Remnant and regrowth vegetation within the Wynette Study Area was dominated by *A. harpophylla* (i.e. RE 11.4.9, 11.4.8 and 11.3.1), contained limited food trees and was not considered suitable habitat for the species. Similarly, areas containing disturbed, exotic grasslands were excluded from habitat areas due to limited food trees being present.





Plate 3. Koala scratch marks on *E. tereticornis* within the Ellensfield Offset Area

Table 11: Koala Offset Assessment Guide - Wynette Offset Area

Aspect	Input	Justification
Conservation Status	Vulnerable	EPBC Act Listing Status
Stage 1 Impacted habitat (ha)	78.2	There is 78.2 ha of habitat for the Koala in the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	6	Native vegetation within the Project Area has largely been historically cleared in favour of pastureland. Remaining contiguous patches of remnant eucalypt woodland are mainly restricted to the riparian areas outside of the disturbance area. The habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). The presence of wild dogs recorded within the Study Area decreases the suitability of fragmented habitat as does the absence of connectivity/movement corridors. Koala food trees within a fragmented landscape are of minimal value to koalas if the food trees are inaccessible.
Offset Area	Wynette	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the offset area.
Time until ecological benefit	20 years	Managing the threatening processes affecting the koala habitat quality is expected to improve the quality and composition of habitat for the koala as described below under 'future quality with offset'. It is considered that the ecological benefit (future quality described below) is likely to occur within 20 years.
Start area (ha) (size of the offset)	285	The Stage 1 impact is being offset with 285 ha of koala habitat available within the Wynette Offset Area.
Start Quality (0 to 10)	6	The start quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A).). Habitat varied in condition, comprising of remnant and mature regrowth. The remnant vegetation communities were typically in better condition with comparable structure and species diversity to the associated RE benchmarks. The Koala habitat Wynette Offset Area comprises 18 ha of mature regrowth vegetation. Evidence of pest fauna (e.g. scat and tracks), including wild dogs were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021).
Risk of loss (%) without offset	0.42	In accordance with the 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (Maseyk et al., 2017), an annual risk of loss of 0.42% for the Isaac Regional Council area has been applied.



Aspect	Input	Justification
Future quality without offset (scale of 0-10)	5	Clearing and degradation of koala habitat (and subsequent habitat fragmentation) and encounter mortality with wild dogs are two key threats to Koalas (Department of Agriculture, Water and the Environment, 2022a). Without the offset the non-remnant areas will continue to be periodically cleared (or treated with chemical pellets) to maintain the agricultural production of the area. As stated above, evidence of pest fauna (e.g. scat and tracks), including wild dogs were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021). Without the offset, the koala habitat quality within the Wynette Offset Area is expected to degrade due to habitat fragmentation from the clearance of non-remnant vegetation in the surrounding landscape and continued threats associated with wild dogs. Further to the above, inappropriate livestock grazing pressures can facilitate the spread of environmental weeds and non-native pasture grasses, reducing the recruitment and abundance of native species within the ground layer (Kutt & Fisher, 2011). Proliferation of environmental weeds, particularly <i>Cryptostegia grandiflora</i> (rubber vine) and lantana (<i>Lantana camara</i>), along riparian corridors can further degrade riparian vegetation and forms dense, sometimes impenetrable, thickets, reducing the habitat quality and impeding movement for native fauna (DAF, 2020). The future quality without the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover • shrub cover • recruitment; and • coarse woody debris. Also, there was consideration of factors not assessed in the methods (i.e. the potential effects of feral species and habitat degradation from ongoing management [clearance/chemical treatment] of regrowth).
Risk of loss (%) with offset	0	Within the next 20 years, with the offset, there is a 0% risk that the ecological values would be lost.



Aspect	Input	Justification
Future quality with offset (scale of 0-10)	7	The future quality of the koala habitat is expected to increase in the Wynette Offset Area as the threatening factors hindering the current habitat value (e.g. habitat fragmentation and wild dogs) would be managed and the regrowth (non-remnant) would further mature. Wild dogs would be controlled as part of the pest animal control programme. In addition to management of wild dogs in the offset areas, as part of the Project, feral animal control strategies (e.g. baiting, trapping) would be implemented in the MLAs to maintain low abundance of feral animals. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires. The future quality with the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover; and • shrub cover. Also, there was consideration of factors not assessed in the methods (i.e. management of feral species, retention of regrowth and improved fire management).
Confidence in the result (%)	85	There is a high level of confidence that loss of habitat values in the Wynette Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The Wynette property is freehold land owned by Whitehaven WS and as a result, there is certainty regarding the management commitments (Section 2.5). The methods proposed to enhance koala habitat quality (Section 2.5) are consistent with the approved conservation advice (DSEWPAC, 2012c).
Calculator Output - % of Impact Offset	100.52	



3.5 Greater glider

Residual impacts on greater glider habitat within Stage 1 of the Impact Area are proposed to be offset partially (42.57%) using 65 ha in the Wynette Offset Area (Table 12) (Figure 15), with the remaining proportion offset using 88.66 ha in the Ellensfield Offset Area (Table 13) (Figure 20).

Within the Wynette Study Area, four greater glider observations were recorded during the dry season field survey while spotlighting within eucalypt woodlands on alluvial soils (Figure 15). Several historic records for the species, including those recorded during ecological surveys for the Winchester South Project (E2M, 2021), are also located within proximity to the Wynette Study Area in association with the Isaac River corridor.

Greater glider habitat is largely restricted to eucalypt forests and woodlands. The species diet comprises mostly eucalypt leaves and sometimes eucalypt flowers (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2022a). During the day, greater gliders shelter in large tree hollows and a strong correlation exists between the number of large hollows abundance and the number of greater gliders (Andrews et al., 1994). They are typically found at their highest abundance in montane, moist eucalypt forests that are mature and have large trees with hollows (DCCEEW, 2022). The greater glider also favours a diverse range of eucalypt species within their local range because of variability in food preference across seasons (Kavanagh, 1984).

Suitable habitat for the species within the Wynette Study Area was observed in association with eucalypt dominated woodlands containing large hollows (Plate 4). Greater glider habitat is mapped within the Wynette Study Area as remnant REs with low fragmentation and high abundances of hollow bearing trees (REs 11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3. and 11.5.17) and equates to a total of approximately 228.03 ha (Figure 14).

Greater gliders were observed within the Ellensfield Study Area during the May 2021 field survey.

Diurnal habitat assessments within the Ellensfield Study Area identified suitable greater glider habitat in eucalypt dominated riparian woodlands along Carborough Creek. These areas typically contained plentiful medium to large hollows and feed tree species associated along and surrounding the watercourses. One greater glider was recorded within very close proximity (45m) to the Ellensfield Study Area and two additional greater gliders were observed approximately 500 m outside the Ellensfield Study Area within the Ellensfield Investigation Area (Figure 8). The Ellensfield Investigation Area is well connected through contiguous vegetation and watercourses which link/connect to habitat within the Ellensfield Study Area. The Ellensfield Study Area contains approximately 88.66 ha of greater glider habitat within remnant REs 11.3.4 and 11.3.25 (Figure 8).





Plate 4. Greater glider habitat within the Wynette Offset Area

Table 12: Greater Glider Offset Assessment Guide - Wynette Offset Area

Aspect	Input	Justification
Conservation Status	Vulnerable	EPBC Act Listing Status
Stage 1 Impacted habitat (ha)	42.1	There is 42.1 ha of habitat for the greater glider in the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	6	The habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021).
Offset Area	Wynette	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the Wynette Offset Area.
Time until ecological benefit	20 years	Managing the threatening processes affecting the greater glider habitat quality is expected to improve the quality and composition of habitat for the greater glider as described below under 'future quality with offset'. It is considered that the ecological benefit (future quality described below) is likely to occur within 20 years.
Start area (ha) (size of the offset)	65	The Stage 1 impact is being offset with 65 ha of greater glider habitat within the Wynette Offset Area.



Aspect	Input	Justification
Start Quality (0 to 10)	6	The start quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). Within the Wynette Offset Area, four greater glider observations were recorded during the dry season field survey while spotlighting within eucalypt woodlands on alluvial soils (Figure 15). Several historic records for the species, including those recorded during ecological surveys for the Winchester South Project (E2M, 2021), are also located within proximity to the Wynette Offset Area in association with the Isaac River corridor. Evidence of pest fauna (e.g. scat and tracks), including feral cats were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021). A number of existing fence-lines utilising barbed wire traverse the Wynette Offset Area and pose a threat to native fauna species, particularly greater gliders, that can become entangled.
Risk of loss (%) without offset	0.42	In accordance with the 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (Maseyk et al. 2017), an annual risk of loss of 0.42% for the Isaac Regional Council area has been applied.
Future quality without offset (scale of 0-10)	5	Without the offset, the greater glider habitat quality within the Wynette Offset Area is expected to decrease due to ongoing recognised threats including, habitat fragmentation through clearance of non-remnant vegetation, no specific fire management programme, barb-wire fencing and predation by feral cats. Without the offset the non-remnant areas will continue to be periodically cleared (or treated with chemical pellets) to maintain the agricultural production of the area. As stated above, evidence of pest fauna (e.g. scat and tracks), including feral cats were observed within the Wynette Offset Area and surrounds during field surveys (E2M Pty Ltd, 2021). The future quality without the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover • shrub cover • recruitment; and • coarse woody debris. Also, there was consideration of factors not assessed in the methods (i.e. the potential effects of feral species, barb-wire fencing and habitat degradation from ongoing management [clearance/chemical treatment] of regrowth). High severity bushfires is a recognised risk to this species (DCCEE, 2022).
Risk of loss (%) with offset	0	Within the next 20 years, with the offset, there is a 0% risk that the ecological values would be lost.



Aspect	Input	Justification
Future quality with offset (scale of 0-10)	7	The future quality of greater glider habitat is expected to increase in the Wynette Offset Area as the threatening factors hindering the current habitat value would be managed. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires, a recognised risk to this species (DCCEEW, 2022). Barbed wire fencing within and surrounding the offset areas (that presents a risk of entanglement, a recognised risk to this species [DCCEEW, 2022]) would be modified so the top strand is plain wire fencing. Whitehaven WS would implement a Greater Glider Nest Box Programme, including installation and maintenance of 30 nest boxes designed specifically for the Greater Glider. Monitoring would occur using Smart Nest Box principles (i.e. boxes fitted with video/audio data collection capability). Feral cats would be controlled as part of the pest animal control programme. The future quality with the offset score has been informed by adjusting the following values in the Queensland Habitat Quality Assessment Method (DES, 2021): • ground cover (forb, grass species richness and cover) • non-native cover; and • shrub cover. Also, there was consideration of factors not assessed in the methods (i.e. improved fire management, removal of barbed wire, addition of nest boxes, management of feral species and retention of regrowth).
Confidence in the result (%)	85	There is a high level of confidence that loss of habitat values in the Wynette Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The Wynette property is freehold land owned by Whitehaven WS and as a result, there is certainty regarding the management commitments (Section 2.5). The methods proposed to enhance greater glider habitat quality (Section 2.5) are consistent with the approved conservation advice (TSSC, 2016).
Calculator Output - % of Impact Offset	42.58	



Table 13: Greater Glider Offset Assessment Guide - Ellensfield Offset Area

Aspect	Input	Justification
Conservation Status	Vulnerable	EPBC Act Listing Status
Impacted habitat (ha)	42.1	There is 42.1 ha of habitat for the greater glider in the Project Stage 1 Impact Area (E2M, 2021).
Winchester South habitat quality (0-10)	6	The habitat quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A).
Offset Area	Ellensfield	-
Time over which loss is averted (max. 20 years)	20 years	An arrangement would be made for the protection and management of the Ellensfield Offset Area.
Time until ecological benefit	20 years	Managing the threatening processes affecting the greater glider habitat quality (habitat fragmentation [TSSC, 2016]) is expected to improve the quality and composition of habitat for the greater glider as described below under 'future quality with offset'. It is considered that the ecological benefit (future quality described below) is likely to occur within 20 years.
Start area (ha) (Size of the offset)	88.66	There is 88.66 ha of potential greater glider habitat within the Ellensfield Offset Area.
Start Quality (0 to 10)	6	The start quality score has been calculated using the Queensland Habitat Quality Assessment Method (DES, 2021) (Appendix A). A number of feral pests, including wild dogs, cats and pigs have been previously recorded in proximity to the Ellensfield Offset Area (DES, 2022). A number of existing fence-lines utilising barbed wire traverse the Ellensfield Offset Area and pose a threat to native fauna species, particularly greater gliders, that can become entangled.
Risk of loss (%) without offset	0.42	In accordance with the 'Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act' (Maseyk et al. 2017), an annual risk of loss of 0.42% for the Isaac Regional Council area has been applied.
Future quality without offset (scale of 0-10)	5	Without the offset, the greater glider habitat quality within the Ellensfield Offset Area is expected to decrease due to ongoing recognised threats including, no specific fire management programme, barb-wire fencing and predation by feral cats. As stated above, a number of feral pests, including wild dogs, cats and pigs have been previously recorded in proximity to the Ellensfield Offset Area (DES, 2022). The future quality without the offset score has been informed by adjusting values in the Queensland Habitat Quality Assessment Method (DES, 2021) and by considering factors not assessed in the methods (i.e. the potential effects of feral species and barb-wire). High severity bushfires is a recognised risk to this species (DCCEEW, 2022).
Risk of loss (%) with offset	0	Within the next 20 years, with the offset, there is a 0% risk that the ecological values would be lost.



Aspect	Input	Justification
Future quality with offset (scale of 0-10)	7	The future quality of the greater glider habitat is expected to increase in the Ellensfield Offset Area as the threatening factors hindering the current habitat value would be managed. A fire management programme would be implemented in the offset area to avoid the risk of high severity bushfires, a recognised risk to this species (DCCEEW, 2022). Barbed wire fencing within and surrounding the offset areas (that presents a risk of entanglement, a recognised risk to this species [DCCEEW, 2022]) would be modified so the top strand is plain wire fencing. Whitehaven WS would implement a Greater Glider Nest Box Programme, including installation and maintenance of 30 nest boxes designed specifically for the Greater Glider. Monitoring would occur using Smart Nest Box principles (i.e. boxes fitted with video/audio data collection capability). Feral cats would be controlled as part of the pest animal control programme. The future quality with the offset score has been informed by adjusting ground cover values in the Queensland Habitat Quality Assessment Method (DES, 2021) and by considering factors not assessed in the methods (i.e. improved fire management, removal of barbed wire, addition of nest boxes, management of feral species and retention of regrowth).
Confidence in the result (%)	85	There is a high level of confidence that loss of habitat values in the Ellensfield Offset Area would be averted because an arrangement would be made for the protection and management of the offset area. The methods proposed to enhance greater glider habitat quality (Section 2.5) are consistent with the approved conservation advice (DCCEEW, 2022).
Calculator Output - % of Impact Offset	58.08	



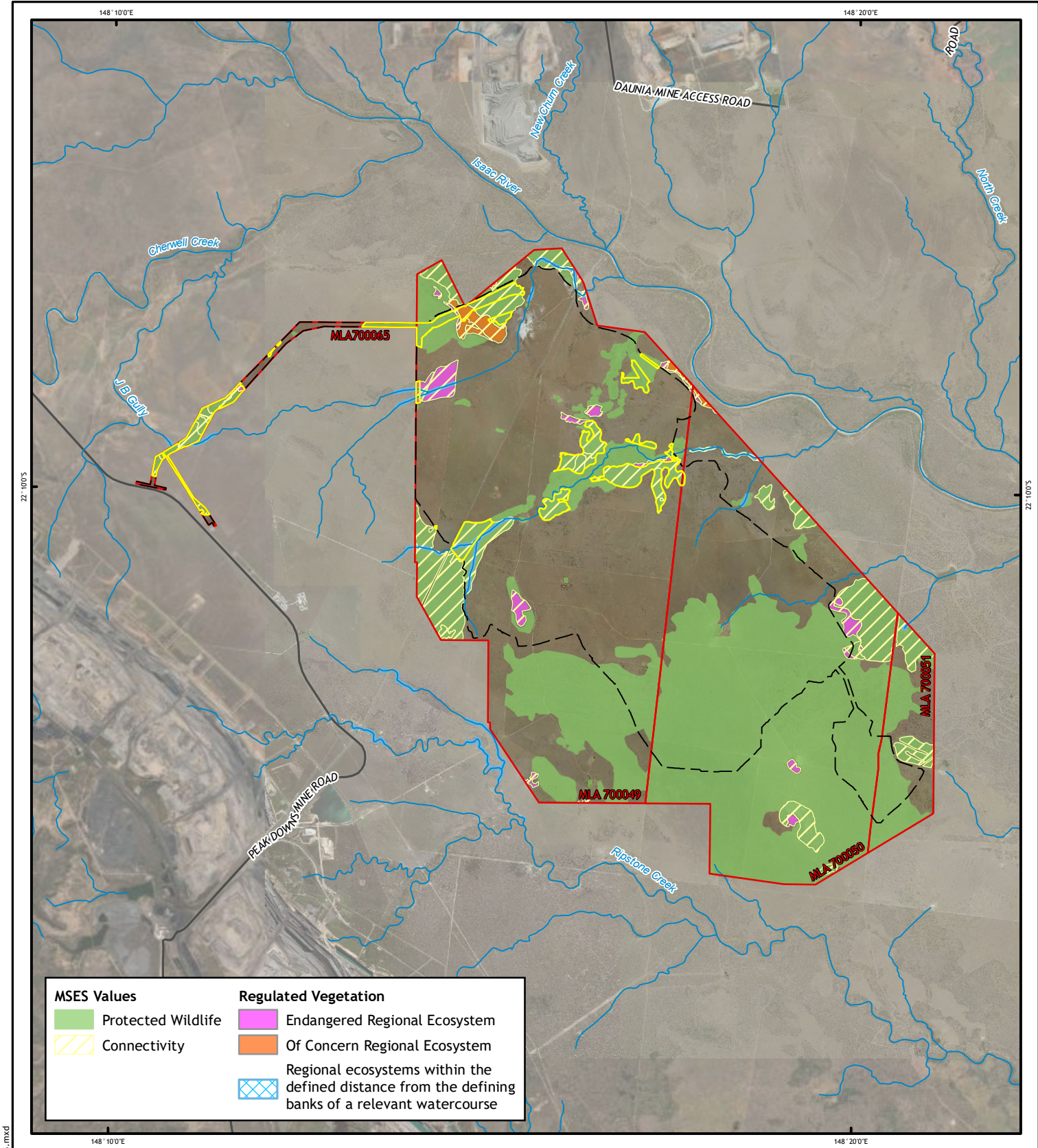
4 Stage 1 Matters of State Environmental Significance

Offsets may be required for activities where there is an unavoidable impact on significant environmental values to counterbalance the loss in the impact area. The *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021b) is used to assess the MSES offset requirement for a significant residual impact on a prescribed environmental matter which is set at a maximum multiplier of 4 (i.e. a maximum of four times the area of the significant residual impact), with the exception of impacts to connectivity, for which the offset requirement is set at a multiplier of 1. MSES within the Project are shown on Figure 22 and MSES present in the Offset Areas are shown on Figures 23 to 25. Table 14 provides a summary of the MSES areas and percentage from each of the Offset Areas for the Stage 1 impact areas.

Table 14: Summary of the MSES Areas required on each of the Offset Areas for the Stage 1 Impacts

MNES		Stage 1 Clearance	Wynette Offset	Ellensfield Offset	Inderi Offset	Offset Total
Regulated Vegetation - Endangered Regional Ecosystem						
RE 11.3.1 (BVG 25a)	area (ha)	5	20 ha (15.63 ha of 11.3.1, 4.37 ha of 11.4.8)	0	0	20
	% of offset		100	0	0	100
RE 11.4.9 (BVG 25a)	area (ha)	1.1	4.4 ha (4.16 ha of 11.4.9, 0.24 ha of 11.4.8)	0	0	4.4
	% of offset		100	0	0	100
RE 11.9.5 (BVG 25a)	area (ha)	2.4	4.73 ha of 11.4.8	4.87 ha of 11.9.5	0	9.6
	% of offset		49.27	50.73	0	100
Regulated Vegetation - Of Concern Regional Ecosystem						
RE 11.3.4 (BVG 16c)	area (ha)	8.8	35.2 ha (3.55 ha of 11.3.3, 31.65 ha of 11.3.4)	0	0	35.2
	% of offset		100	0	0	100
Regulated Vegetation - Regional Ecosystems within the Defined Distance of a Vegetation Management Watercourse						
RE 11.3.1 (BVG 25a)	area (ha)	0.2	0.8 ha of 11.3.1	0	0	0.8
	% of offset		100	0	0	100
RE 11.9.3 (BVG 30b)	area (ha)	0.7	0	0	2.8 ha of 11.8.11	2.8
	% of offset		0	0	100	100
Connectivity						
Connectivity	area (ha)	324.3 (remnant)	71.49 (non-remnant)	6.24 (non-remnant)	246.57 (non-remnant)	324.3
	% of offset		22.04	1.93	76.03	100





Legend

- Seasonal Watercourse / Drainage Feature
- Road
- Mining Lease Application Boundary
- Indicative Surface Disturbance Extent
- MNES or MSES Significant Area Impacted by Stage 1

Scale 1:120,000 (A4)

0 2 4 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

Notes:
Aerial Imagery: © DNRME 2018, Whitehaven 2019
Watercourse: Regulated vegetation - intersecting a watercourse © DNRME 2019
Road: © PSMA 2014
Cadastre: © DNRME 2019

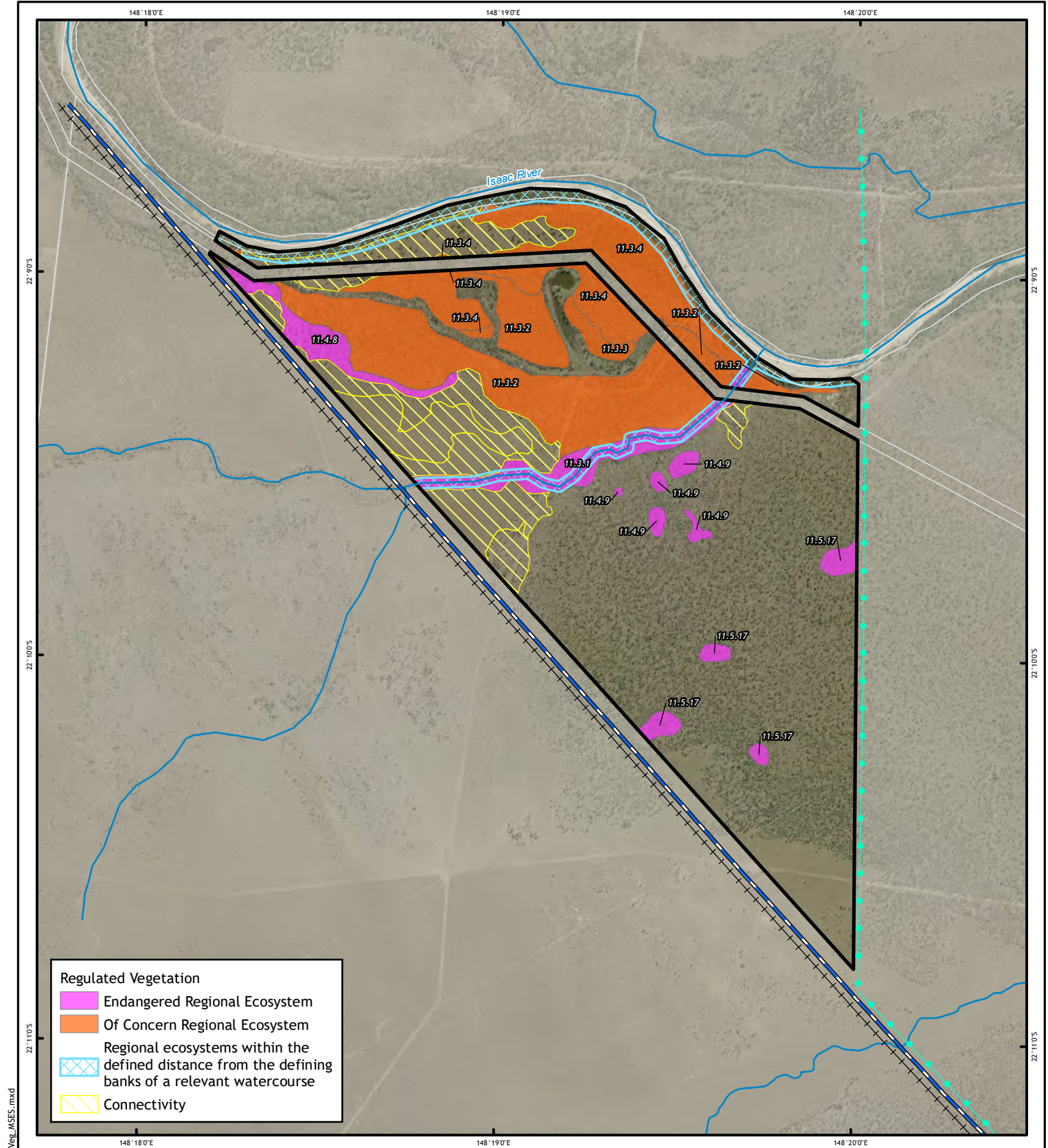
6	Issued for Use	DL	BD	07/10/2022
Rev	Description	Drawn	Approved	Date

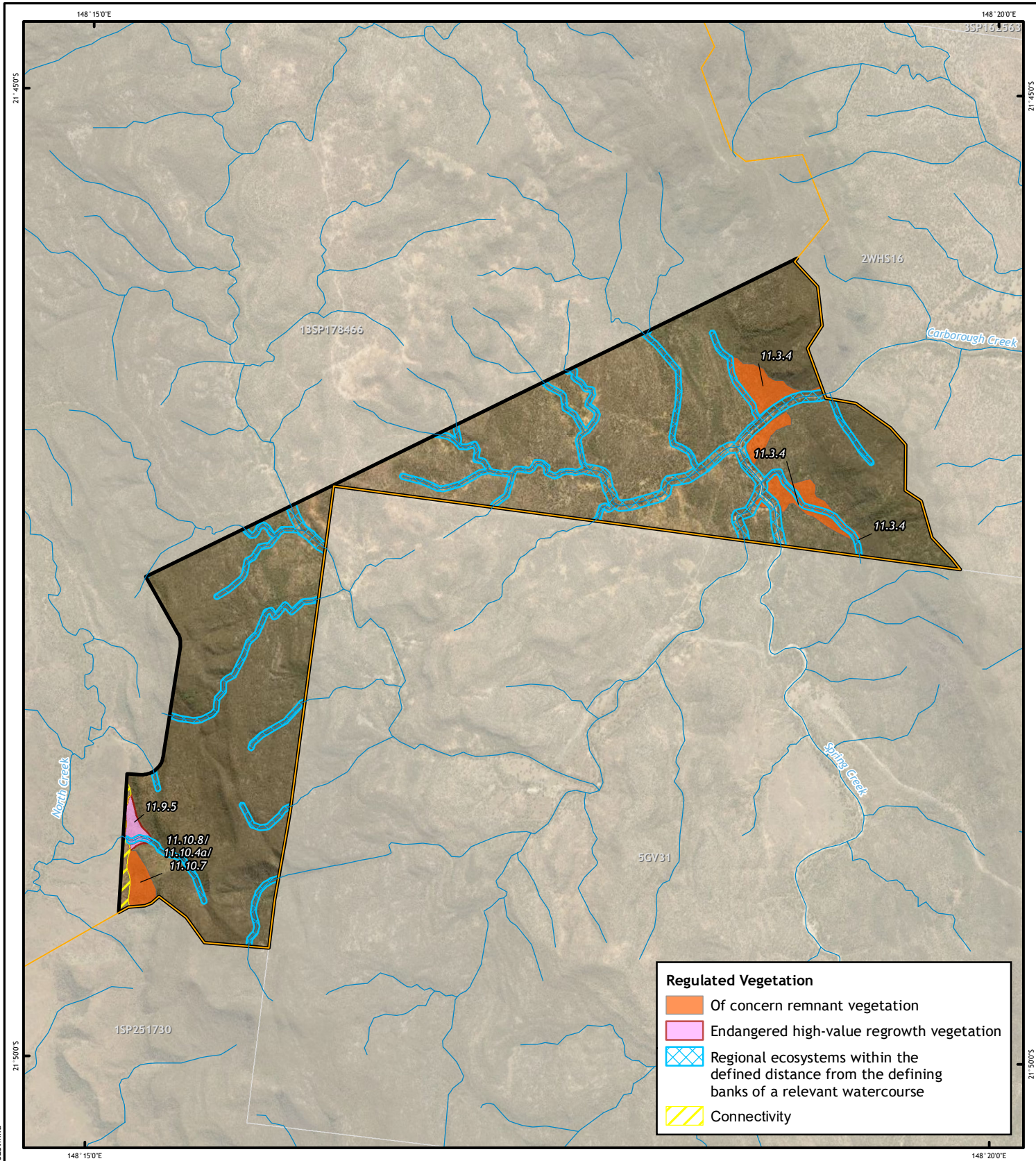
FIGURE 22: IMPACT AREA - MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number 1 of 1	Job Number QEJ20054	Rev 6
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Legend

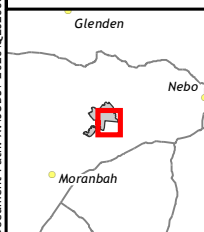
- Seasonal Watercourse / Drainage Feature
- Cadastre
- Ellensfield Property Boundary
- Ellensfield Offset Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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Cadastre: © DOR 2021
Watercourse: © Geoscience Australia

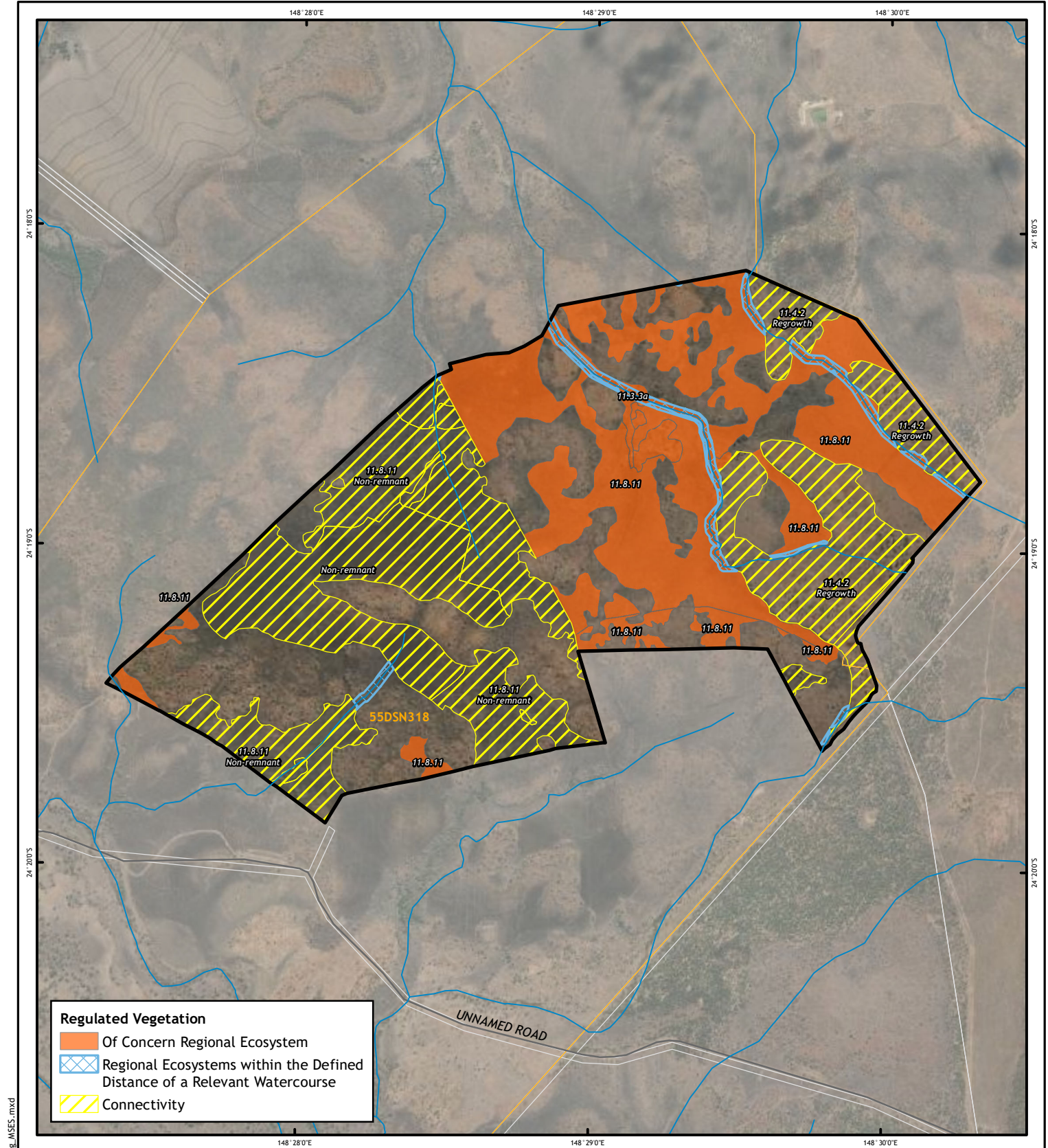
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FIGURE 24: ELLENSFIELD OFFSET AREA - MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

Stage 1 Offset Area Assessment Report WHITEHAVEN COAL

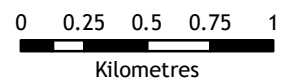
Map Number	Job Number	Rev
1 of 1	QEJ20054	6



- Legend**
- Road
 - Seasonal Watercourse / Drainage Feature
 - Cadastre
 - Inderi Property Boundary
 - Inderi Offset Area



Scale 1:30,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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FIGURE 25: INDERI OFFSET AREA - MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

Stage 1 Offset Area Assessment Report
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	6

5 Stage 2 Offset

The three Offset Areas would sufficiently offset the impacts from Stage 1 of the Project on the relevant MNES and MSES as listed above and partly offset impacts from a second stage of the Project as shown below in Table 15 and Table 16.

Table 15: Summary of the MNES Areas required on each of the Offset Areas for the Stage 2 Impacts

MNES		Stage 2 Clearance	Wynette Offset	Ellensfield Offset	Total
Poplar Box TEC	area (ha)	9.6	50	0	50
	% of offset		100.69	0	100.69
ornamental snake	area (ha)	1,523.1	7.26	0	7.26
	% of offset		0.48	0	0.48
squatter pigeon (southern subspecies) breeding and foraging habitat	area (ha)	61.7	44.22	0	44.22
	% of offset		20.16	0	20.16
koala	area (ha)	90.7	116.32	215	331.32
	% of offset		35.37	65.38	100.75
greater glider	area (ha)	90.7	163.03	0	163.03
	% of offset		49.57	0	49.57

Table 16: Summary of the MSES Areas required on each of the Offset Areas for the Stage 2 Impacts

MSES		Stage 2 Clearance	Wynette Offset	Ellensfield Offset	Inderi Offset	Total
Regulated Vegetation - Endangered Regional Ecosystem						
RE 11.3.1 (BVG 25a)	area (ha)	59.5	0	0	0	0
	% of offset		0	0	0	0
RE 11.4.8 (BVG 25a)	area (ha)	2.4	0	0	0	0
	% of offset		0	0	0	0
RE 11.4.9 (BVG 25a)	area (ha)	2.6	0	0	0	0
	% of offset		0	0	0	0
RE 11.9.5 (BVG 25a)	area (ha)	15.3	0	0	0	0
	% of offset		0	0	0	0
Regulated Vegetation - Of Concern Regional Ecosystem						
RE 11.3.3c (BVG 16c)	area (ha)	6.9	4.81 ha of 11.3.4	22.79 ha of 11.3.4	0	27.6



MSES		Stage 2 Clearance	Wynette Offset	Ellensfield Offset	Inderi Offset	Total
	% of offset		17.43	82.57	0	100
RE 11.3.4 (BVG 16c)	area (ha)	31	0	24.64 ha of 11.3.4	0	24.64
	% of offset		0	19.87	0	19.87
Regulated Vegetation - Regional Ecosystems within the Defined Distance of a Vegetation Management Watercourse						
RE 11.3.1 (BVG 25a)	area (ha)	1.1	4.4	0	0	4.4
	% of offset		100	0	0	100
RE 11.9.3 (BVG 30b)	area (ha)	2.4	0	0	6.35	6.35
	% of offset		0	0	66.14	66.14
Protected Wildlife Habitat						
<i>Solanum adenophorum</i>	area (ha)	0.2	0.8	0	0	0.8
	% of offset		100	0	0	100
Connectivity						
Connectivity	area (ha)	225.6 (remnant)	0	0	7.8 (non-remnant)	7.8
	% of offset		0	0	3.46	3.46



6 Conclusion

This document provides details of how the environmental offset/s for Stage 1 meets the requirements of the EPBC Act *Environmental Offsets Policy 2012* (DSEWPaC, 2012), including the *EPBC Act Offsets Assessments Guide* (DSEWPaC, 2012b) and the *Queensland Environmental Offsets Policy (Version 1.11)* (DES, 2021).

In conclusion, the three Offset Areas would sufficiently offset the impacts from Stage 1 of the Project on the relevant MNES and MSES listed above and partly offset impacts from a second stage of the Project. The future quality of the MNES habitat and MSES regulated vegetation and connectivity in the Offset Areas would be increased over time through implementation of management measures relevant to each matter.



7 References

- Andrews, S. P., Gration, G., Quin, D., & Smith, A. P. (1994). *Description and assessment of forestry impacts on fauna of the Urbenville Forestry Management Area. Report for State Forests of New South Wales.*
- Australian Koala Federation (AKF). (2015). *Australian Koala Foundation National Koala Tree Planting List.* Australian Koala Federation.
- Bureau of Meteorology. (2022). *Climate Data Online.* <http://www.bom.gov.au/climate/data/>
- Bureau of Meteorology (BoM). (2020). *Groundwater Dependent Ecosystems Atlas [Map].* Bureau of Meteorology.
- Conservation Advice for Petauroides volans (greater glider (southern and central)).* (2022). <http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-05072022.pdf>
- Cropper, S. (1993). *Management of Endangered Plants.* CSIRO Publishing.
- Department of Agriculture and Fisheries (DAF). (2020). *Restricted Invasive Plant: Rubber Vine—Cryptostegia grandiflora and Cryptostegia madagascariensis.* Queensland Government.
- Department of Agriculture and Fisheries (DAF). (2022). *Restricted Invasive Plant: Parthenium—Parthenium hysterophorus.* Queensland Government.
- Department of Agriculture, Water and the Environment. (2021). *Draft National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory).* Australian Government.
- Department of Agriculture, Water and the Environment. (2022a). *Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory.* Department of Agriculture, Water and Environment.
- Department of Agriculture, Water and the Environment. (2022b). *Species Profile and Threats Database.* <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2022a). *Approved Conservation Advice for Petauroides volans (greater glider (southern and central)).* Department of Climate Change, Energy, the Environment and Water.
- Department of Climate Change, Energy, the Environment and Water (DCCEEW). (2022b). *Species Profiles and Threats Database.* Species Profile and Threats Database. <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Department of Environment and Resource Management (DERM). (2011). *Managing Grazing Lands in Queensland.* Department of Environment and Resource Management.
- Department of Environment and Science. (2020). *Flora Survey Guidelines—Protected Plants.* State of Queensland.
- Department of Environment and Science. (2021a). *Map of Queensland Wetland Environmental Values [Map].* Department of Environment and Science.



- Department of Environment and Science. (2021b). *Queensland Environmental Offsets Policy (Version 1.10)*. Department of Environment and Science.
- Department of Environment and Science (DES). (2018a). *Regional Ecosystem Technical Descriptions for the Brigalow Belt Bioregion*. Queensland Government.
<https://www.publications.qld.gov.au/dataset/re-technical-descriptions>
- Department of Environment and Science (DES). (2018b). *WildNet wildlife records* [Dataset]. Department of Environment and Science.
- Department of Environment and Science (DES). (2021). *Guide to determining terrestrial habitat quality (Version 1.3): Methods for assessing habitat quality under the Queensland Environmental Offsets Policy*. Department of Environment and Science.
- Department of Environment and Science (DES). (2022). *Wildlife Online Extract*.
<https://apps.des.qld.gov.au/report-request/species-list/>
- Department of Sustainability, Environment, Water, Population and Communities. (2011a). *Draft referral guidelines for the nationally listed Brigalow Belt reptiles*. Australian Government.
<https://www.awe.gov.au/sites/default/files/documents/draft-referral-guidelines-comment-brigalow-reptiles.pdf>
- Department of Sustainability, Environment, Water, Population and Communities. (2011b). *Survey guidelines for Australia's threatened mammals*. Australian Government.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC). (2012a). *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy*. Department of Sustainability, Environment, Water, Population and Communities.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC). (2012b). *Offsets Assessment Guide*. Commonwealth of Australia.
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC). (2012c). *Approved Conservation Advice for Phascolarctos cinereus (combined populations in Queensland, New South Wales and the Australian Capital Territory)*. Department of Sustainability, Environment, Water, Population and Communities.
- Department of the Environment. (2014a). *EPBC Act referral guidelines for the vulnerable koala*. Australian Government. <https://www.environment.gov.au/system/files/resources/dc2ae592-ff25-4e2c-ada3-843e4dea1dae/files/koala-referral-guidelines.pdf>
- Department of the Environment. (2014b). *Approved Conservation Advice for Denisonia maculata (Ornamental Snake)*.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-advice.pdf>
- Department of the Environment and Energy (DEE). (2016). *Threat Abatement Plan for Competition and Land Degradation by Rabbits*. Department of the Environment and Energy.
- Department of the Environment and Heritage. (2005). *Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs*. Department of the Environment and Heritage.
- Department of the Environment (DoE). (2015). *Threat Abatement Plan for Predation by Feral Cats*. Department of the Environment.



- Department of the Environment, Water, Heritage and the Arts. (2010). *Survey guidelines for Australia's threatened birds*. Australian Government.
<https://www.awe.gov.au/sites/default/files/documents/survey-guidelines-birds-april-2017.pdf>
- Department of the Environment, Water, Heritage and the Arts (DEWHA). (2008). *Threat Abatement Plan for Predation by the European Fox*. Department of the Environment, Water, Heritage and the Arts.
- DEWHA. (2014). *Approved Conservation Advice for Denisonia maculata (Ornamental Snake)*.
<http://www.environment.gov.au/biodiversity/threatened/species/pubs/1193-conservation-advice.pdf>
- Doody, T. M., Hancock, P. J., & Prichard, J. L. (2019). *Information Guidelines explanatory note: Assessing groundwater-dependent ecosystems*. Department of Environment and Energy.
- DPM Envirosiences. (2018). *Olive Downs Coking Coal Project—Terrestrial fauna assessment*. Prepared for Pembroke.
- E2M. (2021). *Winchester South Project: Terrestrial Ecology Assessment*. E2M Pty Ltd.
- E2M Pty Ltd. (2021). *Winchester South Project: Terrestrial Ecology Assessment*. E2M Pty Ltd.
- E2M Pty Ltd (E2M). (2022a). *Baseline Assessment Report for Wynette North and Inderi*.
- E2M Pty Ltd (E2M). (2022b). *Ellensfield Baseline Offset Assessment Report*.
- Ellis, W., FitzGibbon, S., Gillett, A., Hulse, L., & Barth, B. (2018). *Queensland Trust for Nature Koala Project*. The University of Queensland.
- Eyre, T. J., Ferguson, D. J., Hourigan, C. L., Smith, G. C., Mathieson, M. T., Kelly, A. L., Venz, M. F., Hogan, L. D., & Rowland, J. (2018). *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland*. Department of Environment and Science.
- Kath, J., Reardon-Smith, K., Le Brocq, A., Dyer, F., Dafny, E., Fritz, L., & Batterham, M. (2014). Groundwater Decline and Tree Change in Floodplain Landscapes: Identifying Non-linear Responses in Canopy Condition. *Global Ecology and Conservation*, 2, 148-160.
- Kavanagh, R. P. (1984). Seasonal changes in habitat use by gliders and possums in southeastern New South Wales. In *Possums and Gliders* (pp. 527-543). Surrey Beatty and Sons.
- Kutt, A., & Fisher, A. (2011). Increased grazing and dominance of an exotic pasture (*Bothriochloa pertusa*) affects vertebrate fauna species composition, abundance and habitat in savanna woodland. *The Rangeland Journal*, 33, 49-58.
- Langford, C. M. (2005). Managing Native Pasture for Agriculture and Conservation. In *Grassland Conservation and Production Both Sides of the Fence. Proceedings of Fourth Stipa Conference on Management of Native Grasses and Pastures*. University of Melbourne.
- Maseyk, F., Evans, M., & Maron, M. (2017). *Guidance for deriving "Risk of Loss" estimates when evaluating biodiversity offset proposals under the EPBC Act*. The University of Queensland.
- Melzer, A., Cristescu, R., Ellis, W., FitzGibbon, S., & Manno, G. (2014). The habitat and diet of koalas (*Phascolarctos cinereus*) in Queensland. *Australian Mammalogy*, 36(2), 189-199.



- Neldner, V. J., Wilson, B. A., Dillewaard, H. A., Ryan, T. S., Butler, D. W., McDonald, W. J. F., Richter, D., Addicott, E. P., & Appelman, C. N. (2022). *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland v.6.0*. Queensland Herbarium, Queensland Department of Environment and Science.
- Orellana, F. A., Verma, P., Loheide, S. P., & Daly, E. (2012). Monitoring and modeling water-vegetation interactions in groundwater-dependent ecosystems. *Reviews of Geophysics*, 50, 1-24.
- Pembroke Olive Downs Pty Ltd. (2018). *Olive Downs Coking Coal Project—Environmental Impact Statement*. Pembroke Olive Downs Pty Ltd.
- Phillips, S., & Callaghan, J. (2011). The Spot Assessment Technique: A tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus*. *Australian Zoologist*, 35(3), 774-779.
- Queensland Herbarium. (2021). *BioCondition Benchmark Database (Version 3.2)*. Department of Environment and Science.
- SLR Consulting Australia Pty Ltd. (2021). *Winchester South Project EIS: Groundwater Impact Assessment*. SLR Consulting Australia Pty Ltd.
- Souther, S., Loeser, M., Crews, T. E., & Sisk, T. (2020). Drought exacerbates negative consequences of high-intensity cattle grazing in a semiarid grassland. *Ecological Applications*, 30(3), e02048.
- Squatter Pigeon Workshop. (2011). *Proceedings from the workshop for the Squatter Pigeon (southern)*. 14-15 December 2011. Toowoomba Office of the Queensland Parks and Wildlife Service.
- Threatened Species Scientific Committee. (2015). *Approved Conservation Advice for Geophaps scripta scripta (Squatter Pigeon (southern))*. Department of the Environment.
- Threatened Species Scientific Committee (TSSC). (2009). *Commonwealth Listing Advice on Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin*. Department of the Environment, Water Heritage and the Arts (DEWHA).





Appendix A Habitat Quality Data

Habitat Quality Assessment Summary for the Project Area

Matter	AU	RE	Weighted BioCondition Score	BioCondition Score	Fauna Species Habitat Score
Natural Grasslands TEC	8	11.4.4 Remnant	2.93	5.60	N/A
	17	11.9.3 Remnant	2.67		
Poplar Box TEC	3	11.3.2 Remnant	6.94	6.94	N/A
ornamental snake	1	11.3.1 Remnant	0.2	3.85	6.77
	2	11.3.1 Regrowth	0.02		
	5	11.3.3c Remnant	0.03		
	9	11.4.8 Remnant	0.01		
	10b	11.4.8 Regrowth	3.58		
	11	11.4.9 Remnant	0.01		
koala	3	11.3.2 Remnant	0.2	5.77	7.00
	5	11.3.3c Remnant	0.14		
	6	11.3.4 Remnant	0.69		
	12	11.5.3 Remnant	1.99		
	13	11.9.2 Remnant	2.72		
greater glider	3	11.3.2 Remnant	0.4	6.07	8.75
	5	11.3.3c Remnant	0.27		
	6	11.3.4 Remnant	1.4		
	12	11.5.3 Remnant	4		
squatter pigeon (southern subspecies)	12	11.5.3 Remnant	2.58	5.70	7.63
	13	11.5.3 Regrowth	0.76		
	15	11.9.2 Remnant	2.37		



Habitat Quality Assessment Summary for the Offset Areas

MNES	Wynette			Ellensfield			Inderi		
	Habitat Area (ha)	BioCondition Score	Fauna Species Habitat Score	Habitat Area (ha)	BioCondition Score	Fauna Species Habitat Score	Habitat area (ha)	BioCondition Score	Fauna Species Habitat Score
Natural Grasslands TEC	0	n/a	n/a	0	n/a	n/a	227.74	4	n/a
ornamental snake	70.76	4	5	0	n/a	n/a	0	n/a	n/a
squatter pigeon (southern) (breeding and foraging habitat)	236.23	6	7	0	n/a	n/a	0	n/a	n/a
koala	407.91	6	7	1,318.16	6	7	0	n/a	n/a
greater glider (southern and central)	216.45	6	8	88.66	6	6	0	n/a	n/a



APPENDIX B. BASELINE ASSESSMENT REPORT FOR WYNETTE AND INDERI



Baseline Assessment Report for Wynette North and Inderi



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Appendices

Appendix A.1. Inderi Study Area Database Search Results
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Appendix C. Wynette North Study Area Fauna Species-based Attribute Scores



Definitions

Term	Definition
Broad Vegetation Group	A pragmatic, higher level grouping of regional ecosystems and vegetation communities that provide an overview of the vegetation across Queensland (Neldner <i>et al.</i> , 2020). They describe major ecological patterns and relationships across Queensland, independent of bioregions and land zones, and facilitate comparisons with vegetation in other States and internationally.
Habitat Quality Score	A method of evaluating habitat quality within a particular community based on key indicators including site condition, site context and species habitat index (if necessary). The method produces a score out of 10, where the maximum score of 10 represents a fully intact system. Scores of 4, 5 and 6 may indicate good quality regrowth or medium value habitat.
Matters of National Environmental Significance	Environmental values protected under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> . Significant impacts to these values may require offsets under the legislation.
Matters of State Environmental Significance	State interests defined under Part F of the Queensland State Planning Policy and include ecological features such as Regulated Vegetation, wetlands, fish habitat areas and threatened species habitat.
Non-remnant vegetation	All vegetation that is not mapped as remnant vegetation. May include regrowth, heavily thinned or logged and significantly disturbed vegetation that fails to meet the structural and/ or floristic characteristics of remnant vegetation. It also includes urban and cropping land (Neldner <i>et al.</i> , 2020).
Regional Ecosystem	A vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil (Neldner <i>et al.</i> , 2020). Regional Ecosystems are described in the Regional Ecosystem Description Database, produced by the Queensland Herbarium.
Regrowth Vegetation	Is non-remnant vegetation that has a significant woody component but fails to meet the structural and/or floristic characteristics of remnant vegetation. Includes vegetation that has regrown after clearing or been heavily thinned or logged (Neldner <i>et al.</i> , 2020).
Regulated Vegetation	Vegetation that is mapped within the regulated vegetation management map produced by Department of Resources (formerly Department of Natural Resources, Mines and Energy). The Queensland <i>Vegetation Management Act 1999</i> is applicable to regulated vegetation.
Remnant vegetation	A regional ecosystem that has not undergone recent clearing. It is defined under the Queensland <i>Vegetation Management Act 1999</i> as: (b) forming the predominant canopy of the vegetation— (i) covering more than 50% of the undisturbed predominant canopy; and (ii) averaging more than 70% of the vegetation's undisturbed height; and (iii) composed of species characteristic of the vegetation's undisturbed predominant canopy.
Suitable habitat	A species preferred environment required to sustain a viable population. Suitable habitat may include breeding, foraging and shelter resources for fauna or preferred environmental conditions of flora.



Term	Definition
Threatened Ecological Community	An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. Threatened ecological communities are listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
Threatened species	A threatened species is any plant or animal species that is at risk of extinction. Species listed as extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) or conservation dependent (CD) under the Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i> or extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) under the Queensland <i>Nature Conservation Act 1992</i> .
Vegetation community	An area of vegetation which is relatively uniform with respect to structure and floristic composition (Neldner <i>et al.</i> , 2020).

Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia database (Queensland)
API	Aerial Photographic Interpretation
AU	Assessment Unit
BoM	Bureau of Meteorology
BVG	Broad Vegetation Group
DAWE	Commonwealth Government Department of Agriculture, Water and the Environment
DES	Queensland Department of Environment and Science
DNRME	Queensland Department of Natural Resources, Mines and Energy (now Department of Resources)
DoR	Queensland Department of Resources
DotE	Former Commonwealth Department of the Environment (now DAWE)
DSEWPac	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now Department of Agriculture, Water and the Environment)
E	Endangered
E2M	E2M Pty Ltd
EO Act	Queensland <i>Environmental Offsets Act 2014</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>



Abbreviation	Description
GIS	Geographic Information Systems
GPS	Global Positioning System
ha	Hectare
LC	Least Concern
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC	No Concern at Present
NC Act	Queensland <i>Nature Conservation Act 1992</i>
OC	Of Concern
RE	Regional Ecosystem
SO	Stream Order
sp.	Singular species. For example, <i>Eucalyptus</i> sp. refers to a single species of <i>Eucalyptus</i>
spp.	Multiple species. For example, <i>Eucalyptus</i> spp. refers to multiple species of <i>Eucalyptus</i>
SVET	Semi Evergreen Vine Thicket
TEC	Threatened Ecological Community
VM Act	Queensland <i>Vegetation Management Act 1999</i>
Whitehaven	Whitehaven WS Pty Ltd (proponent) of the Winchester South Project
WoNS	Weed of National Significance



Executive Summary

E2M Pty Ltd (E2M) was engaged by Whitehaven WS Pty Ltd (Whitehaven) to conduct ecological surveys across two separate study areas namely, Inderi (Lot 55 on Plan DSN318) and Wynette North (Lot 4 on Plan CNS15).

The purpose of these studies was to identify the presence of the following target Matters of State Environmental Significance (MSES) under the Queensland *Environmental Offsets Regulation 2014* and Matters of National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*:

- two threatened ecological communities (TECs):
 - Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC (referred to as Natural Grasslands TEC); and
 - Poplar Box Grassy Woodland on Alluvial Plains (referred to Poplar Box TEC)
- habitat for five threatened species:
 - *Solanum adenophorum*
 - koala (combined populations of Queensland, New South Wales, and the Australian Capital Territory) (*Phascolarctos cinereus*)
 - greater glider (*Petauroides volans*)
 - squatter pigeon (*Geophaps scripta scripta*); and
 - ornamental snake (*Denisonia maculata*).
- regulated vegetation (including 'endangered' and 'of concern' regional ecosystems (REs), watercourse REs and connectivity).

This report documents the terrestrial ecological values within each study area identified through desktop and field surveys. E2M completed a series of desktop assessments, to consolidate available information (e.g. environmental databases, government reports, and literature reviews of environmental documents) and field surveys, to map and record the presence of the target MNES and MSES.

Field surveys were completed by E2M during the following time periods:

- Inderi Study Area:
 - 6 to 7 May 2020 (dry season); and
 - 3 to 4 June 2020 (wet season)
- Wynette North Study Area:
 - 8 to 12 May 2020 (dry season); and
 - 19 to 23 January 2021 (wet season)

The field surveys successfully identified target MNES and MSES species across the study areas. Table ES-1 below outlines the relevant MNES/MSES identified, and the quantity of habitat present within each study area.



Table ES-1. Summary of Findings for all Relevant MNES and MSES

Environmental Matter		RE	Study Area	
			Inderi Habitat Area (ha)	Wynette North Habitat Area (ha)
MNES				
Brigalow TEC	11.3.1, 11.4.8 and 11.4.9	0	0 (26.28 ha of lower condition woodland with potential to become TEC)	
Natural Grasslands TEC	11.8.11	232.21 (plus 132.57 ha of lower condition natural grasslands with potential to become TEC)	0	
Poplar Box TEC	11.3.2	0	0 (80.37 ha of lower condition woodland with potential to become TEC)	
SEVT TEC ¹	11.5.15	0	2.53	
<i>Dichanthium queenslandicum</i>	11.8.11 and 11.8.5	519.38	0	
<i>Dichanthium setosum</i>	11.8.11 and 11.8.5	519.38	0	
koala (<i>Phascolarctos cinereus</i>)	Various	0	407.91	
greater glider (southern and central) (<i>Petauroides volans</i>)	Various	0	216.45	
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	Various	0	236.23 (breeding and foraging)	
ornamental snake (<i>Denisonia maculata</i>)	Various	0	70.76	
MSES				
Endangered RE	11.3.1 (BVG 25a)	0	15.63	
	11.4.8 (BVG 25a)	0	9.34	
	11.4.9 (BVG 25a)	0	4.16	
	11.5.17 (BVG 34d)	0	6.06	
Of Concern RE	11.3.2 (BVG 17a)	0	80.37	
	11.3.3 (BVG 16c)	0	3.55	
	11.3.3a (BVG 21b)	10.57	0	
	11.3.4 (BVG 16c)	0	36.46	

¹ Opportunistically observed during field surveys on Wynette North



Environmental Matter	RE	Study Area	
		Inderi Habitat Area (ha)	Wynette North Habitat Area (ha)
	11.8.11 (BVG 30b)	232.21	0
Watercourse RE	11.3.1 (BVG 25a)	0	9.09
	11.3.2 (BVG 17a)	0	0.22
	11.3.3a (BVG 21b)	15.66	0
	11.3.4 (BVG 16c)	0	2.09
	11.3.25 (BVG 16a)	0	14.71
	11.4.8 (BVG 25a)	0	0
	11.5.3 (BVG 17a)	0	0.05
	11.8.5 (BVG 11a)	2.66	0
	11.8.11 (BVG 30b)	9.55	0
Connectivity Area	Non-remnant associated with a RE	254.37	71.49
<i>Solanum adenophorum</i> potential habitat	11.4.9 (BVG 25a)	0	19.99

BVG = Broad Vegetation Group.



1 Introduction

1.1 Background

E2M Pty Ltd (E2M) was engaged by Whitehaven WS Pty Ltd (Whitehaven) to conduct ecological surveys of study areas within the following two freehold properties (Figure 1):

- Inderi (Lot 55 on Plan DSN318) - Freehold property - deed of grant: Fred Charles Noffke; and
- Wynette (Lot 4 on Plan CNS15) - Freehold property - deed of grant: Whitehaven.

1.2 Scope and Objectives

The objectives of the surveys were to identify the presence of the following Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES) that require offsets for the Winchester South Project and develop a baseline of Habitat Quality conditions within the study areas:

- two threatened ecological communities (TECs) listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):
 - Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC (referred to as Natural Grasslands TEC); and
 - Poplar Box Grassy Woodland on Alluvial Plains (referred to Poplar Box TEC)
- habitat for five threatened species (listed under the EPBC Act and/or the Queensland *Nature Conservation Act 1992* [NC Act]):
 - *Solanum adenophorum* (listed as Endangered under the NC Act)
 - koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) (Endangered under the EPBC Act²). Note that the koala has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral
 - greater glider (southern and central) (*Petauroides volans*) (Endangered under the EPBC Act³). Note that the greater glider has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral
 - squatter pigeon (southern subspecies) (*Geophaps scripta scripta*) (listed as Vulnerable under both the EPBC Act NC Act); and
 - ornamental snake (*Denisonia maculata*) (listed as Vulnerable under both the EPBC Act NC Act).
- regulated vegetation
 - ‘endangered’ and ‘of concern’ regional ecosystems (REs) listed under the NC Act
 - REs within the defined distance of the defining banks of a watercourse (as defined by the Queensland Environmental Offset Policy [EO Policy]), here in referred to as watercourse REs; and

² Listed as ‘Vulnerable’ under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as ‘Vulnerable’ not ‘Endangered’ (refer section 158A of the EPBC Act).

³ Listed as ‘Vulnerable’ under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as ‘Vulnerable’ not ‘Endangered’ (refer section 158A of the EPBC Act).

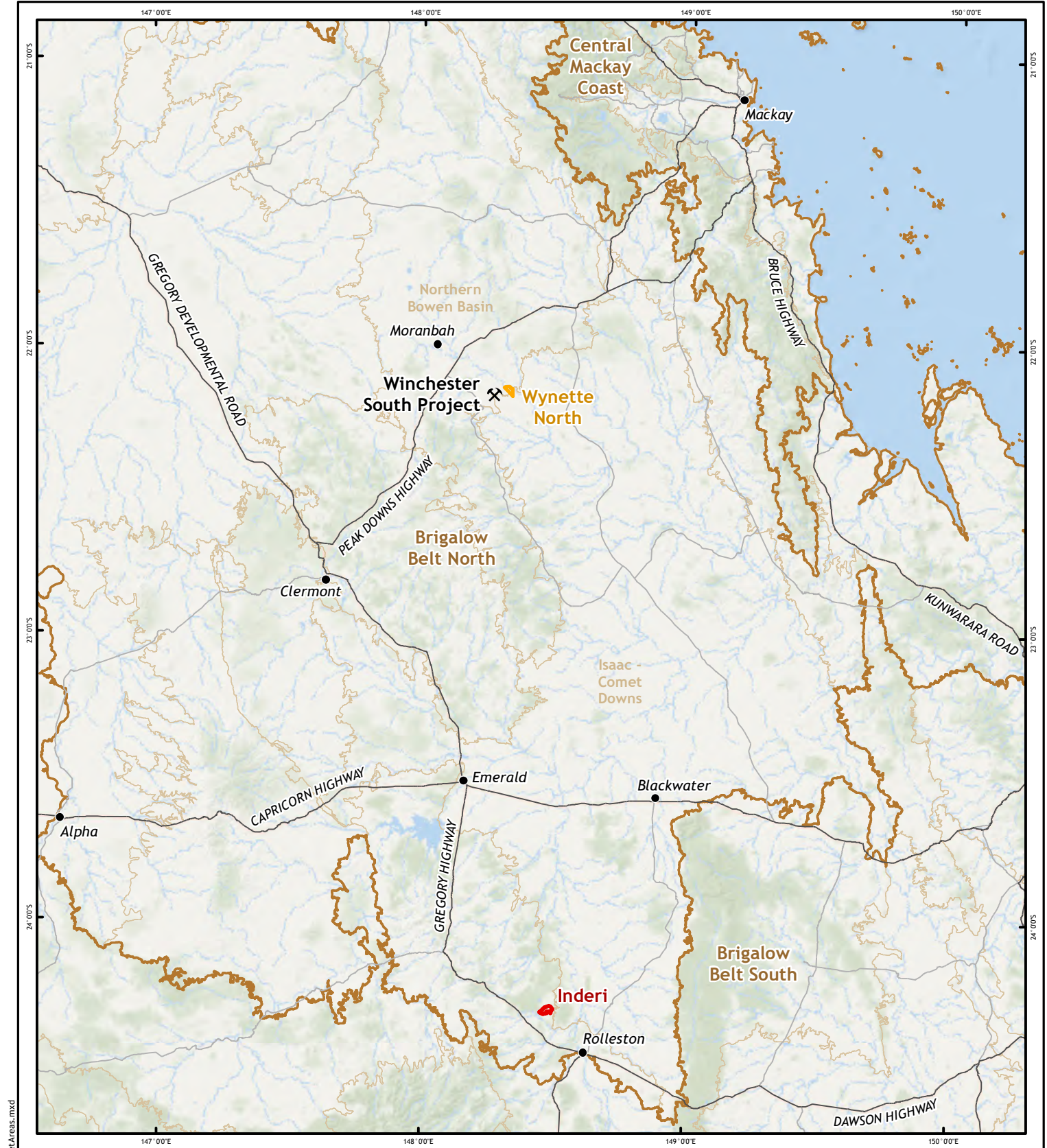


- connectivity.

The scope of the of the study involved:

- a desktop review of available vegetation mapping and environmental database records
- habitat assessments and targeted surveys for koala, greater glider, squatter pigeon (southern subspecies), ornamental snake and *Solanum adenophorum*
- ground-truthing the extent and condition of the mapped REs
- BioCondition surveys to supply input data for the Habitat Quality assessments in accordance with the Queensland Department of Environment and Science (DES) *Guide to determining terrestrial habitat quality* (2020d); and
- evaluation of the ecological features and processes that are essential to the maintenance and conservation of local ecosystem functioning (e.g. habitat connectivity, watercourses, threats).



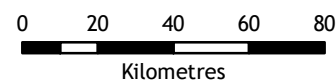


Legend

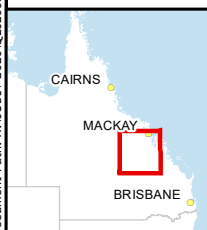
- Town
- ✕ Coal Resource Site
- Major Road
- Bioregion (IBRA v7)
- Biogeographic Subregions
- Inderi Study Area
- Wynette North Study Area



Scale 1:2,000,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Roads: © DNRME 2019
IBRA v7: © DNRME 2020
Coal Resource Site: © DNRME 2020

3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 1: REGIONAL LOCATION

WHITEHAVEN COAL

Map Number

1 of 1

Job Number

QEJ20054

Rev

3

2 Methods

The terrestrial ecological values of each study area were evaluated through a desktop assessment and a series of field assessments conducted in accordance with the recommended guidelines prescribed by the Queensland and/or Commonwealth governments. The following section details the methods employed to conduct both the desktop and the field assessments.

2.1 Desktop Assessment

The desktop assessment consolidated information from relevant databases, mapping, aerial imagery, and published literature to produce an initial characterisation of the ecological values of the Study Areas and the surrounding landscape. In part, this initial characterisation guides the assessment strategy employed in the field by highlighting information such as previously recorded target species, potential habitat features and mapped vegetation communities.

The desktop assessment collected information for each study area from the following sources:

- Commonwealth Department of Agriculture, Water and Environment (DAWE) Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) Database (DAWE, 2021a)
- Commonwealth DAWE Species Profile and Threats (SPRAT) Database (DAWE, 2021b)
- Queensland DES Matters of State Environmental Significance (MSES) Environmental Reports (DES, 2021a)
- DES Wildlife Online and WildNet databases for species listed under the *Nature Conservation Act 1992* (NC Act) (DES, 2021b)
- Queensland Department of Resources (DoR) Regulated Vegetation Management Map (including Essential habitat) (DoR, 2021)
- Atlas of Living Australia (ALA) (Atlas of Living Australia, 2020)
- GeoScience Australia 1:100,000 drainage network of Qld (Geoscience Australia, 2020)
- DNRME (now DoR) Detailed Surface Geology descriptions to confirm DES Land zone definitions (DNRME, 2021); and
- historical and latest available aerial photography (Qld Government Q-Imagery) (The State of Queensland, 2020).

Where required for desktop databases searches, a search radius of 20 km was applied from the approximate centre point of each study area. Approximate centre points were:

- Inderi Study Area (-24.3159; 148.4813); and
- Wynette North Study Area (-22.1621; 148.3202).



Preliminary vegetation mapping was also undertaken across each of the Study Areas through Aerial Photographic Interpretation (API). API allows for accurate vegetation community mapping at a property scale and allows for the accurate delineation of heterogeneous polygons mapped by DoR into homogenous polygons of REs. Based on the preliminary mapping, suitable representative survey sites were identified for each vegetation community to inform the field survey. This process also identified key areas to target during the field surveys in order to verify the correct RE classification as well as to undertake Habitat Quality Assessments. Consideration was also given to the likelihood of TEC presence.

2.2 Field Assessment

Field surveys were conducted to identify and characterise the presence, extent and condition of contemporary ecological values within each study area. While field surveys were undertaken to identify and map target MNES and MSES values (Section 1.2), additional environmental values were also recorded where practicable (i.e. opportunistically). The field survey methods employed adhere to the guidelines and methodologies prescribed or supported by the Queensland and Commonwealth governments.

2.2.1 Vegetation Communities

2.2.1.1 Regional Ecosystems

Ground-truthing and validating RE mapping, including selection of suitable survey sites within the study areas, was conducted in accordance with the Queensland Government's *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al., 2020). Using this methodology, quaternary vegetation surveys were carried out to classify REs occurring within each study area. Survey sites are depicted in Figure 3.

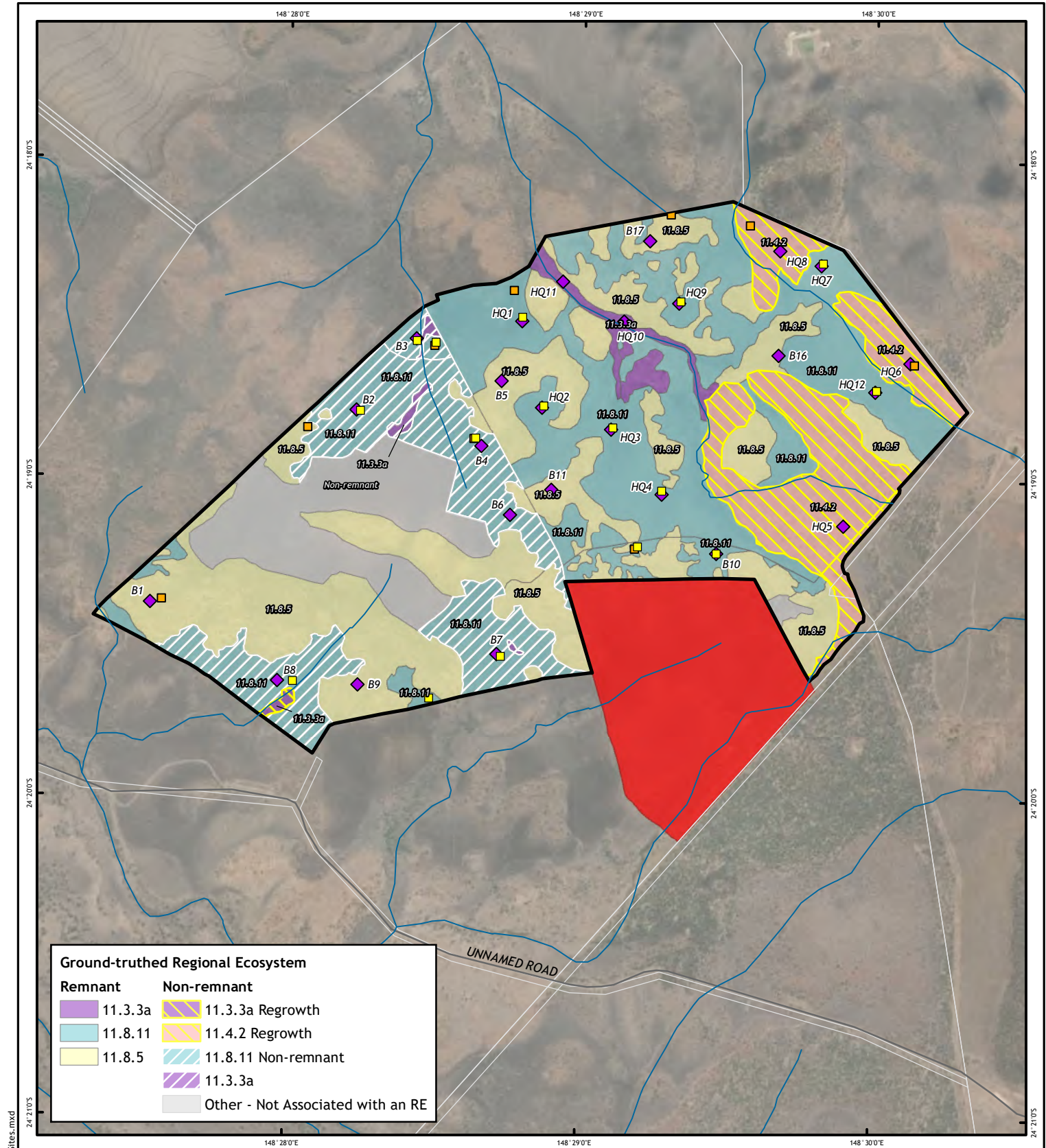
Ground-truthed vegetation was characterised as:

- Remnant vegetation - communities that conform with the definition under the *Vegetation Management Act 1999 (Qld)* (VM Act) and referenced by Neldner *et al.* (2020). Specifically, this comprises 'vegetation, part of which forms the predominant canopy of the vegetation:
 - covering more than 50% of the undisturbed predominant canopy
 - averaging more than 70% of the vegetation's undisturbed height; and
 - composed of species characteristic of the vegetation's undisturbed predominant canopy.
- Non-remnant vegetation - all vegetation that is not mapped as remnant vegetation. This includes regrowth and communities that have been historically cleared/disturbed or heavily modified (i.e. improved pastures, weed encroachment etc) that failed to meet the structural and/or floristic characteristics of remnant vegetation.

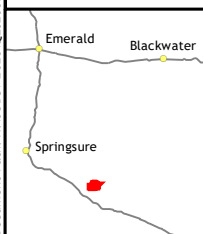
Information provided in the RE Technical Descriptions for the Brigalow Belt (DES, 2018) and structural formations of vegetation as defined by Specht (1970) served as a baseline for the undisturbed canopy, height and species with which to compare the field data and ascertain vegetation class.

Heterogeneous RE polygons mapped in each study area by DNRME (2020a) were ground-truthed and mapped as homogenous polygons.





Document Path: X:\JOBS\2020\QEJ20054\GIS\QEJ20054_BOR_2_Inderi_SurveySites.mxd



Notes:
Aerial Imagery: © ESRI 2020
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastre: © DNRME 2020
GTRE: © EZM 2020

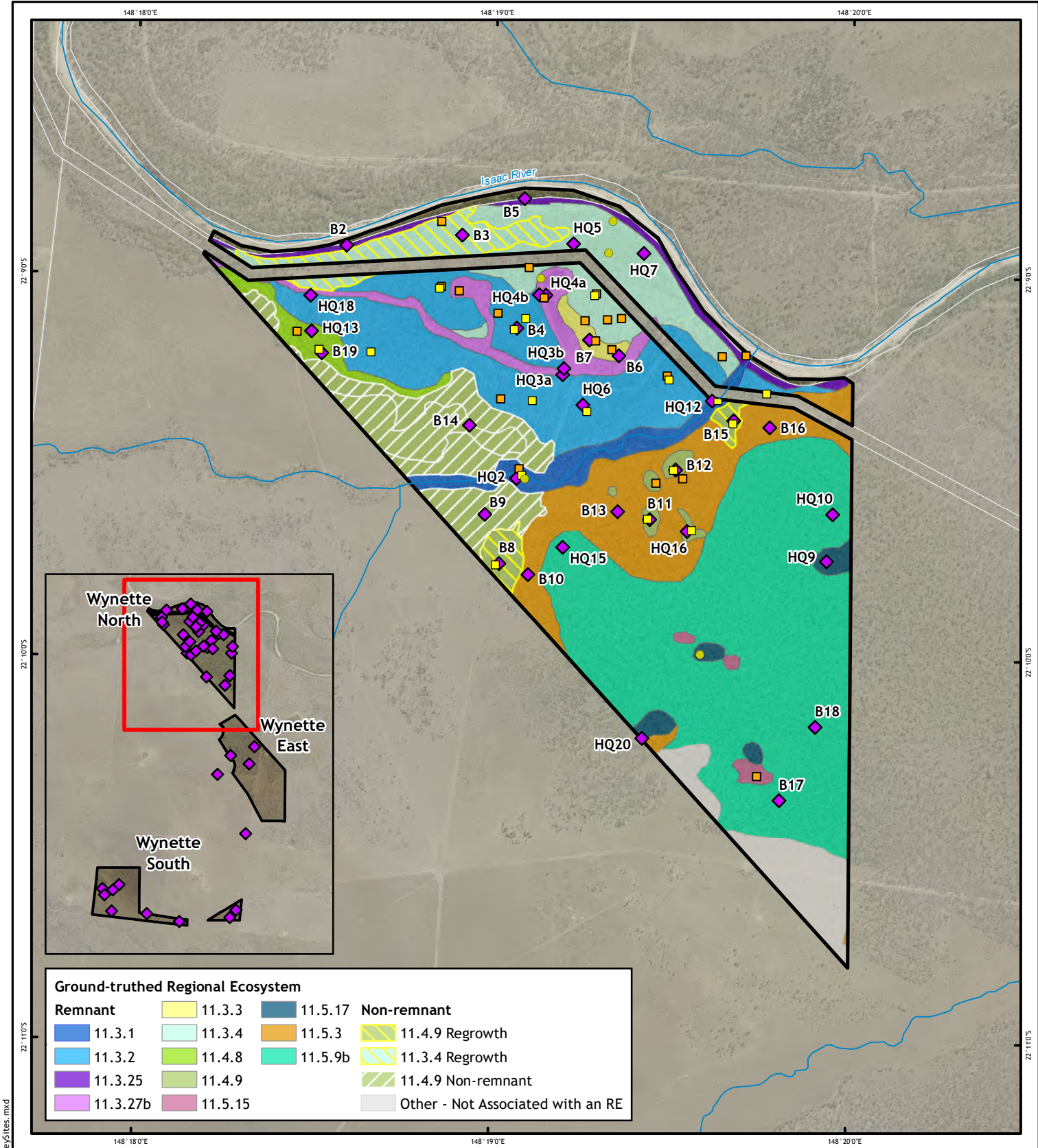
3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 2: SURVEY SITES WITHIN THE INDERI STUDY AREA

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3



Legend

- BioCondition Site
- TEC Assessment Site
- Quaternary Site
- Habitat Assessment Site
- Watercourse
- Cadastre
- Wynette North Study Area

Scale 1:25,000 (A4)

0 0.5 1 Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

Notes:

Aerial Imagery: © DNRME 2018, Whitehaven 2019
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastre: © DNRME 2019
GTRE: © E2M 2021

FIGURE 3: SURVEY SITES WITHIN THE WYNETTE NORTH STUDY AREA

Rev	Description	Drawn	Approved	Date
3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	13/09/2021

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

2.2.1.2 Threatened Ecological Communities

In conjunction with Quaternary vegetation assessments, TEC assessments were also undertaken during the field surveys within relevant vegetation communities to verify if key diagnostic characteristics and condition thresholds for EPBC Act-listed TECs were met. A detailed summary of associated diagnostic characteristics and condition thresholds for each TEC are outlined below. The specific condition criteria and characteristics used for the assessment of each TEC were based on the relevant ‘approved listing advice’ published for each TEC (identified by the Desktop Assessment [Section 2.1]).

2.2.1.2.1 Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC

To determine whether brigalow ecological communities meet the key diagnostic criteria for Brigalow TEC (Department of the Environment [DotE], 2013), each patch was assessed on whether they met the minimum thresholds pertaining to characteristics such as patch size and weed encroachment and to determine whether brigalow (*Acacia harpophylla*) was the dominant or co-dominant species within the tree layer. Using the recommendations of Butler (2007), remnant communities of poor condition were excluded from the Brigalow TEC if they included any of the following characteristics:

- brigalow patches that are smaller than 0.5 ha; and
- exotic perennial plants cover more than 50% of the patch, assessed in a minimum area of 0.5 ha (100 m by 50 m).

As described by the Queensland Herbarium (2019a), 16 REs are associated with the Brigalow TEC within the Brigalow Belt North bioregion. Where present, REs associated with Brigalow TEC within each study area were assessed against the key diagnostic criteria and condition thresholds outlined in the Approved Conservation Advice (DotE, 2013) to determine their status as the Brigalow TEC.

2.2.1.2.2 Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC

The Commonwealth Listing Advice for the Natural Grasslands TEC (Threatened Species Scientific Committee [TSSC], 2009) has characterized the community as containing:

- a usually sparse or absent tree canopy (less than 10% projective crown cover)
- a shrub layer of less than 50% projected crown cover; and
- the dominance of perennial native grasses and the presence of at least three the indicator native grass species outlined by the TSSC (2009).

Within the Brigalow Belt Bioregion of Queensland, the Queensland Herbarium (2019a) has defined the following REs as being associated with the Natural Grasslands TEC: 11.3.21, 11.4.4, 11.4.11, 11.8.11, 11.9.3, 11.9.12 and 11.11.17. Each grassland community was assessed for whether they belong to at least one of these REs and contains the relevant characteristics to determine whether the community meets the classification of the TEC (TSSC, 2009).

Relevant REs must be a patch that is of ‘good quality’ or ‘best quality’ to be classified as the Natural Grasslands TEC (TSSC, 2009). The thresholds for defining these conditions are outlined in Table 1.



Table 1. Condition Classes for the Natural Grasslands TEC

Criteria	Best quality	Good quality
Patch size	At least 1 ha; and	At least 5 ha; and
Grasses	At least 4 native perennial grass species from the list of perennial native grass indicator species; and	At least 3 native perennial grass species from the list of perennial native grass indicator species; and
Tussock cover	At least 200 native grass tussocks; and	At least 200 native grass tussocks; and
Woody shrub cover ¹	Total projected canopy cover of shrubs is less than 30%; and	Total projected canopy cover of shrubs is less than 50%; and
Introduced species	Perennial non-woody introduced species are less than 5% of the total projected perennial plant cover.	Perennial non-woody introduced species are less than 30% of the total projected perennial plant cover.

¹ The shrub layer is typically absent. However, where shrubs are present, they are defined as woody plants, more than 0.5 m tall that occupy the mid vegetation layer. The upper, or tree canopy layer, also is typically absent but may comprise scattered trees to less than 10% projective crown cover.

Sampling would be based upon a quadrat size of 0.1 ha (e.g. 50 m x 20 m) selected in an area with the most apparent native perennial grass species. Unless exceptional circumstances apply, to maximise the assessment of condition, sites must be assessed during a good season, two months after cessation of disturbance (fire/grazing/mowing/slashing) and within two months of effective rain.

2.2.1.2.3 Poplar Box Grassy Woodland on Alluvial Plains

Within the Brigalow Belt bioregion, the Poplar Box TEC is typically associated with the following REs: 11.3.2, RE 11.3.17, RE 11.4.7 and RE 11.4.12. Each vegetation community containing the relevant REs was assessed according to the conservation advice on Poplar Box TEC (Department of the Environment and Energy [DEE], 2019), which states that the community must have the following structure:

- a tree crown cover >10% at patch scale
- a tree canopy that shows the following characteristics:
 - canopy trees can reach a potential height of at least 10 m or more
 - a dominance of poplar box (*Eucalyptus populnea*) within the canopy layer
 - hybrids of poplar box with other *Eucalyptus spp.* must be counted as part of the poplar box component when assessing the previous criterion
 - a crown cover of shrubs to small trees (1 - 10 m height) less than 30%; and
- a ground cover dominated by perennial native grasses, other native herbs and sometimes chenopods.

Three Condition Classes (Class A, B and C) were also assessed for communities identified as the Poplar Box TEC consistent with the Poplar Box TEC conservation advice and are based on the (DEE, 2019):

- Class A (category A1) must contain at least the following:
 - A minimum patch size of ≥ 1 ha
 - The crown cover of canopy trees in the patch is $\geq 10\%$
 - $\geq 90\%$ of perennial vegetation cover in the ground layer is native; and
 - ≥ 30 native plant species per patch in the ground layer.



- Class A (category A2) must contain at least the following:
 - Minimum patch size of ≥ 5 ha
 - The crown cover of canopy trees in the patch is $\geq 10\%$
 - $\geq 70\%$ of perennial vegetation cover in the ground layer is native; and
 - ≥ 30 native plant spp. per patch in the ground layer.
- Class B must contain at least the following:
 - A minimum patch size of ≥ 5 ha
 - The crown cover of canopy trees in the patch is $\geq 10\%$
 - $\geq 50\%$ of perennial vegetation cover in ground layer is native, and either:
 - ≥ 20 perennial native plant species per patch in the ground layer
 - OR
 - ≥ 10 mature trees per ha with ≥ 30 cm dbh (and/or hollows).
- Class C must contain at least the following:
 - Minimum patch size of ≥ 5 ha
 - The crown cover of canopy trees in the patch is $\geq 10\%$
 - If $< 50\%$ of perennial vegetation cover in ground layer is native, then the patch must have:
 - ≥ 20 native plant spp. per patch in the ground layer
 - ≥ 10 mature trees per ha with ≥ 30 cm dbh (and/or hollows); and
 - smaller trees, saplings or seedlings suggestive of periodic recruitment.

A list of native plants associated with this TEC can be found in Appendix A of the Conservation Advice (including listing advice) for the Poplar Box TEC (DEE, 2019). Each vegetation community was assessed for whether they belong to at least one of these REs to determine whether the community meets the classification of the TEC (DEE, 2019).

2.2.1.2.4 Semi Evergreen Vine Thicket of the Brigalow Belt (North and South) and Nandewar Bioregions

The Semi Evergreen Vine Thicket of the Brigalow Belt (North and South) and Nandewar Bioregions TEC (SEVT TEC) comprises semi-evergreen vine thickets in eastern Queensland and northern New South Wales (TSSC, 2001). The TEC is characterised by a dry, subtropical vine scrub comprising woody species with microphylls (small single veined leaves) and the presence of bottle trees (*Brachychiton* spp.) as emergent species (TSSC, 2001). Ten Brigalow Belt REs are constituents of the SEVT TEC, including:

- RE 11.2.3 - Microphyll vine forest ("beach scrub") on sandy beach ridges
- RE 11.3.11 - Semi-evergreen vine thicket on alluvial plains
- RE 11.4.1 - Semi-evergreen vine thicket $\pm$ *Casuarina cristata* on Cainozoic clay plains
- RE 11.5.15 - Semi-evergreen vine thicket on Cainozoic sand plains/remnant surfaces
- RE 11.8.3 - Semi-evergreen vine thicket on Cainozoic igneous rocks
- RE 11.8.6 - *Macropteranthes leichhardtii* thicket on Cainozoic igneous rocks



- RE 11.8.13 - Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks
- RE 11.9.4 - Semi-evergreen vine thicket on Cainozoic fine-grained sedimentary rocks
- RE 11.9.8 - *Macropteranthes leichhardtii* thicket on Cainozoic fine-grained sedimentary rocks; and
- RE 11.11.18 - Semi-evergreen vine thicket on old sedimentary rocks with varying degrees of metamorphism and folding.

While there are no specific condition criteria for the SEVT TEC, the community is typically described as having an uneven canopy 4 to 9 m high with mixed evergreen, semi-evergreen and deciduous emergent tree species from 9 to 18 m high (DAWE, 2020b). Vines and twining or scrambling plants may also be prominent throughout (DAWE, 2020b).

SEVT was opportunistically observed during field surveys (i.e. it is not a target community [Section 1.2]).

2.2.2 Habitat Quality Assessments

Habitat quality is assessed using a combination of indicators that measure the overall viability of each study area and its capacity to support the relevant MNES/MSES. Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (herein referred to as the 'Habitat Quality Guide') which involved the collection and analysis of:

- landscape-scale attribute data
- site-based attribute data; and
- species habitat attribute data.

2.2.2.1 Landscape-scale Attributes

An assessment of landscape-scale attributes is required to determine if an offset is situated in a landscape that can achieve a conservation outcome (i.e. suitably connected and contains large tracts of vegetation). In accordance with the Habitat Quality Guide, each study area was assessed against the criteria summarised in Table 2. As each of the study areas are located within a fragmented landscape (30-95% non-remnant vegetation), ecological corridors were also assessed however, distance to permanent water was not assessed.

Table 2. Landscape-scale Attributes Assessment Criteria

Attribute	Description	Assessment extent	Maximum score
Size of patch	The size of the patch assessed and associated directly connecting remnant vegetation	NA	10
Connectedness	The proportion of the site's boundary that is connected to remnant vegetation	NA	5
Context	The percentage of remnant and regrowth vegetation within a 1 km buffer of the site	1 km buffer	5
Ecological Corridors	Proximity and location to DES mapped Statewide Biodiversity Corridors (fragmented landscapes only)	Corridor type (Bioregional, regional or subregional); and location (within, outside, shares boundary)	NA



2.2.2.2 Site-based Attributes

Site-based attribute data was collected within 100 m x 50 m areas (including various sub-plots) for each assessment unit (AU), weighted in accordance with the Habitat Quality Guide and compared to BioCondition benchmark values for the relevant RE benchmark (Queensland Herbarium, 2019b). A summary of the site-based attributes assessed (herein referred to as BioCondition sites), plot area and associated maximum score is summarised in Table 3.

A Trimble TDC600 Global Positioning System (GPS) device was used to record the location of mid-point (50 m mark) of each BioCondition site. The location of BioCondition sites recorded in each study area are depicted in Figures 2 and 3.

Table 3. Site-based Attributes Assessment Criteria

Attribute	Description	Assessment plot	Maximum score
Large trees	Number of large trees per hectare, as determined by existing BioCondition benchmarks for the associated RE	100 m x 50 m	15 [†]
Tree canopy height	Median canopy height in metres of the ecologically dominant layer	100 m x 50 m	5 [†]
Recruitment (%)	The proportion of overstorey species present at a site that are regenerating (<5 cm diameter at breast height [DBH])	100 m x 50 m	5 [†]
Tree canopy cover (%)	Vertical projection of the tree canopy crown cover along a transect	100 m transect	5 [†]
Shrub layer cover (%)	Vertical projection of the shrub layer cover of native shrubs	100 m transect	5 [†]
Coarse woody debris	The length of fallen woody logs and other coarse woody debris (>10 cm diameter and >0.5 m in length) per hectare	50 m x 20 m	5 [†]
Native plant species richness	Native plant species richness, comprising all life forms (i.e. trees, shrubs, grasses and forbs/other)	100 m x 50 m (trees) 50 m x 10 m (shrubs, grasses, forbs/other)	5 each (20 total)
Non-native plant cover (%)	Percentage cover of non-native/weed plant species	50 m x 10 m	10
Native perennial grass cover (%)	Average percentage cover of native perennial grass species	Five 1 m x 1 m	5
Organic litter cover	The average percentage cover of organic material such as fallen leaves, twigs, and branches <10 cm diameter	Five 1 m x 1 m	5

[†] Denotes site-based attributes which do not apply to grasslands REs.



2.2.2.3 Fauna Species-based Attributes

Habitat assessments were undertaken during field surveys to provide further information regarding habitat suitability for targeted threatened fauna species (Section 1.2). Habitat assessments included evaluation of key indicators specific to each target threatened fauna species. Habitat assessments, for the most part, were undertaken in conjunction with BioCondition Sites (Figures 2 and 3). Key habitat indicators include, but were not limited to:

- abundance of prey species (e.g. frogs)
- proximity to water and availability (permanent/ephemeral)
- gilgai depth, soil crack depth and abundance, presence of amphibians
- habitat patch size and vegetation type (remnant, regrowth, etc.)
- foraging opportunities
- tree and log hollow abundance and size (per ha)
- percent (%) composition and cover (%) of koala food tree species
- habitat connectivity
- presence and abundance of potential threats (i.e. cattle grazing, invasive species, habitat degradation)
- abundance of woody debris
- rocky outcrop presence/abundance
- leaf litter abundance; and
- type / level of disturbance.

Each key habitat indicator was scored on a scale from 0 (absent/low) to 25 (very high) for each AU and used to calculate a weighted score. A total species habitat score (out of 10) was then calculated for each target threatened fauna species (Section 4.4.3).

2.2.3 Threatened Species Surveys

Target flora and fauna species were surveyed in accordance with the methods described within the relevant prescribed survey guidelines including:

- *EPBC Act Referral Guidelines for the Vulnerable Koala* (DotE, 2014)
- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al., 2018)
- *EPBC Act Draft Referral Guidelines for the Nationally-listed Brigalow Belt Reptiles* (Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC], 2011a)
- *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPaC, 2011b)
- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts [DEWHA], 2010)
- *Survey Guidelines for Australia's Threatened Mammals* (DSEWPaC, 2011c); and
- the random meander technique as described by Cropper (1993).



2.2.3.1 Targeted Threatened Fauna and Flora Surveys

Targeted fauna and flora surveys were undertaken in areas within each study area likely to support suitable habitat for target MNES and MSES fauna species (Sections 1.2). Based on the outcomes of the desktop assessment, target threatened flora and fauna determined to potentially occur within the study areas were:

- *Solanum adenophorum*
- koala (*Phascolarctos cinereus*)
- greater glider (southern and central) (*Petauroides volans*)
- squatter pigeon (southern subspecies) (*Geophaps scripta scripta*); and
- ornamental snake (*Denisonia maculata*).

The targeted survey methods relevant to these species were employed during field surveys including:

- active, diurnal searches for *Solanum adenophorum* and koala presence (i.e. scratches and scat)
- waterbody watches (e.g. dams, troughs etc) targeting squatter pigeon
- nocturnal, spotlighting transects targeting ornamental snake, greater glider, and koala - these surveys were conducted on foot using a hand-held and/or head torch to detect eye shine and investigate microhabitats (e.g. decorticating bark or coarse woody debris) within each habitat type
- slow vehicle drive spotlighting was also undertaken to target targeting all fauna species; and
- opportunistic observations.

Targeted fauna surveys conducted within each of the study areas aimed to meet the prescribed survey effort guidelines for the targeted threatened fauna species; however, in some cases, achieving the recommended survey effort in the guidelines was not necessary or practical, particularly where effort was measured by survey hours per potential habitat area, or where the target species had already been verified. While the recommended survey effort in the guidelines was not always achieved, the survey effort undertaken is considered to be sufficient for the purposes of a baseline assessment to inform possible environmental offset options. Where possible, targeted survey effort for a particular species was supplemented by habitat assessments.

No fauna habitat assessments were conducted within the Inderi Study Area as it was not identified to contain habitat for targeted threatened fauna species during the desktop assessment (Section 2.1).



3 Inderi Study Area

The Inderi property (Lot 55 on Plan DSN318) currently supports cattle grazing and is situated approximately 20 km north-west of the township of Rolleston in central Queensland. This study focussed on an 877 ha area largely characterised by improved pasture with pockets of remnant and regrowth vegetation. The DoR have mapped remnant 'Of Concern' native grassland (RE 11.8.11) with potential to qualify as a Natural Grassland TEC within the Inderi Study Area.

An existing offset area secured by BHP Mitsubishi Alliance (BMA), is also located within the Inderi property, situated immediately south of the area designated as the Inderi Study Area (Figure 2) (the BMA Offset Area).

3.1 Desktop Assessment Results

The desktop assessment identified the following environmental matters as 'potentially occurring' in a search area which covered the Inderi Study Area:

- MNES identified under the EPBC Act (DAWE, 2020a), including:
 - Natural Grassland TEC
 - king bluegrass (*Dichanthium queenslandicum*)
 - bluegrass (*Dichanthium setosum*); and
 - ornamental snake (*Denisonia maculata*).
- MSES including (DES, 2020a):
 - Regulated Vegetation, comprising:
 - 'Of Concern' prescribed REs (REs 11.3.3a and 11.4.2)
 - watercourse REs; and
 - essential habitat for ornamental snake (*Denisonia maculata*).

Results from the desktop assessment are provided in Appendix A.1.

3.2 Field Survey Results

3.2.1 Survey Conditions

Two field assessments were conducted between 6 - 7 May and 3 - 4 June 2020 each by two E2M ecologists (Section 2.2). Survey conditions during the first field assessment were dry and moderately cool with daily temperatures ranging between 10°C and 27°C⁴ (Bureau of Meteorology (BoM), 2020). The broader area had received below average rainfall during the three months preceding the survey.

Weather conditions during the second field survey were also dry and cool with daily temperatures ranging from 3°C to 21°C². The area had received nominal rainfall since the first field survey.

⁴ Weather data recorded at Rolleston Airport (weather station number 35129), 22 km south east of Inderi study area (BoM, 2020).



3.2.2 Vegetation Communities

3.2.2.1 Regional Ecosystems

The ground-truthed vegetation communities (GTREs) within the Inderi Study Area are listed in Table 4 and shown on Figure 4. The extent of GTREs within the Inderi Study Area were generally consistent with those mapped by DoR. Some areas of DoR-mapped non-remnant vegetation within the western extent of the Inderi Study Area were found to contain remnant vegetation (RE 11.8.11).

Two REs listed as ‘Of Concern’ under the VM Act were ground-truthed within the Inderi Study Area, namely, RE 11.3.3a and RE 11.8.11 (Table 4; Figure 4). One regional ecosystem (11.8.5) listed as ‘Least Concern’ under the VM Act was ground-truthed within the Inderi Study Area. Regrowth vegetation that was analogous with RE 11.4.2 and RE 11.3.3a (both of which are listed as ‘Of Concern’ REs under the VM Act) are also present (Table 4; Figure 4).

3.2.2.2 Threatened Ecological Communities

3.2.2.2.1 Natural Grasslands TEC

Natural Grasslands TEC is comprised of native perennial grass species located on undulating plains and with minimal cover of woody vegetation. Due to their vulnerability to disturbance and degradation associated with agricultural land uses, two condition classes, ‘best quality’ and ‘good quality’, are described for the TEC. Determination of the associated condition class is dependent on a variety of criteria including patch size, richness of specific native grass indicator species, tussock density, woody cover and cover of exotic species.

Field surveys identified approximately 232.21 ha of ‘good quality’ Natural Grasslands TEC characterised by remnant RE 11.8.11 within the Inderi Study Area (Table 4; Figure 5). Natural Grasslands TEC indicator species present include: white spear-grass (*Aristida leptopoda*), satin-top grass (*Bothriochloa erianthoides*), Queensland bluegrass (*Dichanthium sericeum*), native millet (*Panicum decompositum*), yabila grass (*P. queenslandicum*), *Paspalidium globoideum* and cup grass (*Eriochloa crebra*).

Several exotic species were recorded throughout the Natural Grassland TEC including parthenium (*Parthenium hysterophorus**), buffel grass (*Cenchrus ciliaris**), red Natal grass (*Melinis repens**) and *Physalis lanceifolia**. While the extent of weeds could not definitively be assessed during the survey period (dry season), the condition of the vegetation at the time of the survey was adequate to qualify RE 11.8.11 as the ‘good quality’ Natural Grasslands TEC. Due to the percentage foliage cover of non-native grasses (>5%), no ‘best quality’ Natural Grasslands TEC was observed within the Inderi Study Area.

The field surveys also identified approximately 132.57 ha (Table 4) of poor condition natural grasslands (recognised as non-remnant vegetation) which do not currently qualify as the Natural Grasslands TEC (Table 4; Figure 5). Poor condition natural grasslands, while dominated or co-dominated by native grasses, did not meet condition criteria identified within the Listing Advice (TSSC, 2009). Specifically, these communities were found to contain greater than 30% cover of non-native species, parthenium (*Parthenium hysterophorus**), buffel grass (*Cenchrus ciliaris**), red Natal grass (*Melinis repens**) and *Physalis lanceifolia**.

* Exotic weed species.



Table 4. Ground-truthed Vegetation Communities within the Inderi Study Area

RE	BVG	Status		Vegetation Description	Remnant (ha)	Non-remnant (ha)	Total (ha)
		VM Act ¹	Biodiversity Status ²				
11.3.3a	21b	OC	OC	Regrowth <i>Melaleuca bracteata</i> woodlands (8 m) on alluvial flats with <i>Acacia salicina</i> and <i>Eremophila mitchellii</i> . A sparse shrub layer comprised <i>Geijera parviflora</i> , <i>Carissa ovata</i> and juvenile canopy species. The ground layer was dominated by native grasses including <i>Aristida latifolia</i> , <i>Aristida leptopoda</i> , <i>Bothriochloa ewartiana</i> and <i>Dichanthium sericeum</i> . Infestations of <i>Parthenium hysterophorus</i> *, <i>Cenchrus ciliaris</i> * and <i>Bothriochloa pertusa</i> * were present throughout these areas (Photo 1).	15.66	1.44 (regrowth) 3.43 (non-remnant)	20.53
11.4.2	17a	OC	OC	<i>Eucalyptus melanophloia</i> degraded/regrowth woodlands (12m) on cracking, clay plains with <i>Corymbia erythrophloia</i> , <i>Bursaria incana</i> and <i>Brachychiton populneus</i> . <i>Geijera parviflora</i> , <i>Carissa ovata</i> and <i>Capparis lasiantha</i> were common shrub species. The ground layer was dominated by native and exotic grasses including <i>C. ciliaris</i> *, <i>Eragrostis sororia</i> , <i>Themeda triandra</i> and <i>Bothriochloa pertusa</i> *. Infestations of <i>Parthenium hysterophorus</i> * were also present (Photo 2).	-	112.59 (regrowth)	112.59
11.8.5	11a	LC	NC	<i>Eucalyptus orgadophila</i> and <i>C. erythrophloia</i> woodland (14m) on basalt derived plains. <i>Grewia latifolia</i> , <i>Bursaria incana</i> and juvenile canopy species dominated the shrub layer. The ground layer comprised a combination of native and exotic grass species including <i>Heteropogon contortus</i> , <i>Cenchrus ciliaris</i> *, <i>Aristida leptopoda</i> , <i>Eriochloa crebra</i> and <i>Melinis repens</i> *. Associated forbs included <i>Phyllanthus virgatus</i> , <i>Rhynchosia minima</i> and <i>Corchorus trilocularis</i> . Most areas contained infestations of <i>Parthenium hysterophorus</i> * (Photo 3).	287.18	-	287.18

RE	BVG	Status		Vegetation Description	Remnant (ha)	Non-remnant (ha)	Total (ha)
		VM Act ¹	Biodiversity Status ²				
11.8.11	30b	OC	OC	Native tussock grasslands on basalt plains comprising by <i>Dichanthium sericeum</i> , <i>Iseilema vaginiflorum</i> , <i>Eriochloa crebra</i> , <i>Panicum decompositum</i> and <i>Aristida leptopoda</i> . Occurrences of exotic grasses including <i>Cenchrus ciliaris</i> *, <i>Melinis repens</i> * and <i>Bothriochloa pertusa</i> * were also present. Infestations of <i>Parthenium hysterophorus</i> * were present throughout this community (Photo 4).	232.21	132.57	364.77
Non-remnant other				Vegetation not consistent with a particular RE.	-	92.25	92.25
Total					535.05	342.28	877.32

¹ VM Act class: E - endangered, OC - of concern, LC - least concern

² Biodiversity Status: E - endangered, OC - of concern, NC - no concern at present

* Exotic weed species.



Photo 1. RE 11.3.3a



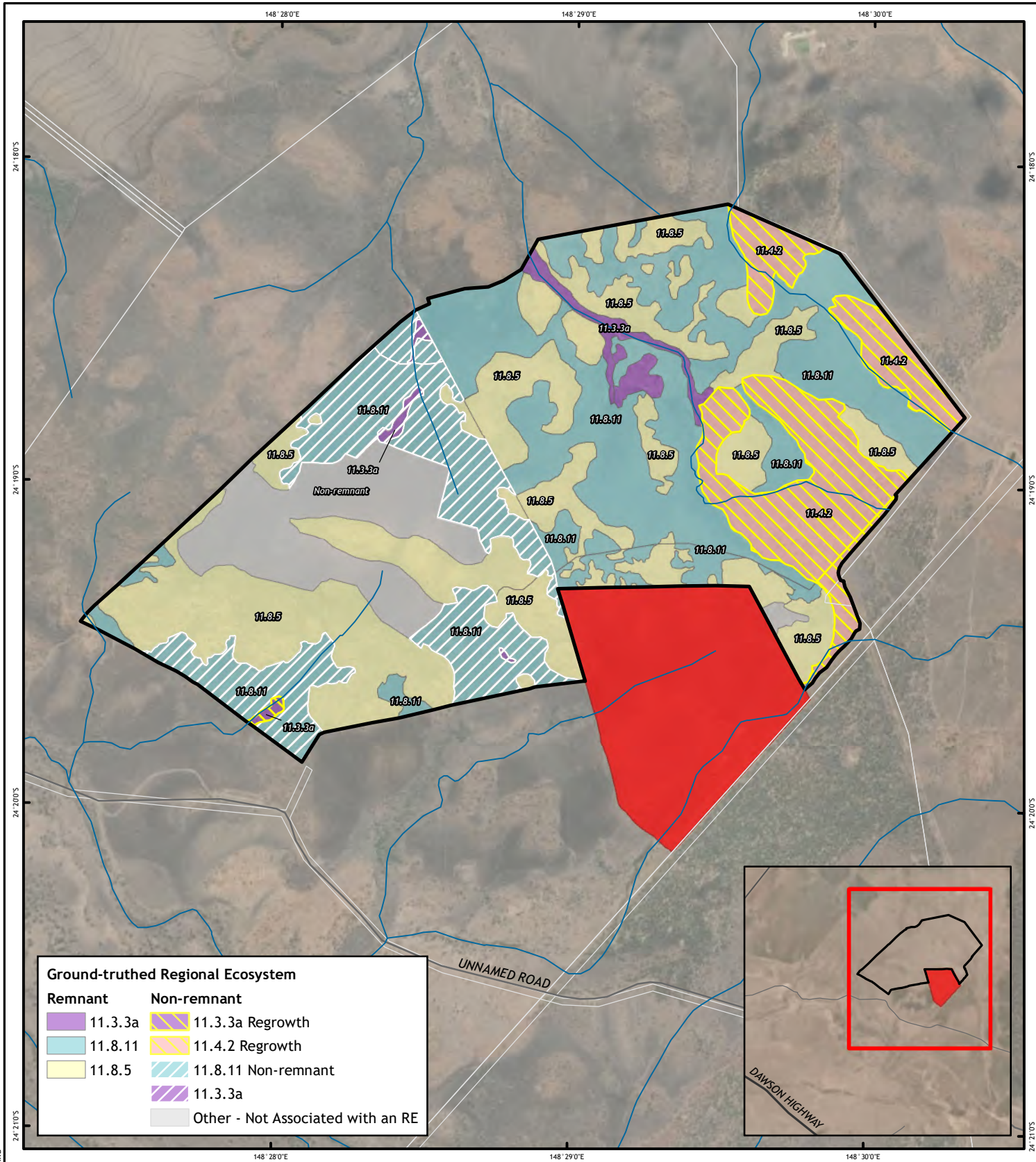
Photo 2. RE 11.4.2



Photo 3. RE 11.8.5



Photo 4. RE 11.8.11



Legend

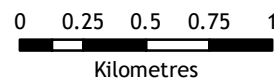
- Watercourse
- Road
- Cadastre
- Inderi Study Area

Regulated Vegetation Management Map

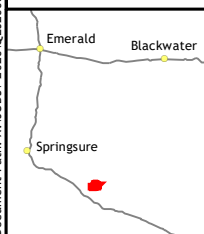
- Category A area



Scale 1:30,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © ESRI 2020
Watercourse: © Geoscience Australia 2018
Road: © PSMA 2014
Cadastre: © DNRME 2020
GTRE: © EZM 2020

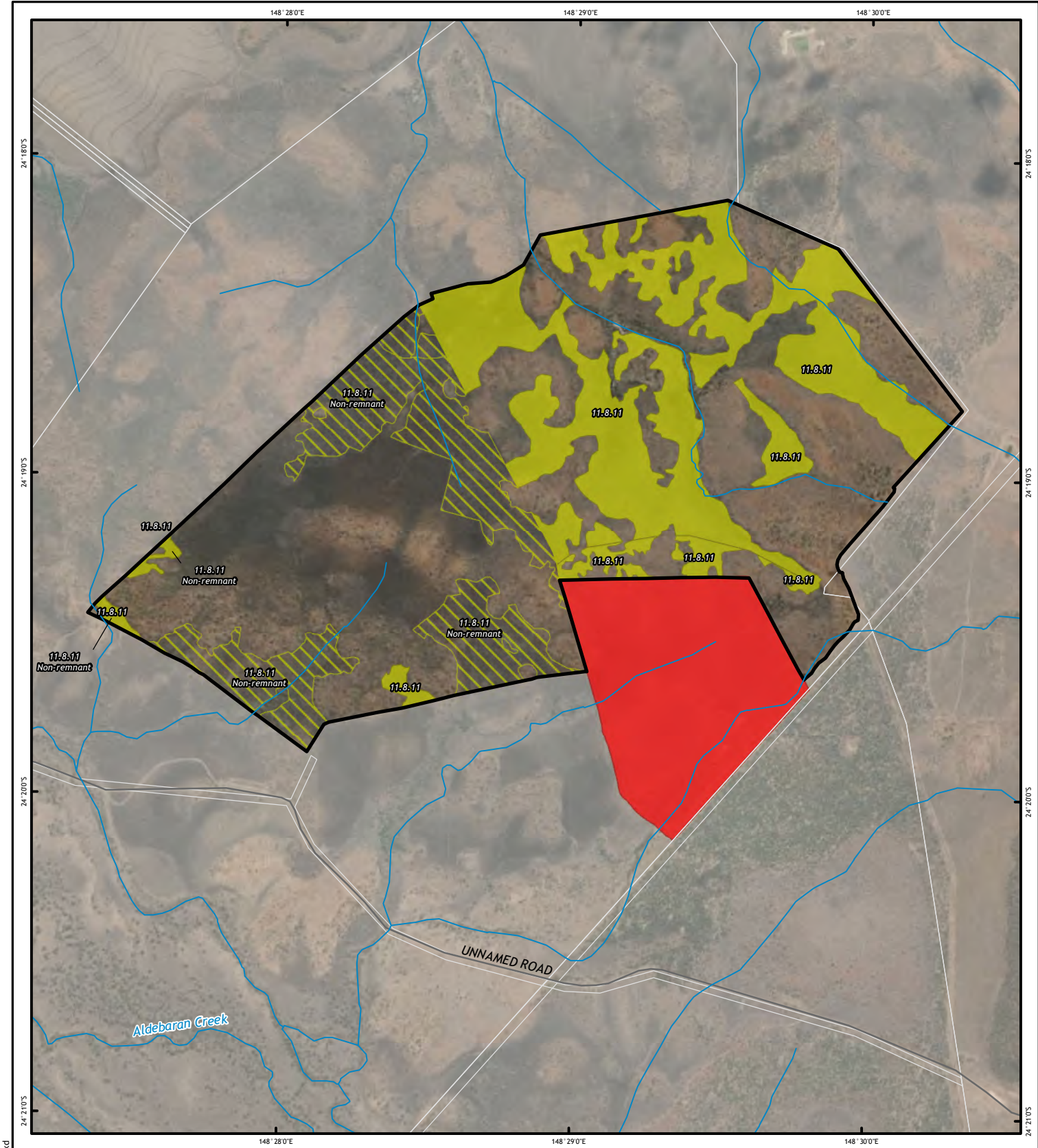
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1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 4: INDERI STUDY AREA GROUND-TRUTHED REGIONAL ECOSYSTEMS

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3



- Legend**
- Road
 - Watercourse
 - Cadastre
 - Inderi Study Area
 - Natural Grassland Threatened Ecological Community
 - Poor quality grasslands that do not meet the Natural Grasslands TEC criteria
 - Regulated Vegetation Management Map**
 - Category A area

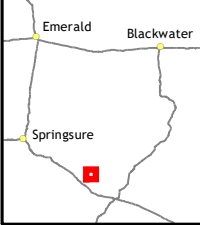
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Scale 1:30,000 (A4)

0 0.25 0.5 0.75 1

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
 Aerial Imagery: © ESRI 2020
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 GTRE: © E2M 2020

3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 5: INDERI STUDY AREA THREATENED ECOLOGICAL COMMUNITIES

WHITEHAVEN COAL		Rev
Map Number	Job Number	
1 of 1	QEJ20054	3

Document Path: X:\JOBS\2020\QEJ20054\GIS\QEJ20054_BOR_5_Inderi_TEC.mxd

3.2.3 Threatened Flora Species

No threatened flora species were recorded during the field surveys; however, the Inderi Study Area contains potential habitat (RE 11.8.11 and RE 11.8.5) for two threatened flora species, namely *Dichanthium queenslandicum* and *Dichanthium setosum*.

3.2.3.1 *Dichanthium queenslandicum*

Dichanthium queenslandicum ('Endangered' under the EPBC Act; 'Vulnerable' under the NC Act) typically occurs within native grasslands and grassy, open eucalypt woodlands on heavy black soils. One record of *Dichanthium queenslandicum* is located <1 km south of the Inderi Study Area, within the BMA Offset Area. The species was recorded as the dominant species in the ground layer within the ecotone between RE 11.8.5 and RE 11.8.11 (Collection ID BRI AQ0852497). Several additional records for *Dichanthium queenslandicum* are located in proximity to the Rolleston Mine and the Dawson Highway (15 km southwest and 14 km west of the Inderi Study Area, respectively). Approximately 520 ha of potential habitat for *Dichanthium queenslandicum* was observed within the Inderi Study Area in association with remnant REs 11.8.11 and 11.8.5.

3.2.3.2 *Dichanthium setosum*

Dichanthium setosum ('Vulnerable' under the EPBC Act) also occurs in natural grasslands and eucalypt woodlands on heavy, basalt-derived, black soils and red-brown, hard-setting, loam with clay subsoils. The species is relatively tolerant to disturbance and has been recorded within disturbed areas such as cleared woodlands, grassy roadside remnants, grazed land and pastures. The species has been recorded on the Meteor Downs Station, located 10 km west of the Inderi Study Area within *E. orgadophila*, *E. melanophloia* and *C. erythrophloia* open woodlands (RE 11.8.5) (BRI AQ0971077; BRI AQ0971078; BRI AQ0732237). Approximately 520 ha of potential habitat for *Dichanthium setosum* was observed within the Inderi Study Area in association with remnant REs 11.8.11 and 11.8.5.

3.2.4 Threatened Fauna Species

No threatened fauna species were recorded during the field surveys within the Inderi Study Area. Suitable habitat for target threatened fauna species was limited within the Inderi Study Area. The DoR-mapped essential habitat for the ornamental snake was inspected during the field surveys and found to lack the attributes required to support the species.

3.2.5 Ecological Function

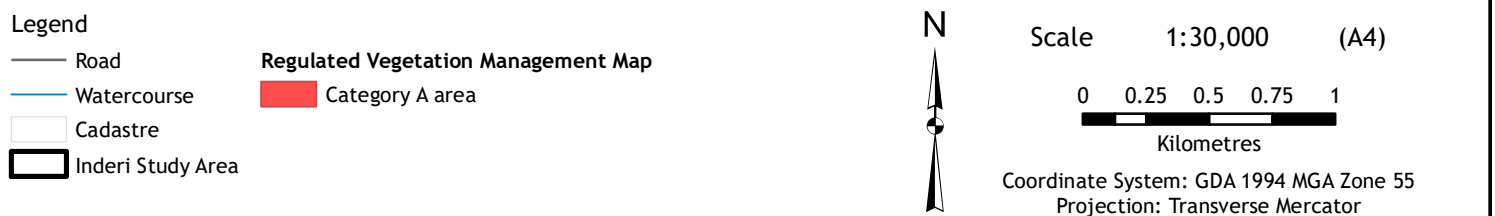
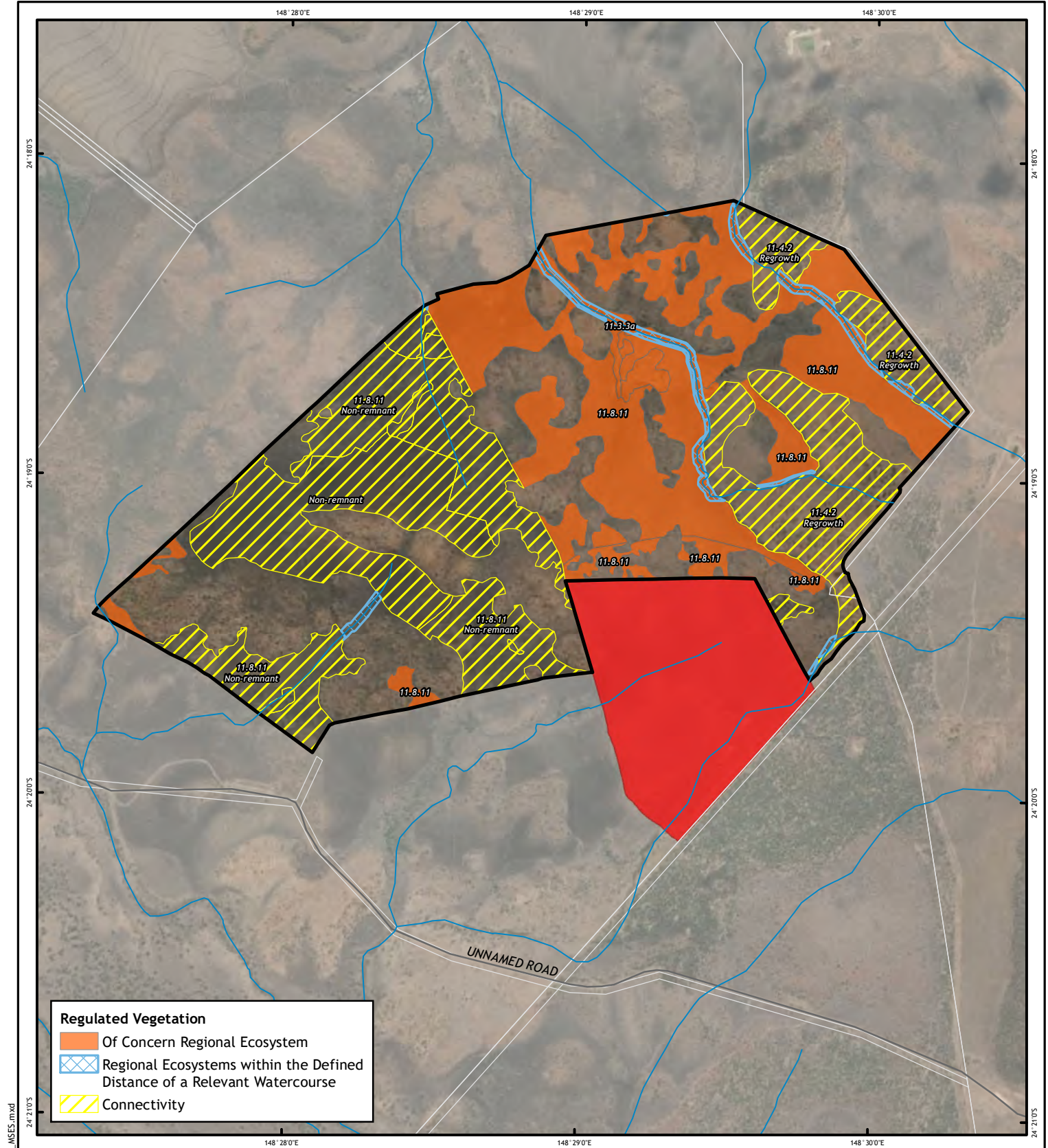
3.2.5.1 Waterway and Wetland Features

The Inderi Study Area contains DoR-mapped stream order (SO) 1 and 2 watercourses. All watercourses and drainage lines within the Inderi Study Area are ephemeral and were dry at the time of the field surveys. Riparian corridors varied in composition and structure with some areas fringed by regrowth/degraded black tea tree (*Melaleuca bracteata*) and native grasslands. The watercourses at the time of field surveys were narrow, meandering channels with black, loam beds.

Four SO 1 watercourses and one SO 2 watercourse intersect with remnant REs 11.3.3a, 11.8.11 and 11.8.5 within the Inderi Study Area (Figure 6). Approximately 18 ha of remnant vegetation is located within the defined distance (i.e. 25 m for SO 1 or 2) from the defining banks and qualifies as a MSES (i.e. watercourse REs).

Similarly, no MSES high ecological significant (HES) wetlands or wetland protection areas are mapped within the Inderi Study Area (Figure 6).





Notes:
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Road: © PSMA 2014
Cadastre: © DNRME 2020
GTRE: © EZM 2020

3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 6: INDERI STUDY AREA MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

3.2.5.2 Connectivity

Non-remnant ecosystems are able to be used to offset impacts when located in Connectivity Areas within the same subregion in accordance with the Queensland *Environmental Offsets Policy*. As the Inderi Property (which includes the Inderi Study Area) is located in the Basalt Downs subregion of the Brigalow Belt Bioregion, non-remnant communities within this Subregion may not be suitable to offset impacts to connectivity.

A total of 254.37 ha of non-remnant ecosystems (comprising regrowth communities associated with an RE) were ground-truthed within the Inderi Study Area (Figure 6 and listed in Table 5).

3.3 MNES and MSES Summary

The Inderi Study Area supports a number of MNES values identified under the EPBC Act, including:

- 227.74 ha of Natural Grassland TEC
- Suitable habitat for:
 - *Dichanthium queenslandicum*; and
 - *Dichanthium setosum*

A number of ground-truthed ecological values classified as MSES (Figure 3), under the Queensland *Environmental Offset Act 2014* (EO Act) were identified within the Inderi Study Area, including:

- Regulated Vegetation, comprising:
 - ‘Of Concern’ REs
 - prescribed REs located within a defined distance from the defining banks of a mapped watercourse; and
 - connectivity areas.

A summary of the relevant MNES and MSES values within the Inderi Study Area is provided in Table 5.

Table 5. MNES and MSES Recorded within the Inderi Study Area

Environmental matter	Relevant RE(s)	Broad condition class	Area available within the Inderi Study Area (ha)
MNES known to occur			
Natural Grassland TEC	11.8.11	remnant	232.21
MNES likely to occur			
King bluegrass (<i>Dichanthium queenslandicum</i>)	11.8.11 and 11.8.5	remnant	519.38



Environmental matter	Relevant RE(s)	Broad condition class	Area available within the Inderi Study Area (ha)
<i>Dichanthium setosum</i>	11.8.11 and 11.8.5	remnant	519.38
MSES known to occur			
Of Concern RE	11.3.3a (BVG 21b)	remnant	15.66
Of Concern RE	11.8.11 (BVG 30b)	remnant	232.21
Watercourse RE	11.3.3a (BVG 21b)	remnant	10.91
	11.8.5 (BVG 11a)	remnant	2.66
	11.8.11 (BVG 30b)	remnant	9.55
Connectivity (Basalt Downs subregion)	Non-remnant RE vegetation	non-remnant (regrowth) REs	254.37
MSES likely to occur			
King bluegrass (<i>Dichanthium queenslandicum</i>)	Refer to MNES likely to occur		

3.4 Habitat Quality Assessment Results

3.4.1 Landscape-scale Attribute Score

A summary of landscape-scale attribute scores for the Inderi Study Area are summarised in Table 6. The Inderi Study Area has a total landscape-scale attribute score of 19 out of 20.

Table 6. Inderi Study Area Landscape-scale Attribute Scores

Landscape attribute	Comment	Score
Patch size	>500 ha of remnant	10
Connectivity	72% remnant adjacent and >500 ha remnant	5
Context	69% remnant	4
Total		19

3.4.2 Site-based Attribute Scores

A total of 25 BioCondition surveys were undertaken across the five AU (categorised by RE and vegetation class) identified within the Inderi Study Area (Figure 2). Site-based Habitat Quality calculations and BioCondition data for the Inderi Study Area are provided in Appendix B.1.



AU scores were generally of moderate condition ranging from 3.38 to 7.08 (maximum score of 10) when compared to the benchmark. Site condition attributes contributing to a decrease in Habitat Quality scores included:

- lower native grass and forb cover and species richness, particularly within natural grasslands (AU 1a and 1b), likely attributed to the survey timing
- high non-native plant cover, particularly from non-native grasses and forbs, including *Cenchrus ciliaris** (buffel grass), *Bothriochloa pertusa** (Indian bluegrass), *Physalis* sp.*, *Megathyrsus maximus** (Guinea grass) and *Parthenium hysterophorus** (parthenium)
- dieback of large trees which resulted in low large tree numbers within some sites, particularly regrowth RE 11.3.3a (AU 4) and 11.4.2 (AU 3); and
- low values for coarse woody debris cover, potentially due to grazing management and historical clearing (selective) and thinning of large trees.

Field surveys identified a number of MNES and MSES values within the Inderi Study Area. Approximately 227.74 ha of Natural Grassland TEC was identified in association with remnant RE 11.8.11. A further 246.06 ha of MSES Regulated vegetation, comprising remnant of concern RE and regulated vegetation intersecting a watercourse was also ground-truthed within the Inderi Study Area (Table 7).

Table 7. Inderi Study Area Summary of Site-based Attribute Scores

Environmental matter	Assessment Unit	RE	Area (ha)	Average Site Based Attribute Score (/10)
MNES known to occur				
Natural Grassland TEC	1a	11.8.11	232.21	4.44
MSES known to occur*				
Of Concern RE (BVG 21b)	4	11.3.3a	15.66	3.38
Of Concern RE (BVG 30b/21b)	1a	11.8.11	232.21	4.44
	1	11.8.11 (BVG 30b)	9.55	4.44
Watercourse RE	2	11.8.5 (BVG 11a)	2.66	7.08
	4	11.3.3a (BVG 21b)	5.82	3.38

* Non-remnant vegetation that can be used to offset connectivity areas is also presented in Table 5 and Figure 6.



4 Wynette North Study Area

The Wynette North Study Area currently supports cattle grazing on improved pastures surrounded by patches of eucalypt woodland and brigalow vegetation. The Wynette North Study Area focuses on a 535 ha area situated between the northern extent of the Project disturbance footprint and the bank of the Isaac River (Figure 3). The Wynette North Study Area excludes a road reserve that comprises approximately 21 ha (Figure 3).

4.1 Desktop Assessment Results

The desktop assessment identified the following environmental matters potentially occurring in a search area covering the Wynette North Study Area:

- MNES identified under the EPBC Act, including:
 - TECs (DAWE, 2021a)
 - Natural Grassland TEC
 - Brigalow TEC
 - Poplar Box TEC; and
 - Previous records (DES, 2021b; E2M, 2020) and known/potentially suitable habitat (DAWE, 2020a) for a number of threatened species including:
 - koala (*Phascolarctos cinereus*)
 - greater glider (southern and central) (*Petauroides volans*)
 - squatter pigeon (southern subspecies) (southern) (*Geophaps scripta scripta*)
 - *Solanum adenophorum*; and
 - ornamental snake (*Denisonia maculata*)
- MSES including (DES, 2020a):
 - Regulated Vegetation, comprising
 - ‘Of Concern’ remnant vegetation (comprising RE 11.3.2)
 - remnant vegetation intersecting a watercourse
 - essential habitat for ornamental snake (*Denisonia maculata*); and
 - historical records (DES, 2020b) within 20 km of the Wynette property for *Solanum adenophorum*, including those within the Winchester South Project Area (E2M, 2021).

Results from the desktop assessment are provided in Appendix A.2.



4.2 Field Survey Results

4.2.1 Survey Conditions

The Wynette North Study Area was surveyed between 6 - 12 May 2020 (dry season) and 19 to 23 January 2021 (wet season) each by two E2M ecologists. Wet and dry season surveys comprised RE verification, targeted threatened species searches (for koala, greater glider and squatter pigeon) and Habitat Quality assessments. Noting that during the dry season conditions were not suitable for the detection of the ornamental snake, field surveys undertaken during the wet season targeted the species within suitable habitat areas.

Weather conditions during the dry season survey were dry and moderately cool with daily temperatures ranging between 13°C and 29°C⁵. The broader area had received limited rainfall (approximately 5 mm) in the month preceding the survey and below average rainfall during the three months preceding the survey.

The wet season survey conditions were hot and dry with daily temperatures ranging from 19°C to 35°C³. The broader area had received approximately 239 mm of rain in the two months preceding the survey resulting in the emergence of reproductive material as well as annual forbs and grasses in the understorey³.

4.2.2 Vegetation Communities

4.2.2.1 Regional Ecosystems

The GTREs within the Wynette North Study Area are listed in Table 8 and shown on Figure 7. The extent of GTREs are generally consistent with the DoR-mapped regulated vegetation mapping. Inconsistencies between the DoR-mapped and ground-truthed extents within the Wynette North Study Area include:

- Some portions of the DoR mapped non-remnant vegetation, such as those within the south-western extent of the Wynette North Study Area, were found to have structure and cover consistent with remnant vegetation
- Areas of DoR mapped RE 11.3.25 within the northern extent of the Wynette North Study Area were found to contain RE 11.3.4, occurring on a relictual alluvial ridge associated with the Isaac River and its tributaries
- Areas of DoR mapped RE 11.5.3 within the south-eastern extent of the Wynette North Study Area were found to be consistent with RE 11.5.9b; and
- DoR mapped heterogeneous polygons were not found to contain all the REs mapped.

Ground-truthed REs within the Wynette North Study Area comprise:

- four 'Endangered' REs
- three 'Of Concern' REs; and
- approximately 26.65 ha of remnant vegetation within the defined distance (i.e. 25 m) from the defining banks (i.e. watercourse RE).

Vegetation throughout the Wynette North Study Area exhibited infestations of several Queensland *Biosecurity Act 2014* and environmental weeds, including parthenium (*Parthenium hysterophorus*^{*}).

⁵ Weather data recorded at Moranbah Airport (weather station number 34035), 30 km north-west of Wynette North Study Area (BoM, 2020)



Table 8. Ground-truthed REs within the Wynette North Study Area

RE	BVG	Status		Vegetation description	Remnant (ha)	Non-remnant (ha)	Total (ha)
		VM Act ¹	Biodiversity Status ²				
11.3.1	25a	E	E	<i>Acacia harpophylla</i> woodlands (14 m) on alluvial flats with <i>Lysiphyllum hookeri</i> , <i>A. salicina</i> and <i>Eucalyptus coolabah</i> . A sparse shrub layer was present: <i>Atalaya hemiglauca</i> , <i>Lysiphyllum carronii</i> , <i>Terminalia oblongata</i> and juvenile canopy species. Ground layer contained native and exotic grasses: <i>Cenchrus ciliaris</i> *, <i>Enteropogon acicularis</i> , <i>Aristida</i> spp. and <i>Astrebla</i> sp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Harrisia martinii</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 5).	15.63	-	15.63
11.3.2	17a	OC	OC	<i>Eucalyptus populnea</i> woodlands (15 m) on alluvial flats. Tree canopy species included <i>Acacia salicina</i> and <i>A. excelsa</i> . A sparse shrub layer was present: <i>Cassia brewsteri</i> , <i>Acacia salicina</i> . Ground layer consisted of native and exotic grasses: <i>C. ciliaris</i> *, <i>Eragrostis</i> spp., <i>Melinis repens</i> * and <i>Aristida</i> spp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Harrisia martinii</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 6).	80.37	-	80.37
11.3.3	16c	OC	OC	<i>Eucalyptus coolabah</i> woodlands (16 m) on alluvial flats. Associated tree canopy species included <i>Corymbia tessellaris</i> . A sparse subcanopy containing juvenile <i>E. coolabah</i> , <i>Lysiphyllum hookeri</i> and <i>Acacia salicina</i> . Ground layer consisted of native forbs and grasses including <i>Cyperus</i> spp., <i>Phyllanthus</i> sp., <i>Waltheria indica</i> and <i>Eragrostis sororia</i> . Infestations of <i>Parthenium hysterophorus</i> * were also present throughout these areas (Photo 7).	3.55	-	3.55
11.3.4	16c	OC	OC	<i>Eucalyptus tereticornis</i> and <i>Corymbia clarksoniana</i> open woodland (18 m) on Quaternary alluvials. Other canopy species included <i>C. tessellaris</i> and <i>E. populnea</i> . Sparse shrub layer was present: <i>Grewia retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> . The understorey was dominated by exotic and native grasses: <i>C. ciliaris</i> *, <i>H. contortus</i> and <i>Aristida</i> spp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Lantana camara</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 8).	36.46	18.17 (regrowth)	54.63

RE	BVG	Status		Vegetation description	Remnant (ha)	Non-remnant (ha)	Total (ha)
		VM Act ¹	Biodiversity Status ²				
11.3.25	16a	LC	OC	Mixed eucalypt fringing riparian woodland (20 m) comprising <i>E. camaldulensis</i> , <i>E. coolabah</i> and <i>Acacia harpophylla</i> . A sparse shrub layer was present containing <i>Terminalia oblongata</i> , <i>Santalum lanceolatum</i> and <i>A. salicina</i> . The understorey was dominated by exotic and native grasses including <i>C. ciliaris</i> *, <i>H. contortus</i> and <i>Aristida</i> spp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Lantana camara</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 9).	15.67	-	15.67
11.3.27b	34d	LC	OC	Mixed eucalypt fringing riparian woodland (18 m) and ephemeral wetlands. Wooded areas were dominated by <i>E. populnea</i> , <i>E. coolabah</i> and <i>E. tereticornis</i> . Sparse shrub layer: <i>Atalaya hemiglaucula</i> , <i>Carissa ovata</i> and <i>A. salicina</i> . The understorey was dominated by exotic and native grasses including <i>C. ciliaris</i> *, <i>Eriochloa crebra</i> , <i>Leptochloa digitata</i> and <i>Eragrostis</i> spp. Unwooded areas contained native grasses and forbs such as <i>Paspalidium globoideum</i> , <i>Eriochloa crebra</i> and <i>Sida</i> spp. Infestations of <i>Parthenium hysterophorus</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 10).	17.47	-	17.47
11.4.8	25a	E	E	<i>Eucalyptus cambageana</i> woodlands (16 m) with subdominant <i>A. harpophylla</i> on gently undulating clay plains. The shrub layer comprised <i>Geijera parviflora</i> , <i>Carissa ovata</i> , <i>Capparis lasiantha</i> , <i>Archidendropsis basaltica</i> and <i>Alectryon diversifolius</i> . The understorey was dominated by exotic and native grasses including <i>C. ciliaris</i> *, <i>Ancistrachne uncinulata</i> and <i>Aristida</i> spp. Due to the dominance of <i>E. cambageana</i> , this community did not meet the condition criteria for the Brigalow TEC (Photo 11).	9.34	-	9.34
11.4.9	25a	E	E	<i>Acacia harpophylla</i> dominated woodlands and low woodlands on undulating clay plains. Associated canopy tree species included <i>Eucalyptus coolabah</i> and <i>Casuarina cristata</i> . The shrub layer contained <i>Atalaya hemiglaucula</i> , <i>Citrus glauca</i> , <i>Lysiphyllum carronii</i> , <i>Carissa ovata</i> and juvenile <i>A. harpophylla</i> . The ground layer was dominated by native and exotic grasses including <i>C. ciliaris</i> *, <i>Aristida</i> spp., <i>Sporobolus creber</i> and <i>S. caroli</i> . Due to the exotic species cover, this community did not meet the condition criteria for the Brigalow TEC (Photo 12).	4.16	6.49 regrowth 46.83 non-remnant	57.48

RE	BVG	Status		Vegetation description	Remnant (ha)	Non-remnant (ha)	Total (ha)
		VM Act ¹	Biodiversity Status ²				
11.5.3	17a	LC	NC	<i>Eucalyptus populnea</i> woodlands and open woodlands (to 15 m) on deep sandy plains. Associated species within the tree canopy included <i>Corymbia clarksoniana</i> and <i>C. tessellaris</i> . The sparse to moderate shrub layer contained <i>Cassia brewsteri</i> , <i>Archidendropsis basaltica</i> , <i>Alectryon diversifolius</i> , <i>Eremophila mitchelli</i> and <i>Carissa ovata</i> . The ground layer comprised native and exotic grasses including <i>C. ciliaris</i> *, <i>H. contortus</i> , <i>Enteropogon ramosa</i> and <i>Melinis repens</i> *. Infestations of <i>Parthenium hysterophorus</i> * and <i>Lantana camara</i> * were also present throughout these areas (Photo 13).	56.87	-	56.87
11.5.9b	18b	LC	NC	<i>Eucalyptus crebra</i> open woodland (16 m) with associated <i>Corymbia clarksoniana</i> on remnant surfaces. The sparse shrub layer comprised <i>Psyrax oleifolius</i> , <i>Capparis lasiantha</i> and <i>Acacia harpophylla</i> . The ground layer was dominated by native and exotic grasses (Photo 14).	173.30	-	173.30
11.5.15	7a	LC	E	Semi evergreen vine thicket of <i>Flindersia dissosperma</i> , <i>Denhamia oleaster</i> , <i>Geijera salicifolia</i> and <i>Diospyros humilis</i> . An emergent layer comprising <i>Eucalyptus crebra</i> and <i>E. populnea</i> was also present. The dense shrub layer comprised <i>Hovea longipes</i> , <i>Lysiphyllum carronii</i> , <i>Eremophila mitchellii</i> , <i>Petalostigma pubescens</i> and <i>Alectryon diversifolius</i> . The ground layer comprised native and exotic grasses including <i>C. ciliaris</i> *, <i>Aristida ramosa</i> , <i>A. calycina</i> , <i>Themeda triandra</i> and <i>Melinis repens</i> * (Photo 15). This RE is identified as the SEVT TEC under the EPBC Act.	2.53	-	2.53
11.5.17	34d	E	E	Mixed eucalypt woodlands (15 m) dominated by <i>E. tereticornis</i> with <i>E. populnea</i> and <i>Acacia salicina</i> . A sparse shrub layer was present containing <i>Grewia latifolia</i> and <i>A. salicina</i> . The understorey was dominated by native grasses including <i>Alloteropsis semialata</i> , <i>Heteropogon contortus</i> , <i>Eriochloa crebra</i> , <i>Enteropogon acicularis</i> and <i>Eragrostis</i> spp.	6.06	-	6.06
Non-remnant other				Vegetation not consistent with a particular RE.	-	21.31	21.31
Total					421.41	92.80	514.21

¹ VM Act class: E - endangered, OC - of concern, LC - least concern; ² Biodiversity Status: E - endangered, OC - of concern, NC - no concern at present

* Exotic weed species.



Photo 5. RE 11.3.1



Photo 6. RE 11.3.2



Photo 7. RE 11.3.3



Photo 8. RE 11.3.4



Photo 9. RE 11.3.25



Photo 10. RE 11.3.27b



Photo 11. RE 11.4.8



Photo 12. RE 11.4.9



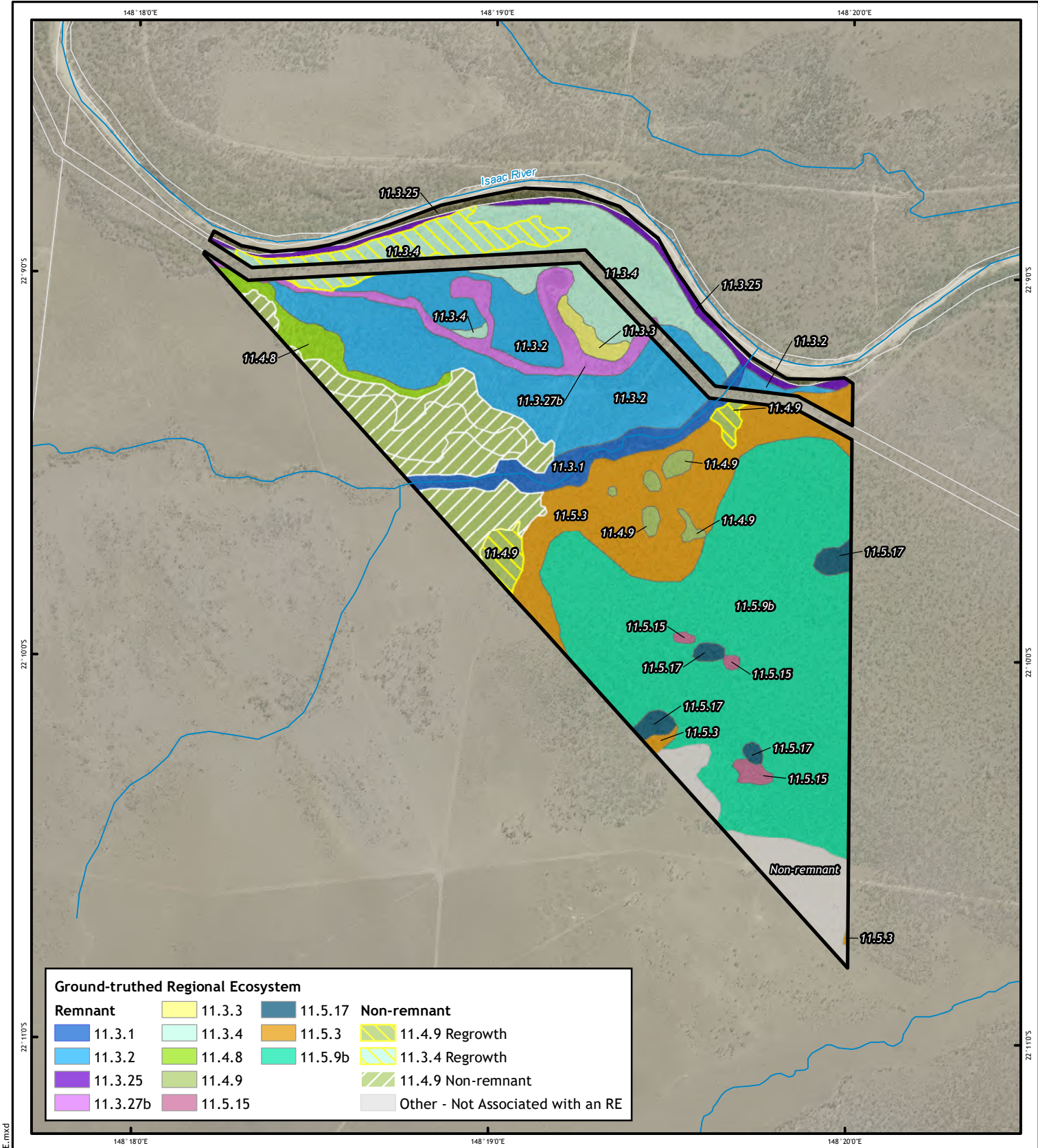
Photo 13. RE 11.5.3



Photo 14. RE 11.5.9b



Photo 15. RE 11.5.15



Ground-truthed Regional Ecosystem			
Remnant			Non-remnant
11.3.1	11.3.3	11.3.17	11.4.9 Regrowth
11.3.2	11.3.4	11.5.3	11.3.4 Regrowth
11.3.25	11.4.8	11.5.9b	11.4.9 Non-remnant
11.3.27b	11.4.9		Other - Not Associated with an RE
	11.5.15		

Legend

- Watercourse
- Cadastre
- Wynette North Study Area



Scale 1:25,000 (A4)

0 0.5 1
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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FIGURE 7: WYNETTE NORTH STUDY AREA GROUND-TRUTHED REGIONAL ECOSYSTEMS

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

4.2.2.2 Threatened Ecological Communities

4.2.2.2.1 Poplar Box TEC

No Poplar Box TEC was identified within the Wynette North Study Area during the field surveys. Approximately 80.37 ha of RE 11.3.2 was identified within the Wynette North Study Area, for which the vegetation communities did not currently meet all of the required threshold condition criteria to qualify as the Poplar Box TEC (Table 8; Figure 8). The RE 11.3.2 vegetation community was dominated by poplar box (*E. populnea*) with a crown cover of greater than 10% and evidence of recruitment of canopy species (a threshold criteria for the Poplar Box TEC). At the time of both the wet and dry season field surveys the ground layer was dominated by introduced grasses (>50% cover), including buffel grass (*Cenchrus ciliaris**), sabi grass (*Urochloa mosambicensis**) and red natal grass (*Melinis repens**), thereby excluding the vegetation community from presently qualifying as Classes A and B of the TEC. The density of mature trees across the extent of the community, averaging around 6 to 7 mature trees (>30 cm Diameter at Breast Height)/ha, was less than the required threshold (i.e. >10 mature trees/ha) to meet conditions for Class C of the Poplar Box TEC. Due to the density of exotic grasses within the ground layer, the average native species richness within the ground cover was also less than the Class C TEC threshold of 20 species, ranging between 6 to 13 species at each TEC assessment site. As such, the area containing RE 11.3.2 did not meet the Poplar Box TEC condition criteria.

While areas of RE 11.3.2 within the Wynette North Study Area did not currently meet the condition criteria for the Poplar Box TEC, active management to reduce the density of exotic grasses and promote native species recruitment may enable these areas to meet the Poplar Box TEC threshold criteria in the future.

4.2.2.2.2 Brigalow TEC

No Brigalow TEC was recorded within the Wynette North Study Area during the field surveys. Although several patches of REs associated with the Brigalow TEC were recorded, including REs 11.3.1, 11.4.8 and 11.4.9, these vegetation communities did not currently meet the Brigalow TEC condition criteria (Figure 8). This was largely attributed to the cover of exotic perennial species (≥50%) comprising buffel grass (*C. ciliaris**), Indian bluegrass (*Bothriochloa pertusa**) and sabi grass (*Urochloa mosambicensis**). An area of remnant RE 11.4.8 also comprised a canopy dominated by Dawson's gum (*Eucalyptus cambageana*) with brigalow (*Acacia harpophylla*) sub-dominant, excluding the area from the Brigalow TEC (Figure 8).

While areas of remnant and regrowth RE 11.4.9 and RE 11.3.1 (total 26.28 ha) did not currently meet the condition criteria for the Brigalow TEC, active management to reduce the density of exotic grasses and promote native species recruitment may enable areas to meet the requirements of the Brigalow TEC criteria in the future.

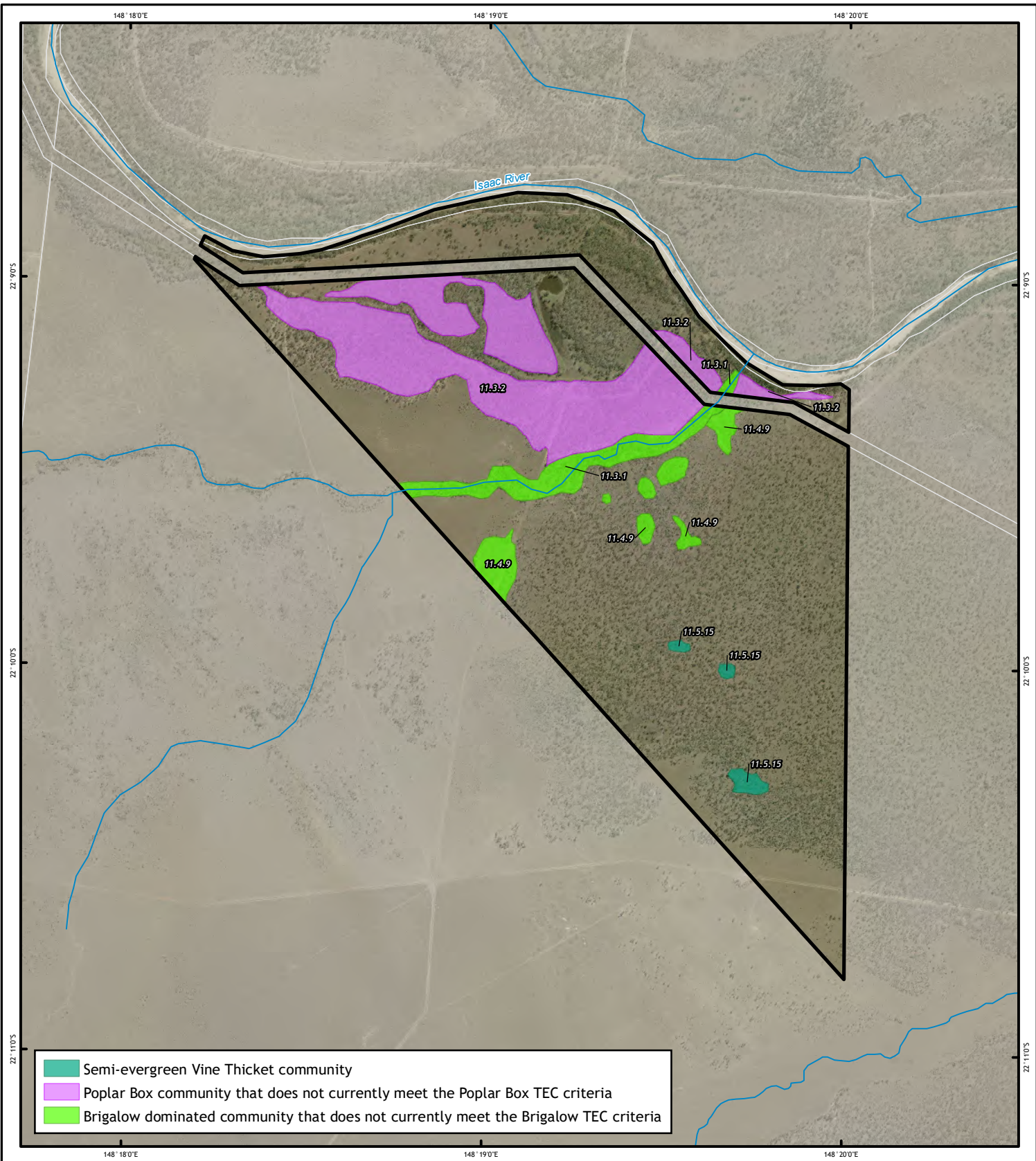
4.2.2.2.3 SEVT TEC

Three areas of remnant RE 11.5.15 were opportunistically identified within the Wynette North Study Area during field surveys and were identified to be SEVT TEC. The RE comprised a canopy (to 7 m) of *Flindersia dissosperma*, *Denhamia oleaster*, scrub wilga (*Geijera salicifolia*) and ebony (*Diospyros humilis*). Emergent narrow-leaved ironbark (*E. crebra*) and poplar box (*E. populnea*) were also present. The dense shrub layer comprised brush hovea (*Hovea longipes*), Queensland ebony (*Lysiphyllum carronii*), false sandalwood (*Eremophila mitchellii*), quinine (*Petalostigma pubescens*) and scrub boonaree (*Alectryon diversifolius*).

A total of 2.53 ha of the SEVT TEC was identified in the Wynette North Study Area as shown in Figure 8.



Document Path: X:\JOBS\2020\QEJ20054\GIS\QEJ20054_BOR_8_Wynette_TEC.mxd



- Semi-evergreen Vine Thicket community
- Poplar Box community that does not currently meet the Poplar Box TEC criteria
- Brigalow dominated community that does not currently meet the Brigalow TEC criteria

- Legend**
- Watercourse
 - Cadastre
 - Wynette North Study Area

N

Scale 1:25,000 (A4)

0 0.5 1

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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FIGURE 8: WYNETTE NORTH STUDY AREA THREATENED ECOLOGICAL COMMUNITIES
WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

Threatened Flora Species

No target threatened flora species were recorded during the field surveys; however, the Wynette North Study Area contains suitable habitat for *Solanum adenophorum*. *Solanum adenophorum* habitat occurs within brigalow (*Acacia harpophylla*) and gidgee (*A. cambagei*) woodlands on deep cracking clays (Bean, 2004) (Section 2.2.3). A small population of *S. adenophorum* was previously recorded within brigalow regrowth on clay plains (RE 11.4.9), approximately 5 km south of the Wynette North Study Area, during ecological surveys for the Winchester South Project (E2M, 2021).

Approximately 20 ha of potential habitat for *Solanum adenophorum*, associated with remnant and regrowth REs 11.4.8 and 11.4.9, is mapped within the Wynette North Study Area as depicted in Figure 9.

4.2.4 Threatened Fauna Species

Three target threatened fauna species were observed within the Wynette North Study Area: koala, greater glider and ornamental snake as well as potential habitat for the squatter pigeon (southern subspecies).

4.2.4.1 Koala (*Phascolarctos cinereus*)

Three koalas were observed within the Wynette North Study Area during the dry and wet season surveys (Photo 16). The observations were recorded within the remnant eucalypt woodland fringing the Isaac River (RE 11.3.4, 11.3.25 and RE 11.3.27b). Koala was also previously recorded within the Isaac River corridor as part of the Winchester South Project ecological surveys (E2M, 2021). Several historical records for the species are also located within and in proximity to the Wynette North Study Area (DES, 2020b). The Isaac River is a fauna movement corridor offering contiguous, remnant habitat in an otherwise largely fragmented landscape.

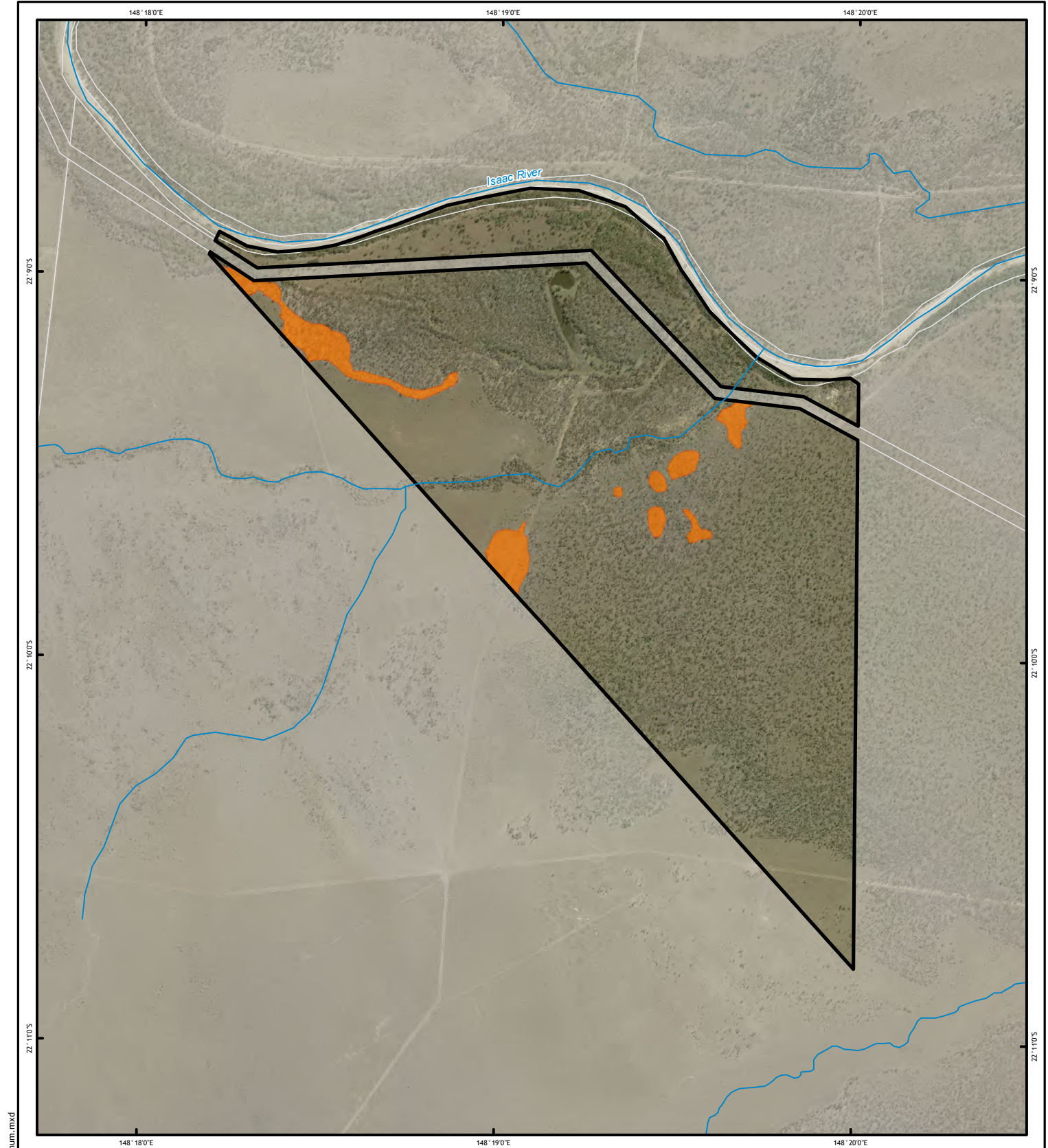
Studies of koala distribution, habitat utilisation and diet in central Queensland identified *Eucalyptus populnea*, *E. coolabah*, *E. tereticornis* and *E. crebra* or *E. drepanophylla* as key diet species for koalas in the region (Ellis et al., 2018; R. Melzer, 2014). *E. camaldulensis* and *E. tereticornis* is also considered to be a primary food tree for koalas within the Isaac Regional Council Local Government Area (Australian Koala Federation [AKF], 2015).

The koala habitat within the Wynette North Study Area is comprised of remnant and regrowth eucalypt woodland dominated by food trees (Figure 10). Koala habitat within the Wynette North Study Area is mapped within remnant REs 11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3, 11.5.9b, 11.5.17 and regrowth RE 11.3.4, equating to a combined total of 407.91 ha. Vegetation communities within the Wynette North Study Area are dominated by *A. harpophylla* (i.e. RE 11.4.9, 11.4.8 and 11.3.1), contained limited food trees and are not considered suitable habitat for the species. Similarly, areas containing disturbed, exotic grasslands were excluded from habitat areas due to limited food trees being present.

4.2.4.2 Greater glider (*Petauroides volans*)

Four greater glider observations were recorded during the dry season field survey while spotlighting within eucalypt woodlands on alluvial soils (Photo 16; Figure 11). Several historical records for the species, including those recorded during ecological surveys for the Winchester South Project (E2M, 2021), are also located within proximity to the Wynette North Study Area in association with the Isaac River corridor (DES, 2020b).





Legend

- Watercourse
- Cadastre
- Wynette North Study Area
- Potential *Solanum adenophorum* habitat



Scale 1:25,000 (A4)

0 0.5 1
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



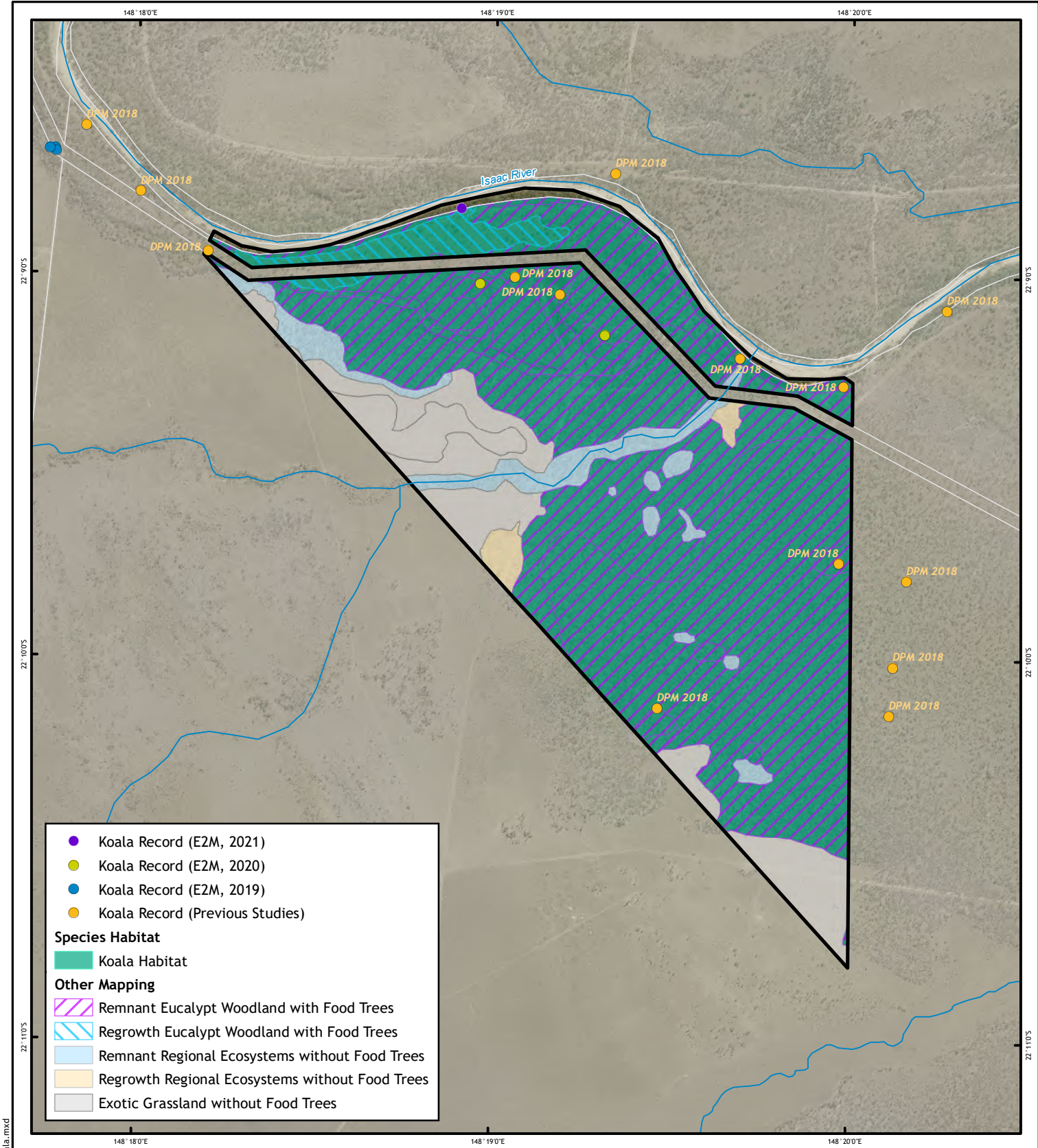
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FIGURE 9: WYNETTE NORTH STUDY AREA *SOLANUM ADENOPHORUM* POTENTIAL HABITAT WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3



Legend

- Watercourse
- Cadastre
- Wynette North Study Area

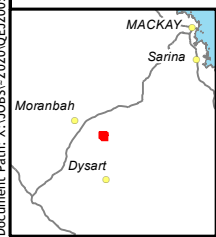


Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DNRME 2018, Whitehaven 2019
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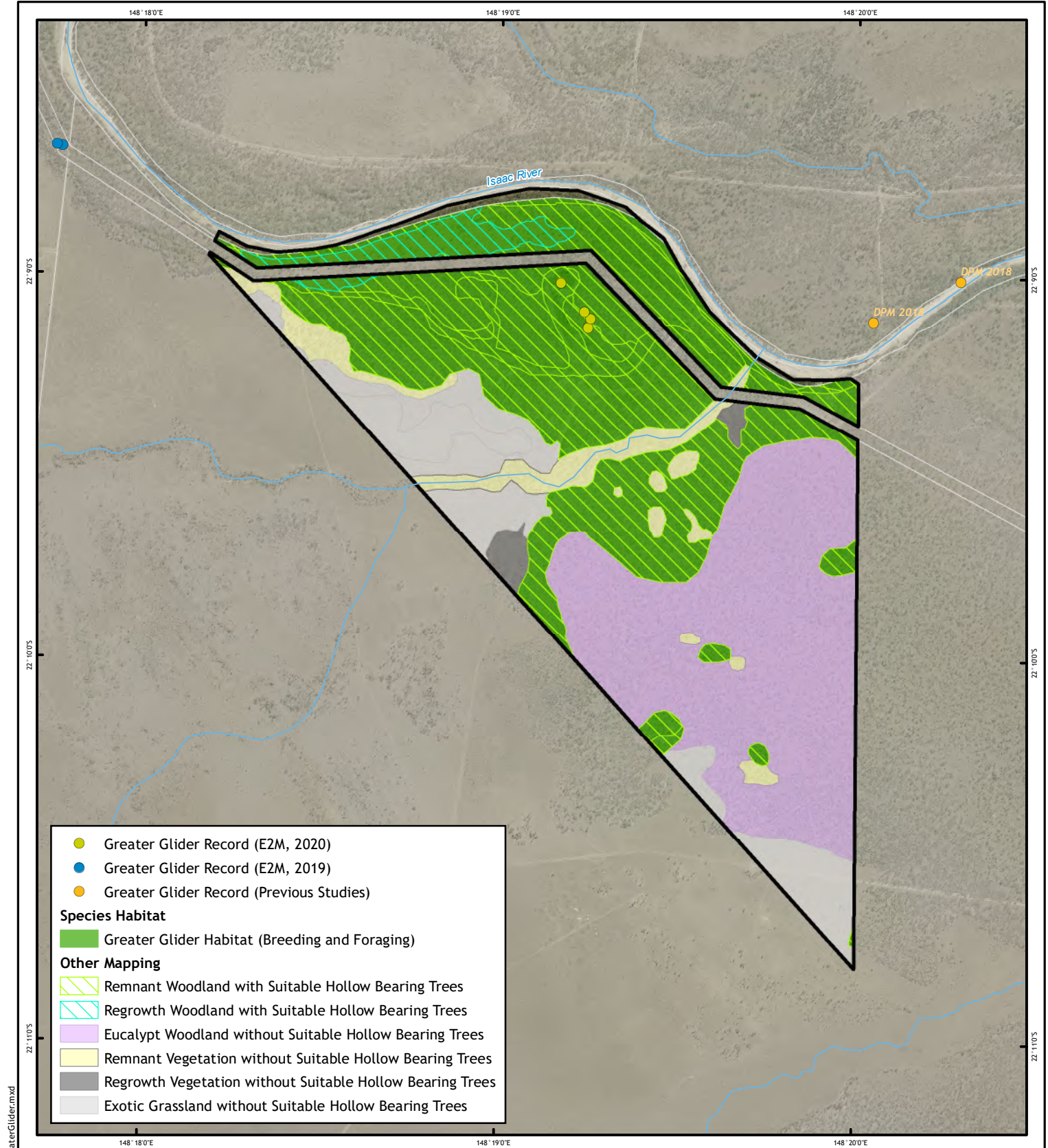
3	Issued for Use	DL	BD	05/07/2022
1	Issued for Use	DL	PW	Potential
Rev	Description	Drawn	Approved	Date



FIGURE 11: WYNETTE NORTH STUDY AREA KOALA HABITAT

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3



Legend

- Watercourse
- Cadastre
- Wynette North Study Area



Scale 1:25,000 (A4)

0 0.5 1
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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1	Issued for Use	DL	PW	13/09/2021
Rev	Description	Drawn	Approved	Date



FIGURE 11: WYNETTE NORTH STUDY AREA GREATER GLIDER HABITAT

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3



Photo 16: Koala (left) and greater glider (right) observed within the Wynette North Study Area during the dry season field survey

Greater glider habitat is largely restricted to eucalypt forests and woodlands. The species diet comprises mostly eucalypt leaves and sometimes eucalypt flowers (TSSC, 2022). During the day, greater gliders shelter in large tree hollows and a strong correlation exists between the number of large hollows abundance and the number of greater gliders (Andrews et al., 1994). They are typically found at their highest abundance in montane, moist eucalypt forests that are mature and have large trees with hollows (TSSC, 2022). The greater glider also favours a diverse range of eucalypt species within their local range because of variability in food preference across seasons (Kavanagh, 1984).

Suitable habitat for the species within the Wynette North Study Area was observed in association with eucalypt dominated woodlands containing large hollows. Greater glider habitat is mapped as remnant REs with low fragmentation and high abundances of hollow-bearing trees (REs 11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3 and 11.5.17) and equates to a total of approximately 216.45 ha within the Wynette North Study Area (Figure 11).

Areas of eucalypt woodland, remnant vegetation and regrowth without suitable hollows are also mapped on Figure 11 and are not considered to currently form potential habitat for the greater glider.

4.2.4.3 Squatter pigeon (southern subspecies) (*Geophaps scripta scripta*)

Squatter pigeon (southern subspecies) was not recorded within the Wynette North Study Area during either of the two field assessments: however, the species was detected within the broader Wynette property and the adjacent Winchester South Project area (E2M, 2021; DPM, 2018a).

Squatter pigeon (southern subspecies) foraging and breeding habitat consists of remnant or regrowth open-forest to sparse, open-woodland or low-woodland dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species on:

- well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. land zone 5); and
- lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. land zone 7) (DAWE, 2020b; Squatter Pigeon Workshop, 2011).



Squatter Pigeon habitat is distinguished by ground-layer vegetation that:

- consists of patchy, native, perennial tussock grasses, or a mix of perennial tussock grasses and low shrubs or forbs; and
- does not cover more than 33% of the ground (DAWE, 2020b; Squatter Pigeon Workshop, 2011).

Squatter Pigeon foraging habitat is within 3 km of a suitable, permanent or seasonal waterbody, while breeding habitat is located within 1 km of a suitable, permanent waterbody (DAWE, 2020b; Squatter Pigeon Workshop, 2011). Seasonal waterbodies are present within and adjacent to the Wynette North Study Area (Figure 9) in the form of drainage lines and more permanent water sources such as farm dams (Section 3.2.5.1).

Dispersal habitat is any area (<100 m wide) located between patches of foraging habitat, breeding habitat and/or waterbodies which facilitates movement. Dispersal habitat includes vegetation where the groundcover layer has been thinned through current land use practices in a way that suits the species (e.g. light cattle grazing). The species does disperse into highly modified or degraded habitats, including cleared areas which are within 100 m of remnant trees or patches of habitat.

Suitable habitat on Land zone 5 within the Wynette North Study Area includes vegetation communities:

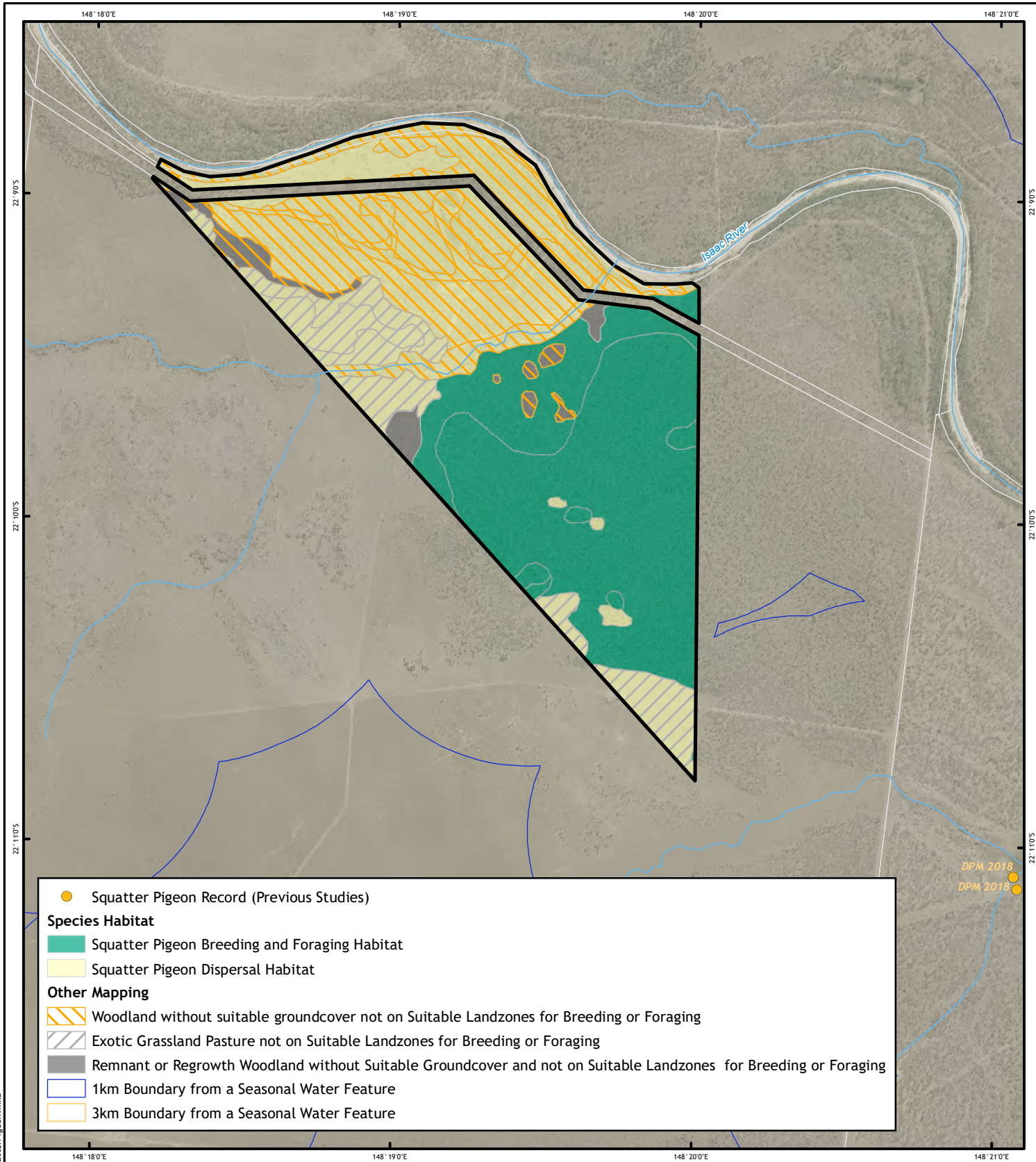
- RE 11.5.3 (remnant)
- RE 11.5.9b (remnant); and
- RE 11.5.17 (remnant).

Within the Wynette North Study Area squatter pigeon (southern subspecies) foraging habitat was mapped within 3 km of a suitable, permanent or seasonal waterbody (Figure 12). Breeding habitat was mapped within 1 km of permanent water (Figure 12). Dispersal habitat was mapped as any vegetation community (remnant, non-remnant or regrowth) located between patches of foraging and/or breeding habitat (including exotic grassland pasture) less than 100 m wide between suitable foraging and breeding habitat.

The mapping on Figure 12 excludes exotic (or native) grassland pasture greater than 100 m wide between suitable foraging and breeding habitat as well as woodland (and regrowth woodland) without suitable groundwater or not on land zones suitable for foraging and breeding.

There is approximately 236.23 ha of breeding and foraging habitat, and 257.98 ha of dispersal habitat for the squatter pigeon (southern subspecies) within the Wynette North Study Area.





4.2.4.4 Ornamental snake (*Denisonia maculata*)

One ornamental snake was observed within the Wynette North Study Area during the wet season survey within non-remnant vegetation characterised by gilgai and clay soils, characteristic of RE 11.4.9 (Photo 17).

The microhabitat features of ornament snake habitat are characterised by DAWE (2021b) as containing:

- gilgai of varying depth (shallow to deep) with cracking clay soils (cracks depth varied between shallow and deep)
- coarse woody debris and/or ground litter
- regrowth brigalow (dominant)
- weeds, most frequently parthenium
- presence of native amphibians; and
- contiguous habitat patches.

Ornamental snake habitat within the Wynette North Study Area is mapped in Figure 13. Approximately 70.76 ha of ornamental snake habitat was identified within the Wynette North Study Area and is associated with:

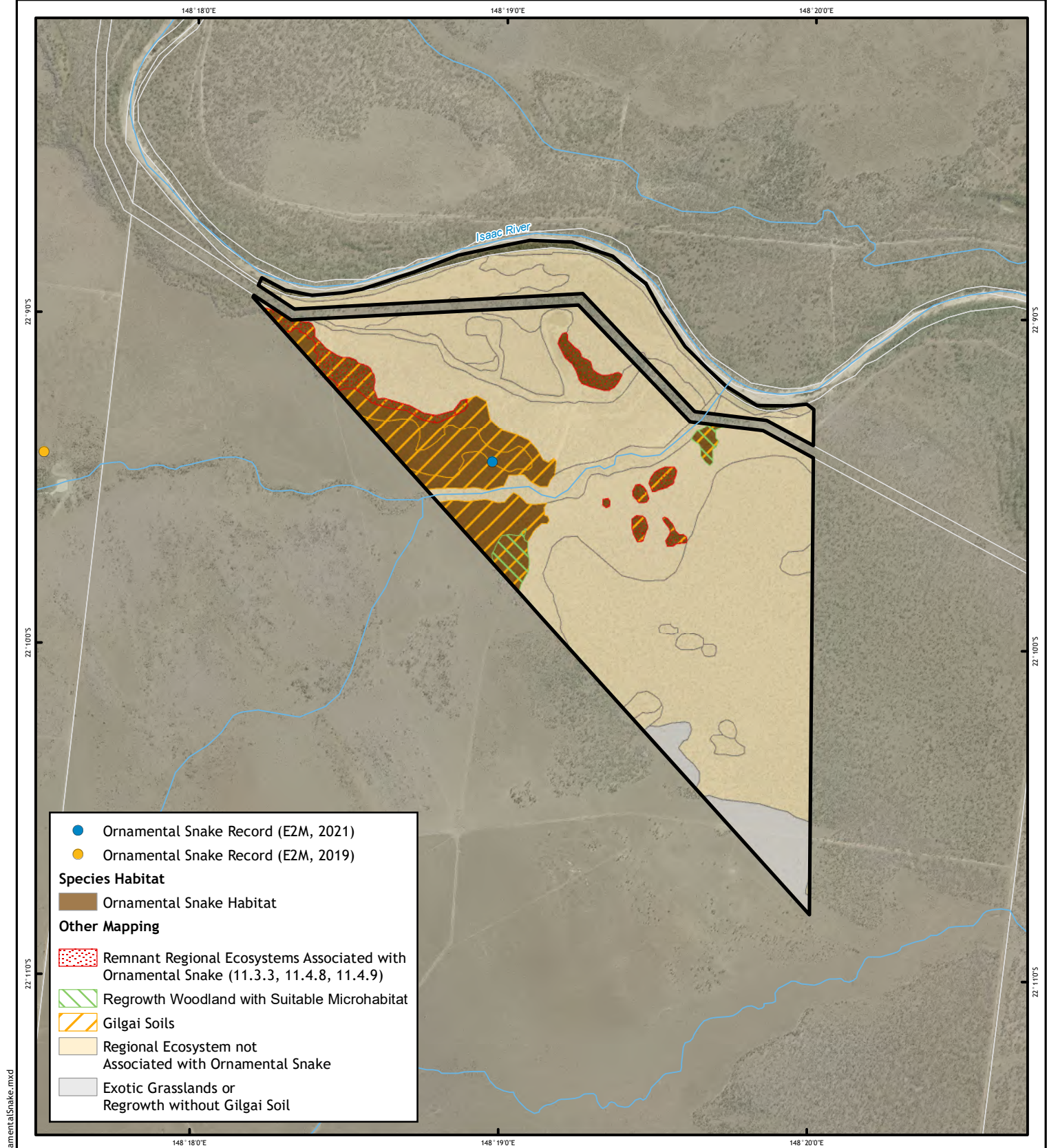
- RE 11.3.3
- RE 11.4.8
- RE 11.4.9; and
- non-remnant vegetation with gilgai and clay soils.

The mapping on Figure 13 excludes REs not associated with the ornamental snake and exotic grasslands without gilgai soils.



Photo 17: Ornamental snake habitat (left) and ornamental snake observed during the wet season survey within the Wynette North Study Area (right)





Legend

- Watercourse
- Cadastre
- Wynette North Study Area



Scale 1:29,000 (A4)

0 0.5 1
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator

Notes:
Aerial Imagery: © DNRME 2018, Whitehaven 2019
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FIGURE 13: WYNETTE NORTH STUDY AREA ORNAMENTAL SNAKE HABITAT

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

4.2.5 Ecological Function

4.2.5.1 Waterway and Wetland Features

The Isaac River (SO 6) corridor is characterised by a wide, meandering channel. The corridor comprises steep, incised banks with a deep, sandy bed. A few minor drainage features (SO1 and SO2) are also present within the Wynette North Study Area that feed into the Isaac River.

The Wynette North Study Area contains approximately 26.16 ha of remnant vegetation within the defined distance from the defining banks of a watercourse and qualifies as a MSES. This MSES fringes the two main watercourses within and adjacent to the Wynette North Study Area, including the Isaac River (Figure 14).

No MSES high ecological significant (HES) wetlands are present within the Wynette North Study Area.

4.2.5.2 Connectivity

Non-remnant areas are able to be used to offset connectivity impacts when located within the same subregion according to the Queensland *Environmental Offsets Policy*. A total of two non-remnant ecosystems (comprising regrowth and disturbed vegetation associated with a RE) were ground-truthed within the Wynette North Study Area (Figure 14 and listed in Table 8). The Wynette North Study Area spans two subregions of the Brigalow Belt Bioregion, the Isaac-Comet Downs and Northern Bowen Basin subregions.

4.3 MNES and MSES Summary

The Wynette North Study Area supports a number of ecological values which form MNES values identified under the EPBC Act, including:

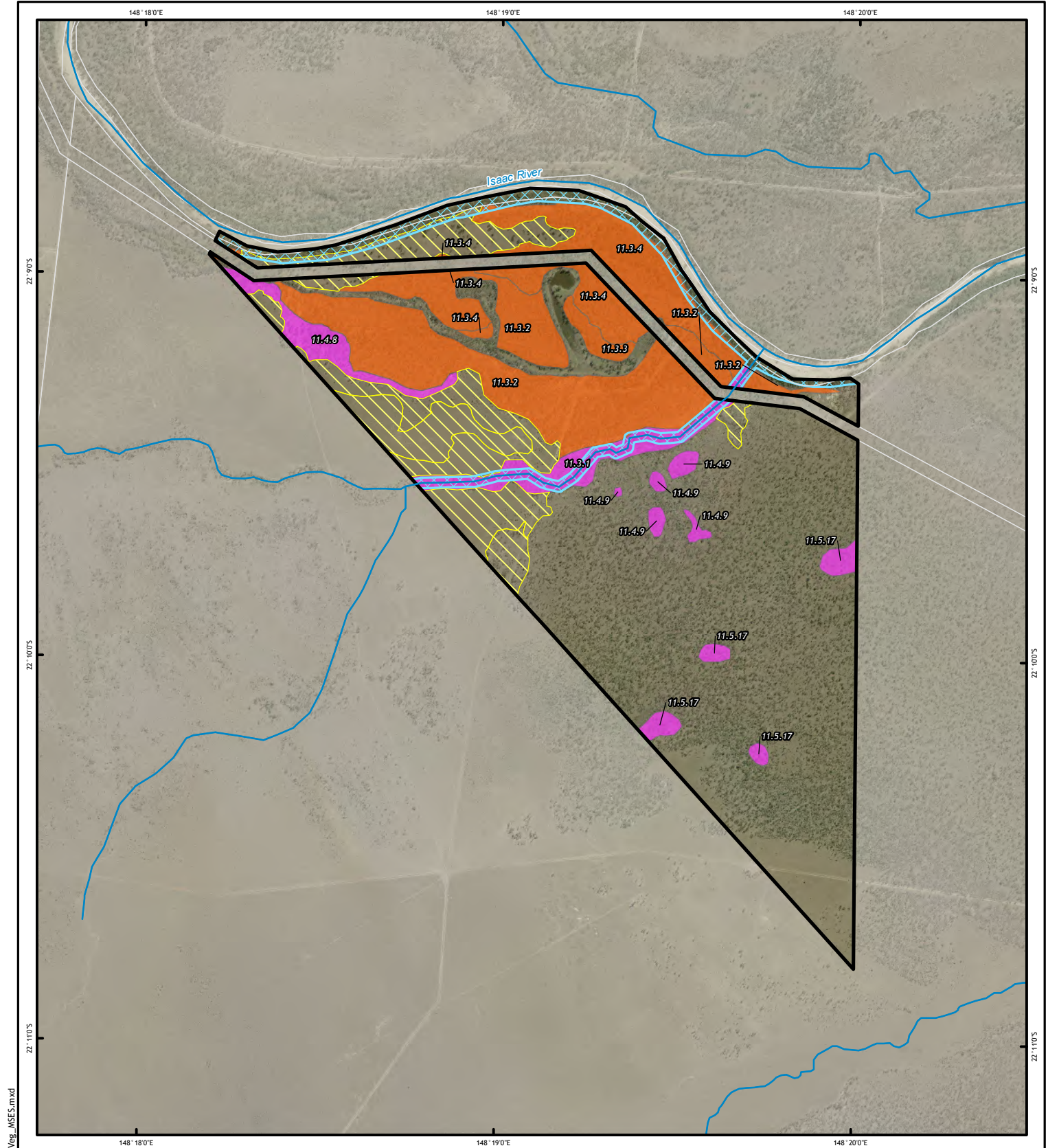
- SEVT TEC
- habitat for target threatened species known to occur, including the koala, greater glider and ornamental snake; and
- Suitable habitat for target threatened species likely to occur, including the squatter pigeon (southern subspecies).

Areas within the Wynette North Study Area containing Poplar Box woodland (RE 11.3.2) and Brigalow dominated communities (RE 11.3.1 and 11.4.9) did not currently meet condition criteria for the Poplar Box TEC and Brigalow TEC listed under the EPBC Act. However, through active management, particularly targeted weed and grazing management, these areas may meet necessary condition thresholds in the future.

A number of ground-truthed MSES values under the Queensland *Environmental Offset Act 2014* (EO Act) were also identified within the Wynette North Study Area, including:

- MSES Regulated Vegetation, comprising:
 - ‘Endangered’ and ‘Of Concern’ REs; and
 - prescribed REs located within a defined distance from the defining banks of a mapped watercourse
- protected wildlife habitat for targeted threatened species known to occur (i.e. species detected during field surveys), including koala, greater glider and ornamental snake





Legend

- Watercourse
- Cadastre
- Wynette North Study Area
- Regulated Vegetation
- Endangered Regional Ecosystem
- Of Concern Regional Ecosystem
- Regional ecosystems within the defined distance from the defining banks of a relevant watercourse
- Connectivity



Scale 1:25,000 (A4)

0 0.5 1
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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FIGURE 14: WYNETTE NORTH STUDY AREA MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	3

- protected wildlife habitat for targeted threatened species likely to occur (i.e. species habitat present and records within the broader area, but not detected during the field survey), including squatter pigeon and *Solanum adenophorum*; and
- connectivity areas.

A summary of the relevant MNES and MSES values identified within the Wynette North Study Area is provided in Table 9.

Table 9. MNES and MSES Recorded within the Wynette North Study Area

Environmental matter	Relevant RE(s)	Broad condition class	Area available within the Wynette North Study Area (ha)
MNES known to occur			
koala (<i>Phascolarctos cinereus</i>)	11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3, 11.5.9b and 11.5.17	remnant and non-remnant (regrowth)	407.91
greater glider (southern and central) (<i>Petauroides volans</i>)	11.3.2, 11.3.3, 11.3.4, 11.3.25, 11.3.27b, 11.5.3 and 11.5.17	remnant and non-remnant (regrowth)	216.45
ornamental snake (<i>Denisonia maculata</i>)	11.3.1, 11.3.3, 11.4.8 and 11.4.9	remnant and non-remnant (regrowth and other)	70.76
SEVT TEC	11.5.15	remnant	2.53
MNES likely to occur			
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	11.5.3, 11.5.9b and 11.5.17	remnant and non-remnant (regrowth)	236.23 breeding and foraging
MSES known to occur (including the MNES above)			
Endangered RE (BVG 25a)	11.3.1, 11.4.8 and 11.4.9	remnant	29.13
Endangered RE (BVG34d)	11.5.17	remnant	6.06
Of Concern RE (BVG17a)	11.3.2	remnant	80.37
Of Concern RE (BVG16c)	11.3.3 and 11.3.4	remnant	40.01
Watercourse RE (BVG 25a)	11.3.1	remnant	9.09
Watercourse RE (BVG 17a)	11.3.2 and 11.5.3	remnant	0.27
Watercourse RE (BVG 16c)	11.3.4	remnant	2.09
Watercourse RE (BVG 16a)	11.3.25	remnant	14.71
Connectivity Areas (Northern Bowen Basin and Isaac-Comet Downs subregions)	11.3.4 and 11.4.9	non-remnant (regrowth)	71.49
MSES potential to occur			
<i>Solanum adenophorum</i>	11.4.8 and 11.4.9	remnant and non-remnant (regrowth)	19.99



4.4 Habitat Quality Assessment Results

4.4.1 Landscape-scale Attribute Score

A summary of landscape-scale attribute scores for the Wynette North Study Area are summarised in Table 10. The Wynette North Study Area is located within a largely fragmented landscape; however, the Wynette North Study Area is adjacent to areas of remnant vegetation associated with the Isaac River corridor. The Wynette North Study Area has a total landscape-scale attribute score of 19 out of 20.

Table 10. Wynette North Study Area Landscape-scale Attribute Scores

Landscape attribute	Comment	Score
Patch size	>500 ha of remnant	10
Connectivity	45% remnant adjacent and >500 ha remnant	5
Context	47% remnant	4
Ecological Corridors	Located partially within a mapped Biodiversity corridors (state riparian corridor)	-
Total		19

4.4.2 Site-based Attribute Scores

A total of 34 site-based attribute assessments (i.e. BioCondition survey sites) were undertaken across the 14 AUs identified within the Wynette North Study Area and adjacent areas representative of vegetation present (Figure 3). Site-based condition data for Wynette North Study Area is provided in Appendix B.2.

AUs were characterised by vegetation height, cover, and species consistent with the BioCondition Benchmarks. The vegetation conditions within the Wynette North Study Area AUs were of poor to moderate condition with scores ranging from 1.94 to 7.5 (max score of 10) when compared to their benchmark. Habitat Quality assessments were typically of a lower quality within regrowth and degraded vegetation areas. Site condition attributes leading to a reduction in Habitat Quality scores included:

- low native grass and native forb species richness and cover, potentially due to the introduction of exotic pasture species for livestock grazing
- canopy tree height and cover
- high non-native plant cover, particularly from non-native grasses and forbs, including buffel grass (*Cenchrus ciliaris**), *Harrisia martini*, *Lantana camara*, and *Parthenium hysterophorus** (parthenium); and
- low coarse woody debris cover, potentially due to grazing management and historical clearing (selective) and thinning of large trees.

Although the overall vegetation condition within the Wynette North Study Area has been degraded by cattle grazing and weeds, habitat for threatened species remains present.

A summary of MNES and MSES Habitat Quality scores are provided in Table 11.



Table 11. Wynette North Study Area Summary of Site-based Attribute Scores

Environmental Matter	Relevant RE(s)	Broad condition state	AU	Area (ha)	Average site-based attribute score (/10)
MNES known to occur					
koala (<i>Phascolarctos cinereus</i>)	11.3.2	remnant	2	80.37	6.12
	11.3.4	remnant	4	36.46	
	11.3.4	regrowth	5	18.17	
	11.3.25	remnant	6	15.67	
	11.3.27b	remnant	7	17.47	
	11.3.3	remnant	3	3.55	
	11.5.3	remnant	12	56.87	
	11.5.9b	remnant	13	173.30	
	11.5.17	remnant	14	6.06	
greater glider (southern and central) (<i>Petauroides volans</i>)	11.3.2	remnant	2	80.37	6.14
	11.3.3	remnant	3	3.55	
	11.3.4	remnant	4	36.46	
	11.3.25	remnant	6	15.67	
	11.3.27b	remnant	7	17.47	
	11.5.3	remnant	12	56.87	
	11.5.17	remnant	14	6.06	
ornamental snake (<i>Denisonia maculata</i>)	11.3.1	remnant	1	15.63	3.70
	11.4.8	remnant	8	9.34	
	11.4.9	remnant	9	4.16	
	11.4.9	regrowth	10	6.49	
	11.4.9	non-remnant	11	46.83	
SEVT TEC	11.5.15	remnant	-	2.53	No BioCondition Assessments undertaken ⁶
MNES likely to occur					
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	11.5.3	remnant	12	56.87	6.34
	11.5.9b	remnant	13	173.30	
	11.5.17	remnant	14	6.06	

⁶ No BioCondition Assessments were conducted within SEVT as this community was not a target environmental matter



Environmental Matter	Relevant RE(s)	Broad condition state	AU	Area (ha)	Average site-based attribute score (/10)
MSES known to occur					
koala (<i>Phascolarctos cinereus</i>)	Refer to MNES known to occur				
greater glider (southern and central) (<i>Petauroides volans</i>)	Refer to MNES known to occur				
ornamental snake (<i>Denisonia maculata</i>)	Refer to MNES known to occur				
Endangered RE (BVG 25a)	11.3.1	remnant	1	15.63	6.08
	11.4.8	remnant	8	9.34	
	11.4.9	remnant	9	4.16	
Endangered RE (BVG 34d)	11.5.17	remnant	14	6.06	5.97
Of Concern RE (BVG 17a)	11.3.2	remnant	2	80.37	5.94
Of Concern RE (BVG 16c)	11.3.3	Remnant	3	3.55	5.15
	11.3.4	remnant	4	36.46	
Watercourse RE (BVG 25a)	11.3.1	remnant	1	9.09	5.78
Watercourse RE (BVG 17a)	11.3.2	remnant	2	0.22	6.06
	11.5.3	remnant	12	0.05	
Watercourse RE (BVG 16a)	11.3.25	remnant	6	14.71	6.88
Watercourse RE (BVG 16c)	11.3.4	remnant	4	2.09	5.06
MSES likely to occur					
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	Refer to MNES likely to occur				
<i>Solanum adenophorum</i>	11.4.8	remnant	8	9.34	5.99
	11.4.9	remnant	9	4.16	
	11.4.9	regrowth	10	6.49	

4.4.3 Fauna Species-based Attribute Scores

Species habitat attributes, Table 12, indicate the ability of the area of matter to support a fauna species based on their specific habitat requirements. Each individual score is out of 25. Fauna species-based condition data for the Wynette North Study Area is provided in Appendix C.



Table 12. Wynette North Study Area Fauna Species-based Attribute Score Summary

Species	Habitat attribute	Indicator	Score
greater glider (southern and central) (<i>Petauroides volans</i>)	Quality and availability of food and habitat required for foraging	Abundance of food trees/eucalyptus	25
	Quality and availability of habitat required for shelter and breeding	Abundance of large hollows	20
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation	20
		Average patch size	25
	Threat abundance	Historical clearing/fragmentation	15
		Bushfire risk (low)	10
		Barbwire entanglement risk	10
Habitat Quality Score		8.1/10	
koala (<i>Phascolarctos cinereus</i>)	Quality and availability of food and habitat required for foraging	Abundance of koala food trees (<i>Eucalyptus</i> spp.)	25
	Quality and availability of habitat required for shelter and breeding	Abundance of koala shelter trees/DBH>30cm	20
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation	15
		Historical clearing/fragmentation	15
	Threat abundance	Abundance of feral dogs	5
		Vehicle strike risk	20
		Habitat Quality Score	
ornamental snake (<i>Denisonia maculata</i>)	Quality and availability of food and habitat required for foraging	Abundance of amphibians	15
		Presence of water	12.5
	Quality and availability of habitat required for shelter and breeding	Soil crack abundance	15
		Soil crack depth	20
		Abundance of woody debris	5
		Litter abundance	10
	Quality and availability of habitat required for mobility	Average patch size	20
	Threat abundance	Historical clearing	5
		Cane toad abundance	5
		Habitat degradation/ cattle tramping	5
Habitat Quality Score		5.2/10	



Species	Habitat attribute	Indicator	Score
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	Quality and availability of food and habitat required for foraging	Vegetation condition (remnant, non-remnant, regrowth)	25
	Quality and availability of habitat required for shelter and breeding	Average distance to water	12.5
	Quality and availability of habitat required for mobility	N/A	-
	Threat abundance	Historical clearing	15
		Cattle abundance	10
		Abundance of pests (feral dogs/cats)	10
		Habitat Quality Score	



5 Conclusion

The field surveys undertaken by E2M ecologists across both the Inderi and Wynette North Study Areas successfully identified a number of known and potential target MNES and MSES values. Table 13 below outlines the relevant MNES and MSES identified and the associated extent present within each Study Area.

Table 13. Wynette North Study Area Summary of Findings for all Relevant MNES and MSES

Matter	RE	Study Area	
		Inderi Habitat area (ha)	Wynette North Habitat Area (ha)
MNES			
Brigalow TEC	11.3.1, 11.4.8 and 11.4.9	0	0 (26.28 ha of lower condition woodland with potential to become TEC)
Natural Grasslands TEC	11.8.11	227.74 (and 136.91 ha of lower condition natural grasslands with potential to become TEC)	0
Poplar Box TEC	11.3.2	0	0 (and 80.37 ha of lower condition woodland with potential to become TEC)
SEVT TEC	11.5.15	0	2.53
<i>Dichanthium queenslandicum</i>	11.8.11 and 11.8.5	519.73	0
<i>Dichanthium setosum</i>	11.8.11 and 11.8.5	519.73	0
koala (<i>Phascolarctos cinereus</i>)*	Various	0	407.91
Greater glider (southern and central) (<i>Petauroides volans</i>)*	Various	0	216.45
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)*	Various	0	236.23 breeding and foraging
Ornamental snake (<i>Denisonia maculata</i>)*	Various	0	70.76
MSES			
Endangered RE	11.3.1 (BVG 25a)	0	15.63
	11.4.8 (BVG 25a)	0	9.34
	11.4.9 (BVG 25a)	0	4.16
	11.5.17 (BVG 34d)	0	6.06
Of Concern RE	11.3.2 (BVG 17a)	0	80.37



Matter	RE	Study Area	
		Inderi Habitat area (ha)	Wynette North Habitat Area (ha)
	11.3.3 (BVG 16c)	0	3.55
	11.3.3a (BVG 21b)	10.57	0
	11.3.4 (BVG 16c)	0	36.46
	11.8.11 (BVG 30b)	227.74	0
Watercourse RE	11.3.1 (BVG 25a)	0	9.09
	11.3.2 (BVG 17a)	0	0.22
	11.3.3a (BVG 21b)	10.91	0
	11.3.4 (BVG 16c)	0	2.09
	11.3.25 (BVG 16a)	0	14.71
	11.4.8 (BVG 25a)	0	0
	11.5.3 (BVG 17a)	0	0.05
	11.8.5 (BVG 11a)	2.66	0
	11.8.11 (BVG 30b)	9.55	0
	Non-remnant associated with a RE	254.37	71.49
<i>Solanum adenophorum</i> potential habitat	11.4.9 (BVG 25a)	0	19.99

* Note: Species are both MNES and MSES



6 References

Andrews, S. P., Gration, G., Quin, D., & Smith, A. P. (1994). *Description and assessment of forestry impacts on fauna of the Urbenville Forestry Management Area*. Report for State Forests of New South Wales.

Atlas of Living Australia (ALA). (2020). Available from <https://www.ala.org.au/>

Australian Koala Foundation. (2015). *Australian Koala Foundation National Koala Tree Planting List*. Australian Koala Foundation.

Bean, A. R. (2004). The taxonomy and ecology of *Solanum subg. Leptostemonum* (Dunal) Bitter (Solanaceae) in Queensland and far north-eastern New South Wales, Australia. *Austrobaileya* 6(4): 784-785.

Bureau of Meteorology (BoM) (2020). Available from: <http://www.bom.gov.au/climate/data/?ref=ft>

Butler, D.W. (2007). *Recovery Plan for the Brigalow (Acacia harpophylla) dominant and co-dominant Endangered Ecological Community* (draft of 1 May 2007). Report to the Department of the Environment and Water Resources, Canberra. Queensland National Parks and Wildlife Service, Brisbane. Commonwealth of Australia. *Style Manual*.

Cropper, S. (1993). *Management of Endangered Plants*. East Melbourne: CSIRO Publishing.

Department of Agriculture, Water and the Environment (DAWE). (2021a). EPBC Act Protected Matters Search Tool. Available from: <http://www.environment.gov.au/epbc/pmst/>

Department of Agriculture, Water and the Environment (DAWE). (2021b). *Species Profile and Threats (SPRAT) Database*. Available from: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Department of Environment and Science (DES) (2018). *Regional Ecosystem Technical Descriptions for the Brigalow Belt*. Brisbane: State of Queensland. Available from: <file:///C:/Users/Lwilkie/Downloads/brigalow-belt-7-12.pdf>.

Department of Environment and Science (DES). (2020). *Guide to determining terrestrial habitat quality. Methods for assessing habitat quality under the Queensland Environmental Offsets Policy Version 1.3*. Brisbane: State of Queensland. Available from: https://environment.des.qld.gov.au/__data/assets/pdf_file/0017/102833/habitat-qualityassessment-guide-v1-3.pdf

Department of Environment and Science (DES) (2021a). Matters of State Environmental Significance (MSES) Report. Available from: <https://www.qld.gov.au/environment/pollution/management/environmental-reports-online>.

Department of Environment and Science (DES). (2021b). Wild Net Wildlife Online Database Search. Available from: <https://www.data.qld.gov.au/dataset/wildnet-wildlife-records-published-queensland>

Department of Environment and Science (DES). (2021c). Queensland Statewide Corridors [Map]. Available from: <https://www.data.qld.gov.au/dataset/queensland-statewide-corridors>



Department of the Environment (DotE) (2013). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) Ecological Community*. Canberra: Department of the Environment. Available from:
<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservationadvice.pdf>.

Department of the Environment (DotE) (2014). *EPBC Act referral guidelines for the vulnerable koala*. Canberra: Department of the Environment. Available from:
<https://www.environment.gov.au/system/files/resources/dc2ae592-ff25-4e2c-ada3-843e4dea1dae/files/koala-referral-guidelines.pdf>.

Department of the Environment, Water, Heritage and the Arts (DEWHA). (2010). *Survey guidelines for Australia's threatened birds*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: <https://www.environment.gov.au/system/files/resources/107052eb-2041-45b9-9296-b5f514493ae0/files/survey-guidelines-birds-april-2017.pdf>.

Department of Natural Resources, Mines and Energy (DNRME). (2020a). *Vegetation Management Report*. Department of Natural Resources, Mines and Energy. Available from:
<https://www.resources.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

Department of Natural Resources, Mines and Energy (DNRME). (2020b). *Queensland Detailed Surface Geology*. Department of Natural Resources, Mines and Energy.

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011a). *Draft referral guidelines for the nationally listed Brigalow Belt reptiles*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from:
<https://www.environment.gov.au/system/files/resources/570964ac-15bf-4e07-80da-848fead7b0cd/files/draft-referral-guidelines-comment-brigalow-reptiles.pdf>

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011b). *Survey guidelines for Australia's threatened reptiles*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from:
<https://www.environment.gov.au/system/files/resources/eba674a5-b220-4ef1-9f3ab9ff3f08a959/files/survey-guidelines-reptiles.pdf>

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011c). *Survey guidelines for Australia's threatened mammals*. Canberra: Department of Sustainability, Environment, Water, Population and Communities.

Ellis, FitzGibbon, Barth, et al., (2018). *Koalas of the Clarke Connors Range: Final report of progress October 2018*. Koala Ecology Group, Brisbane.

Eyre T.J., Ferguson D.J., Hourigan C.L., Smith G.C., Mathieson M.T., Kelly, A.L., Venz M.F., Hogan, L.D. and Rowland, J. (2018). *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland*. Department of Environment and Science, Queensland Government, Brisbane.



E2M Pty Ltd. (2021) Winchester South Project Terrestrial Ecology Assessment

Geoscience Australia. (2020). Ordered Drainage 100K - Queensland - by area of interest. Geoscience Australia.

Kavanagh R. P. (1984). Seasonal changes in habitat use by gliders and possums in southeastern New South Wales. *Possums and Gliders* (Eds A. P. Smith and I. D. Hume.) pp. 527-542. (Surrey Beatty: Sydney.)

Melzer, A., Cristescu, R., Ellis, W., Fitzgibbon, S. and Manno, G. (2014). The habitat and diet of koalas (*Phascolarctos cinereus*) in Queensland. *Australian Mammalogy*, 2014, 36, 189-199.

Neldner, V. J., Niehus, R. E., Wilson, B. A., McDonald, W. F., Ford, A. J. and Accad, A. (2020). The Vegetation of Queensland. Descriptions of Broad Vegetation Groups. Version 4.0. Queensland Herbarium, Department of Environment and Science, Brisbane.

Queensland Herbarium. (2019a). *Regional Ecosystem Description Database (REDD) Version 11.1*. Brisbane: Queensland Herbarium, Department of Environment and Science. Available from: <https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/download>.

Queensland Herbarium (2019b). BioCondition Benchmarks for Regional Ecosystem Condition Assessment: Brigalow Belt Benchmarks. Queensland Herbarium and Department of Environment and Science, Brisbane.

Specht, R. L. (1970). Vegetation in Leeper, G. W. (ed.) *The Australian Environment* (4th edn), pp. 44-67. CSIRO and Melbourne University Press, Melbourne.

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

The State of Queensland. (2020). Q-Imagery. The State of Queensland. Available from: <https://qimagery.information.qld.gov.au/>

Threatened Species Scientific Committee (TSSC). (2001). *Commonwealth Listing Advice on Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions*. Canberra: Department of Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/sevt.html>

Threatened Species Scientific Committee (TSSC). (2009). *Commonwealth Listing Advice on Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/99-conservation-advice.pdf>

Threatened Species Scientific Committee (TSSC). (2022). Conservation Advice *Petauroides volans* greater glider. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-05072022.pdf> (accessed 5 July 2022).





Appendix A Database Search Results



Appendix A.1 Inderi Study Area Database Search Results





EPBC Act Protected Matters Report

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

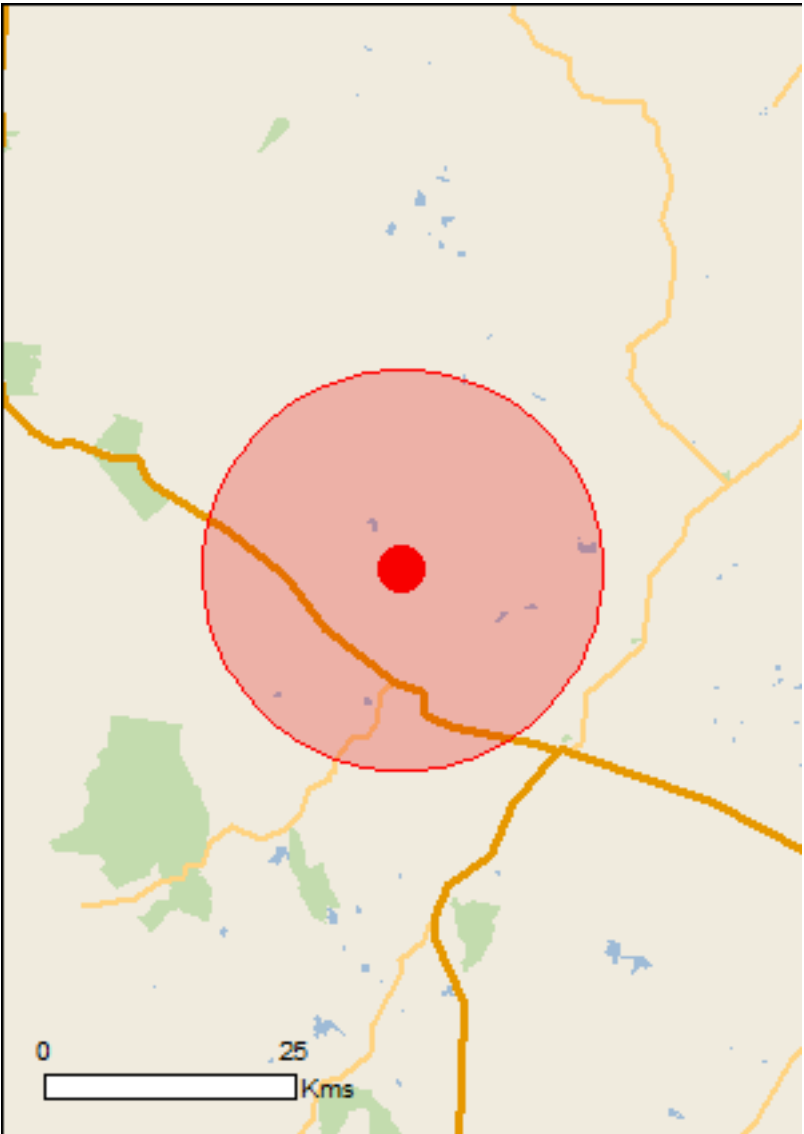
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 10/09/21 10:52:51

- [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

[Coordinates](#)

Buffer: 20.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	22
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	3
Regional Forest Agreements:	None
Invasive Species:	18
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community likely to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
area		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat likely to occur within area
Plants		
Aristida annua [17906]	Vulnerable	Species or species habitat likely to occur within area
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat known to occur within area
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat known to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat known to occur within area
Marsdenia brevifolia [64585]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within

Name	Threatened	Type of Presence
Motacilla flava Yellow Wagtail [644]		area Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
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
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		within area Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Albinia	QLD
Albinia	QLD
Albinia	QLD

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

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		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
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		

Name	Status	Type of Presence
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		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]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata 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

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

-24.3159 148.4813

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](#)
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- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

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

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

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: Rare and threatened species
Records: All
Date: Since 1980
Latitude: -24.3159
Longitude: 148.4813
Distance: 20
Email: georgia.day@e2mconsulting.com.au
Date submitted: Friday 10 Sep 2021 12:27:38
Date extracted: Friday 10 Sep 2021 12:30:02

The number of records retrieved = 14

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Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.

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

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail		V	V	1
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	1
animals	mammals	Megadermatidae	<i>Macroderma gigas</i>	ghost bat		E	V	1
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	5
animals	mammals	Pseudocheiridae	<i>Petauroides armillatus</i>	central greater glider		V	V	8
animals	reptiles	Diplodactylidae	<i>Strophurus taenicauda</i>	golden-tailed gecko		NT		1
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	1
animals	reptiles	Scincidae	<i>Egernia rugosa</i>	yakka skink		V	V	1
plants	land plants	Asteraceae	<i>Trioncinia retroflexa</i>			E		2/2
plants	land plants	Cyperaceae	<i>Cyperus clarus</i>			V		2/2
plants	land plants	Maundiaceae	<i>Maundia triglochinoides</i>			V		2
plants	land plants	Poaceae	<i>Dichanthium queenslandicum</i>			V	E	13/12
plants	land plants	Poaceae	<i>Digitaria porrecta</i>			NT		10/10
plants	land plants	Surianaceae	<i>Cadellia pentastylis</i>	ooline		V	V	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 (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

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

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

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

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

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



Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Lot: 55 Plan: DSN318

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

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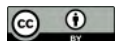


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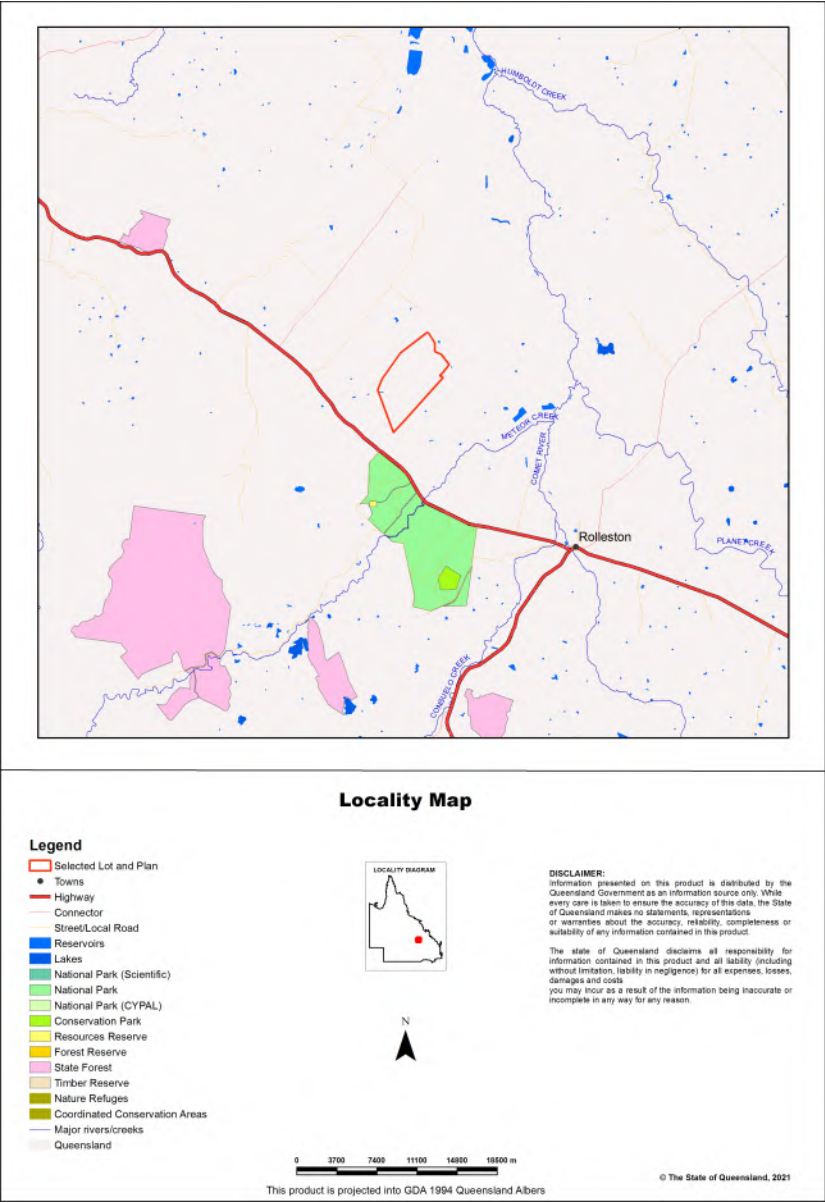
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Assessment Area Details

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 Lot: 55 Plan: DSN318

Size (ha)	3,046.05
Local Government(s)	Central Highlands Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Basalt Downs
Catchment(s)	Fitzroy



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	1.47 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	569.64 ha	18.7%
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)	2005.22 ha	65.8%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	1044.2 ha	34.3%
8e Regulated Vegetation - intersecting a watercourse **	38.2 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	10.52 ha	0.3%
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

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

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
<i>Boronia keysii</i>		V	None
<i>Calyptorhynchus lathamii</i>	Glossy black cockatoo	V	None
<i>Casuarus casuarus johnsonii</i>	Sthn population cassowary	E	None
<i>Crinia tinnula</i>	Wallum froglet	V	None
<i>Denisonia maculata</i>	Ornamental snake	V	Core
<i>Litoria freycineti</i>	Wallum rocketfrog	V	None
<i>Litoria olongburensis</i>	Wallum sedgefrog	V	None
<i>Melaleuca irbyana</i>		E	None
<i>Petaurus gracilis</i>	Mahogany Glider	E	None
<i>Petrogale persephone</i>	Proserpine rock-wallaby	E	None
<i>Phascolarctos cinereus</i>	Koala - outside SEQ*	V	None
<i>Pezoporus wallicus wallicus</i>	Eastern ground parrot	V	None
<i>Taudactylus pleione</i>	Kroombit tinkertoad	E	None
<i>Xeromys myoides</i>	Water Mouse	V	None

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

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
<i>Dichanthium queenslandicum</i>		V	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:

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

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.8.11	O-dom	rem_oc
11.8.11/11.4.9a	E-subdom	rem_end
11.3.4/11.3.3	O-dom	rem_oc
11.8.5/11.8.11	O-subdom	rem_oc
11.3.3a	O-dom	rem_oc
11.4.2	O-dom	rem_oc
11.8.11/11.8.5	O-dom	rem_oc

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

Not applicable

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

Not applicable

8d. Regulated Vegetation - Essential habitat

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
B	8549	None

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

MSES - Offsets

9a. Legally secured offset areas - offset register areas

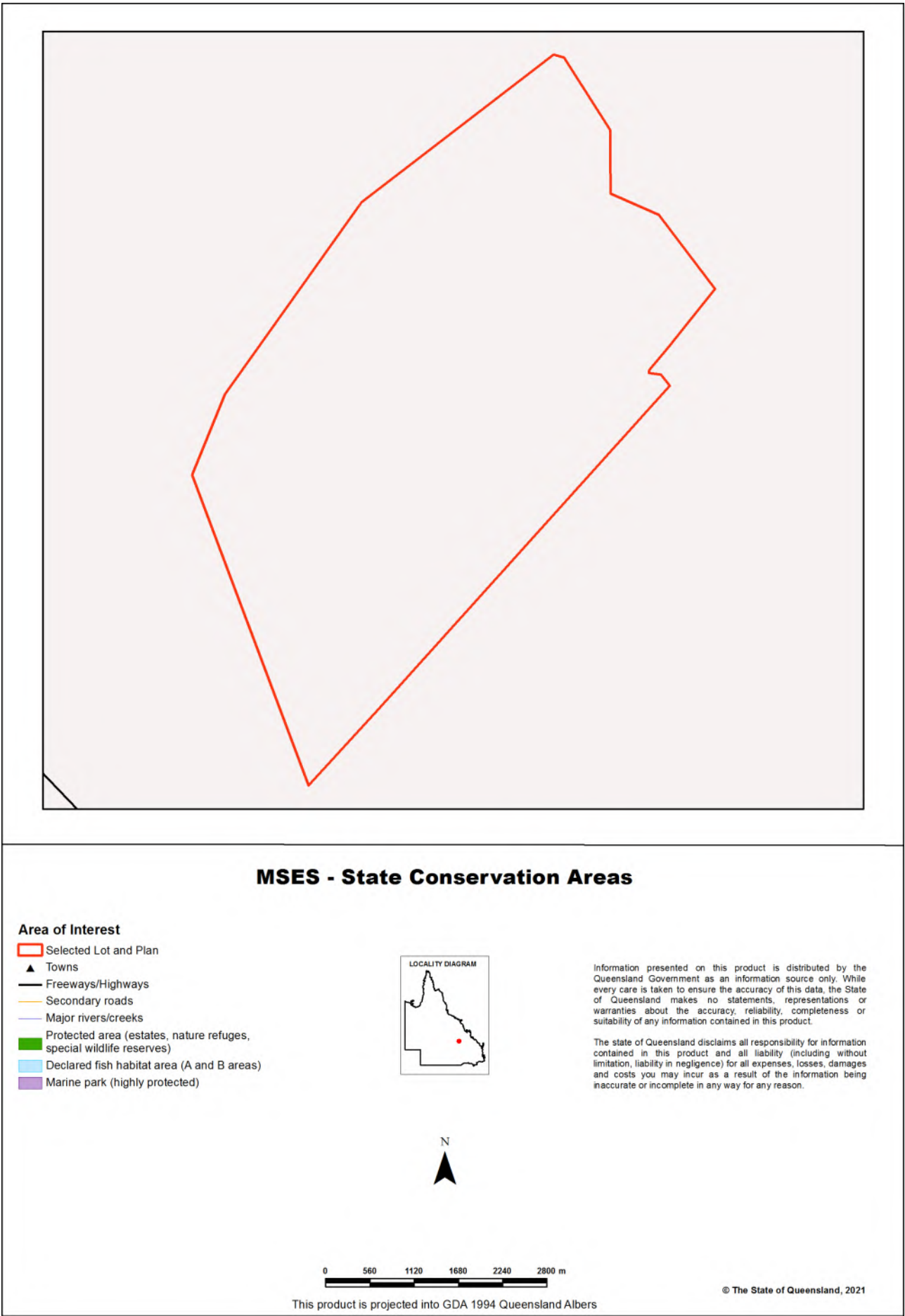
(no results)

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

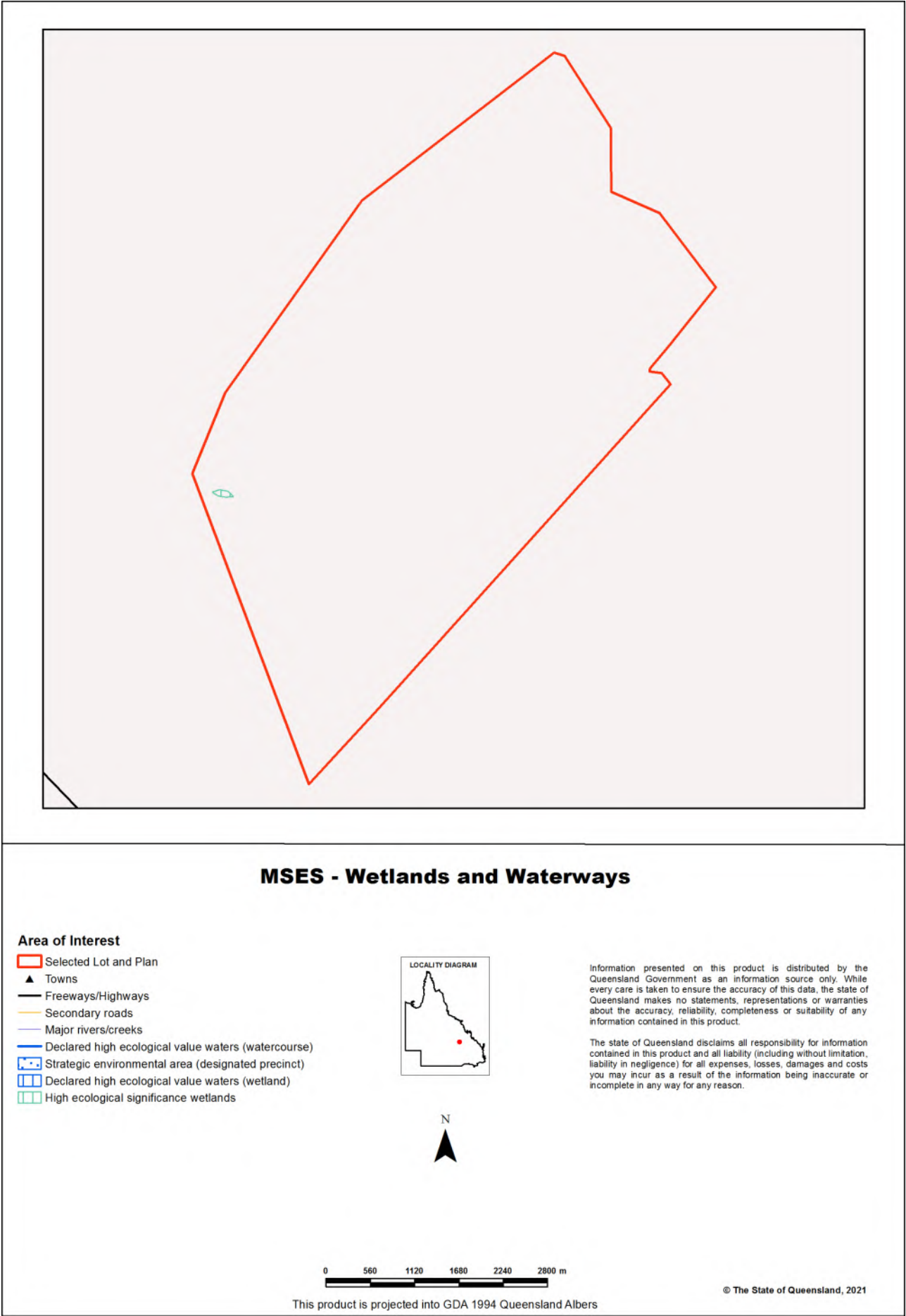
(no results)

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

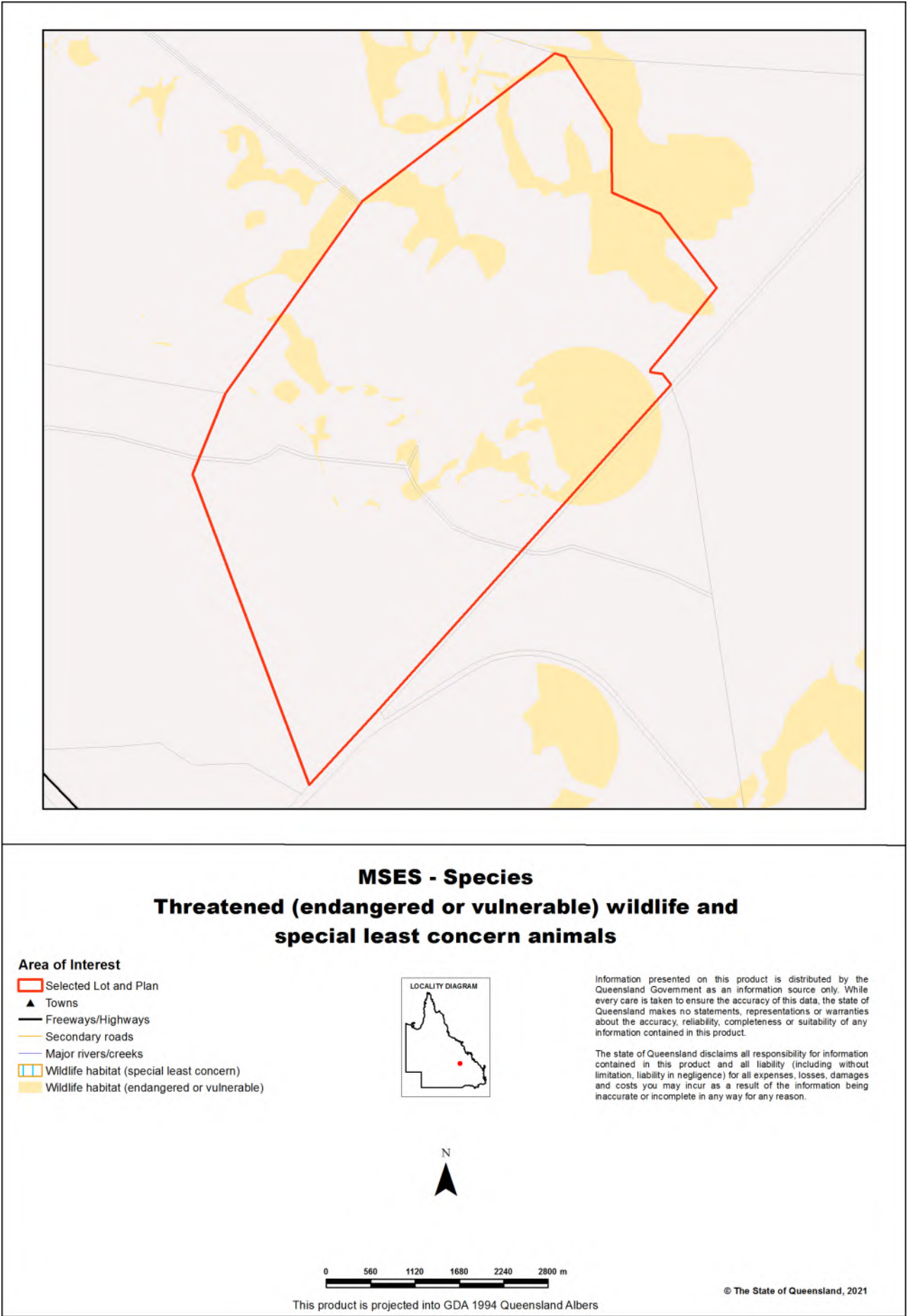
Map 1 - MSES - State Conservation Areas



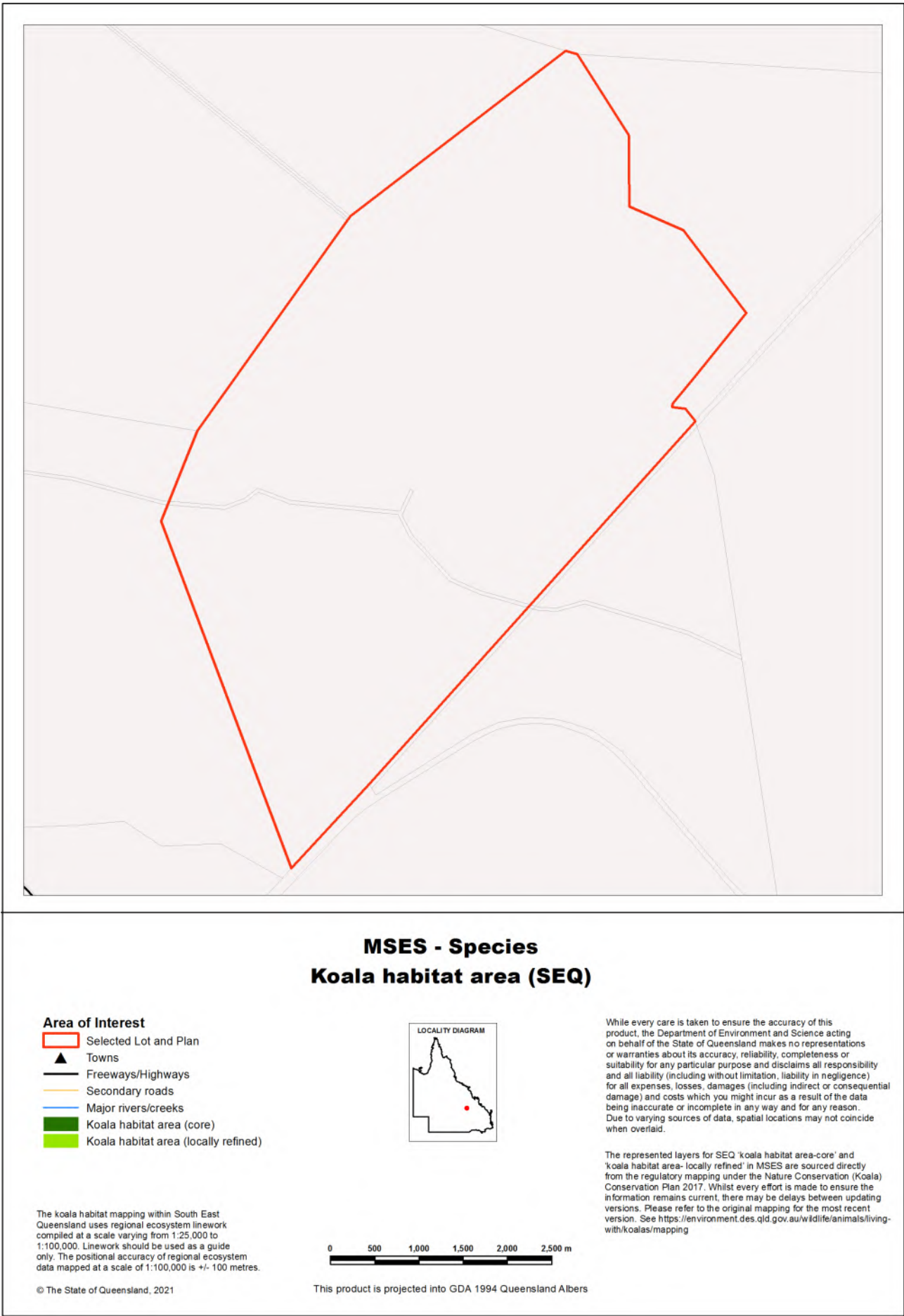
Map 2 - MSES - Wetlands and Waterways



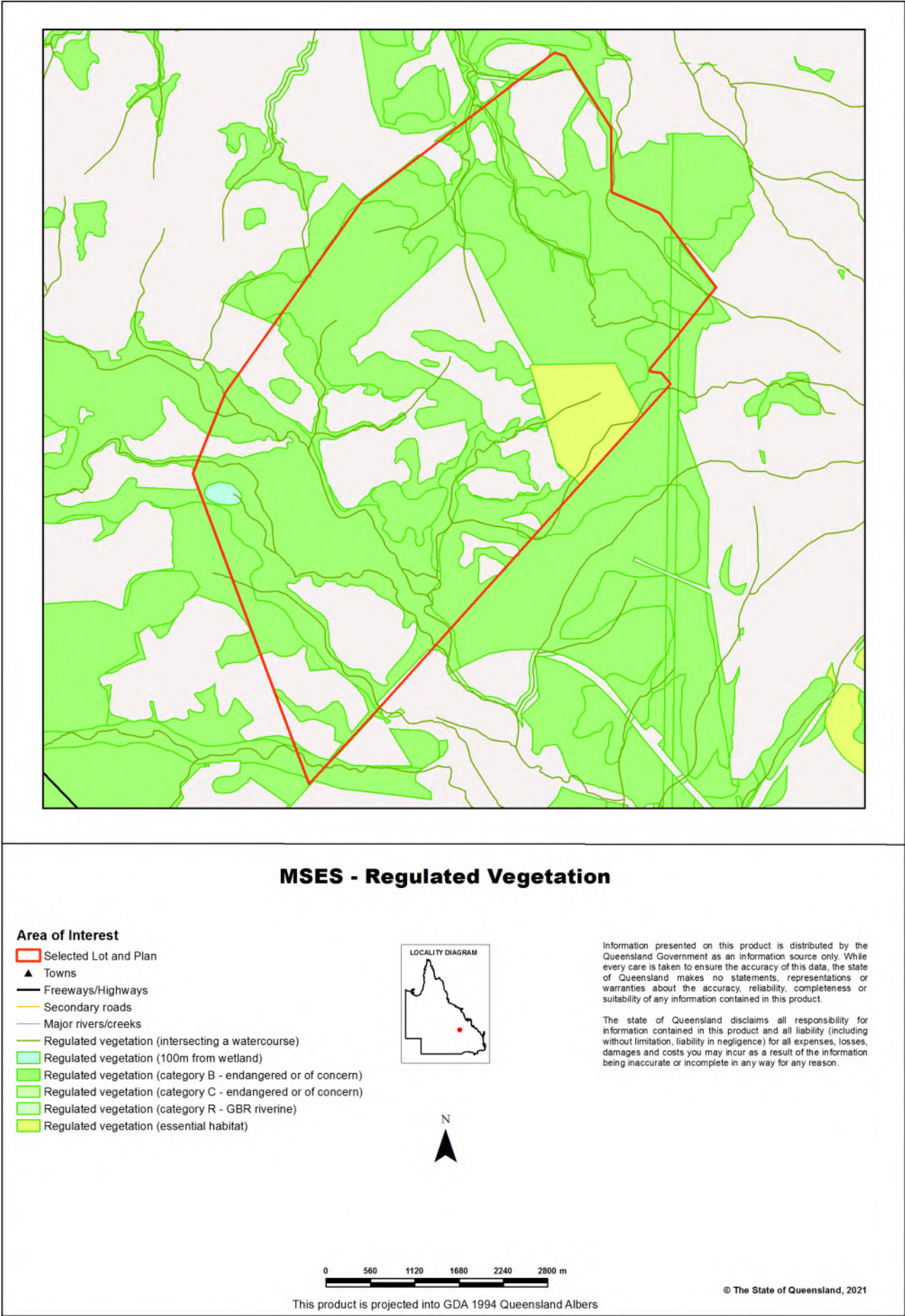
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



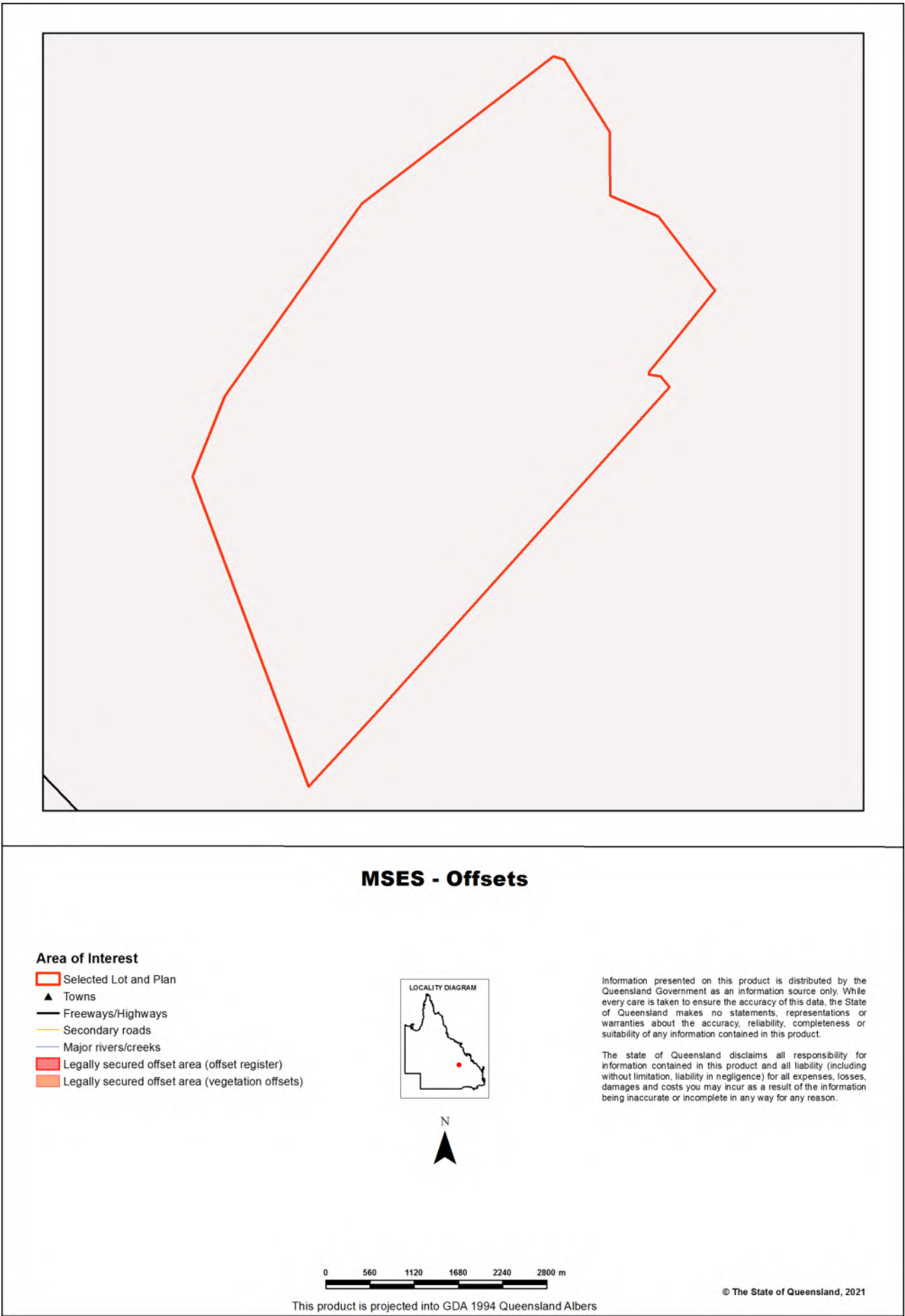
Map 3b - MSES - Species - Koala habitat area (SEQ)



Map 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	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - 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	- <i>Environmental Protection Act 1994</i>
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>



Vegetation management report

For Lot: 55 Plan: DSN318

10/09/2021

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Recent changes

Updated mapping

Updated vegetation mapping was released on 8 September 2021 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

The Department of Environment and Science have also updated their protected plant and koala protection mapping to align with the Queensland Herbarium scientific updates.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 55 Plan: DSN318, are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
55	DSN318	Freehold	30,335,240
B	SP107596	Easement	193,100
C	SP107596	Easement	220,700

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 55 Plan: DSN318, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Central Highlands Regional

Bioregion(s)	Subregion(s)
Brigalow Belt	Basalt Downs

Catchment(s)
Fitzroy

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

<https://www.qld.gov.au/environment/land/vegetation/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

<https://www.qld.gov.au/environment/land/vegetation/codes/>

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Resources before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at

<https://apps.dnrm.qld.gov.au/vegetation/>

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.

<https://www.qld.gov.au/environment/land/vegetation/area-plans/>

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

<https://www.qld.gov.au/environment/land/management/vegetation/development>

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit <https://www.dnrme.qld.gov.au/?contact=vegetation> to submit an online enquiry.

3. Vegetation management framework for Lot: 55 Plan: DSN318

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 3045.99ha

Vegetation category	Area (ha)
Category A	137.3
Category B	2018.0
Category X	890.8

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Resources to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department of Resources to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property:

Reference number

2017/003924

2015/002362

2011/007674

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

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

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.3	Of concern	A	0.51	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.3	Of concern	B	281.80	Eucalyptus coolabah woodland on alluvial plains	Sparse
11.3.4	Of concern	B	287.23	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.4.2	Of concern	A	28.38	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Sparse
11.4.2	Of concern	B	81.96	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Sparse
11.4.9	Endangered	B	0.03	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.8.11	Of concern	A	65.05	Dichanthium sericeum grassland on Cainozoic igneous rocks	Grassland Sch 4
11.8.11	Of concern	B	988.13	Dichanthium sericeum grassland on Cainozoic igneous rocks	Grassland Sch 4
11.8.5	Least concern	A	43.33	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	Very sparse
11.8.5	Least concern	B	378.80	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	Very sparse
non-rem	None	X	890.76	None	None

Please note:

1. All area and area derived figures included in this table 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.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

Vegetation management wetlands are present on this property and are shown on the vegetation management supporting map in section 4.2 of this report.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.
11064	Dichanthium queenslandicum	None	V	tussock grassland occasional with scattered trees of Corymbia spp. or Eucalyptus spp. or Acacia spp.; woodland of Corymbia erythrophloia, or Eucalyptus orgadophila, or Eucalyptus melanophloia with grassy understorey.	100 to 900 m	black cracking clay	flat terrain, gentle undulating plain

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1, 10.9.6, 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6
11064	9.8.13, 11.3.4, 11.3.21, 11.4.4, 11.8.5, 11.8.11, 11.9.3

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

Class A (with urban areas masked as per SPP): 2112.82ha

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 55 Plan: DSN318.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:

<https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new [property maps of assessable vegetation \(PMAV\)](#).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

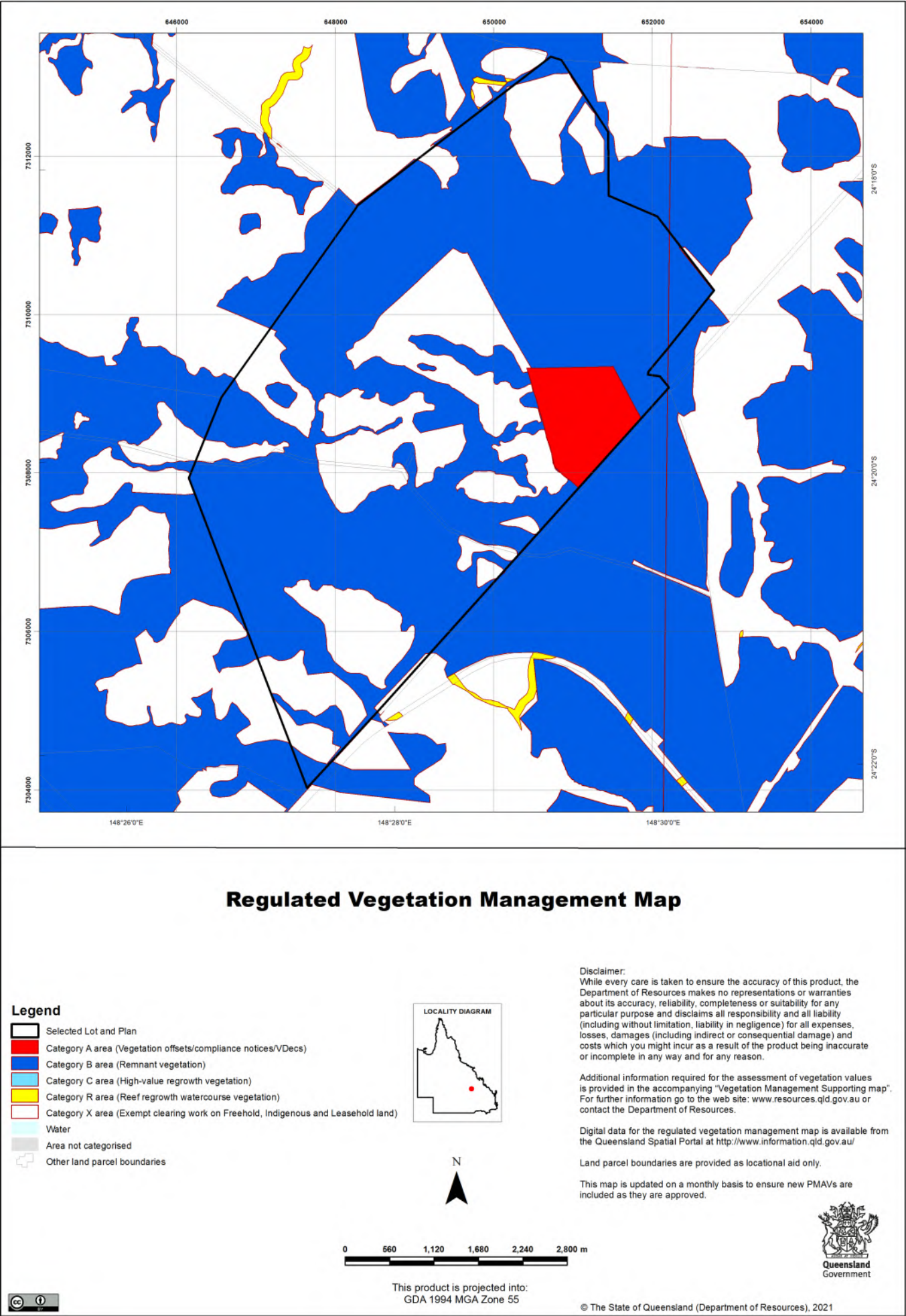
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

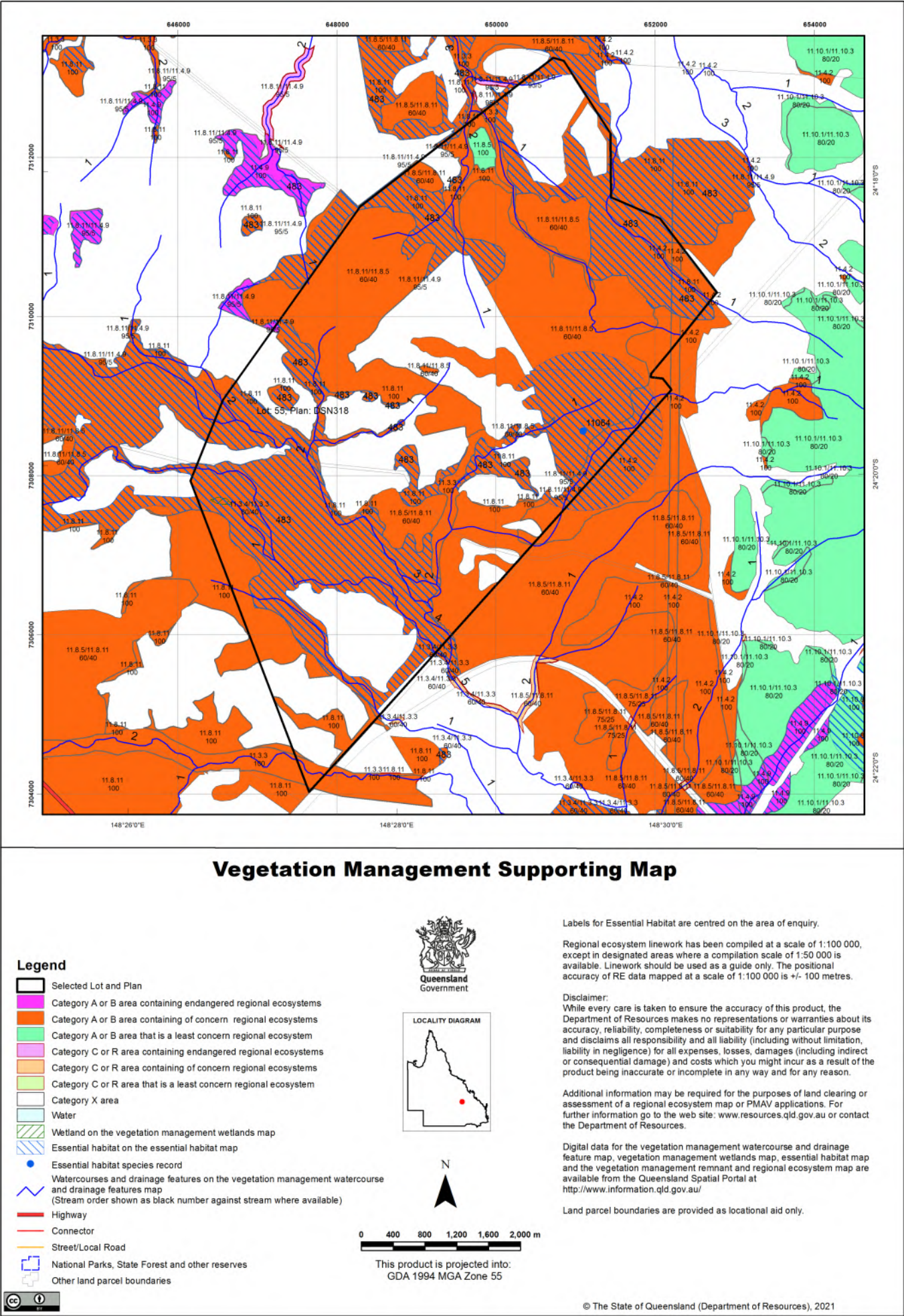
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

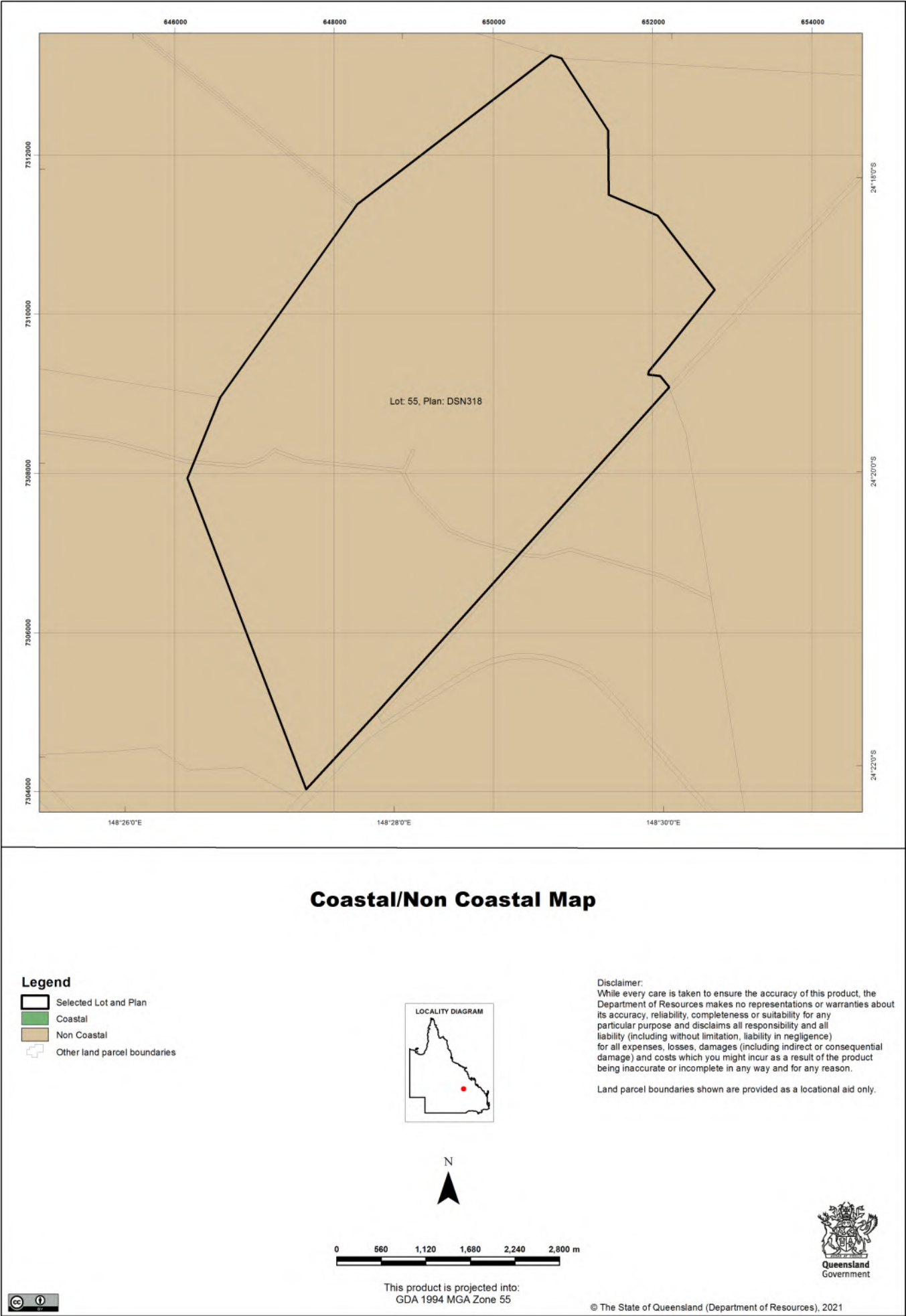
4.1 Regulated vegetation management map



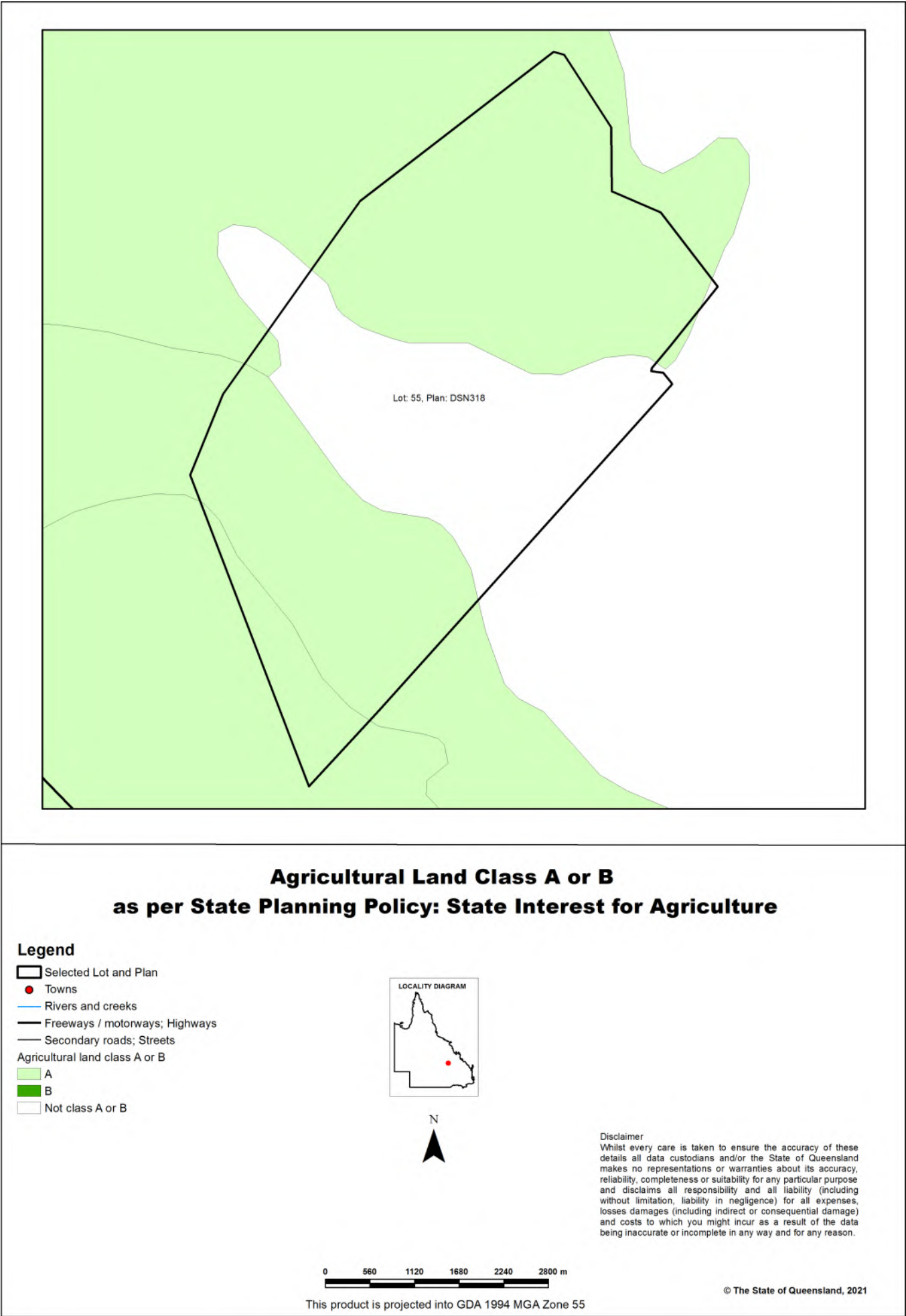
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](#) (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the [Flora survey guidelines](#). The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An [exempt clearing notification form](#) must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the [clearing permit application form](#).

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:

Phone 1300 130 372 (and select option four)

Email palm@des.qld.gov.au

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

5.5 Protected plants flora survey trigger map

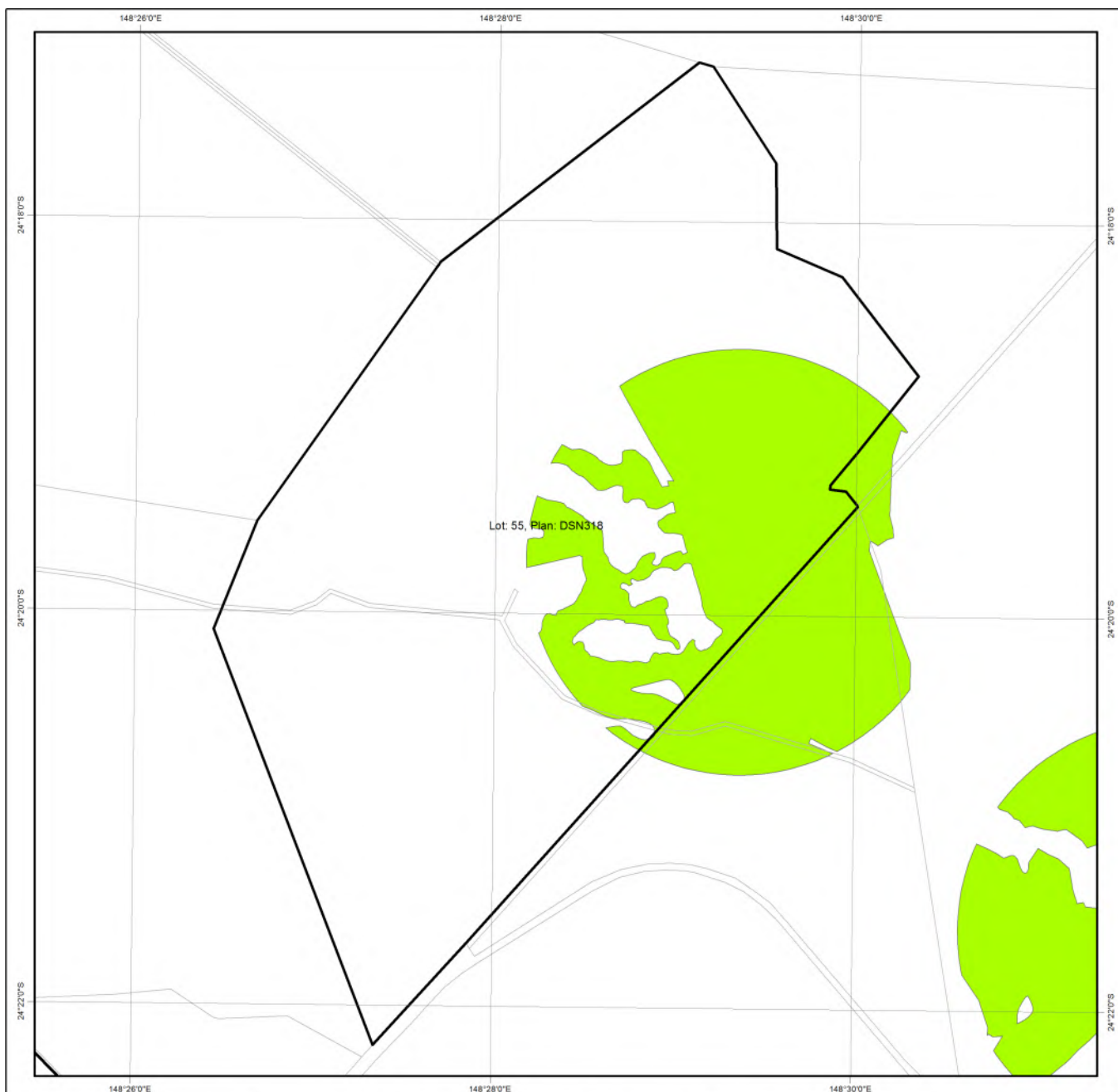
This map included may also be requested individually at: <https://apps.des.qld.gov.au/map-request/flora-survey-trigger/>.

Updates to the data informing the flora survey trigger map

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

Species information

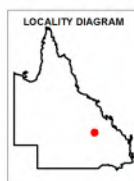
Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the [Queensland Spatial Catalogue](#), the Department of Environment and Science does not provide species information on request.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



Protected Plants Flora Survey Trigger Map

Legend

-  Selected Lot and Plan
-  High risk area
-  Other land parcel boundaries
-  Freeways / motorways / highways
-  Secondary roads / streets



0 370 740 1,110 1,480 1,850 m

This product is projected into:
GDA 1994 MGA Zone 55

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

Land parcel boundaries are provided as locational aid only.

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

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

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

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document [Spatial modelling in South East Queensland](#).

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document [Guideline - Requests to make, amend or revoke a koala habitat area determination](#).

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps>. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

- 1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
- 2) Does not include destroying standing vegetation by stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the [Planning Regulation 2017](#). More information on exempted development can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
 - the local government planning scheme makes the development assessable;
 - the premises includes an area that is both a koala priority area and a koala habitat area; and
 - the development does not involve interfering with koala habitat (defined above); and
- development in identified koala broad-hectare areas.

The [Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks](#) outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the [Nature Conservation \(Koala\) Conservation Plan 2017](#) prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

For further information on the koala protection framework:

Phone 13 QGOV (13 74 68)

Email koala.assessment@des.qld.gov.au

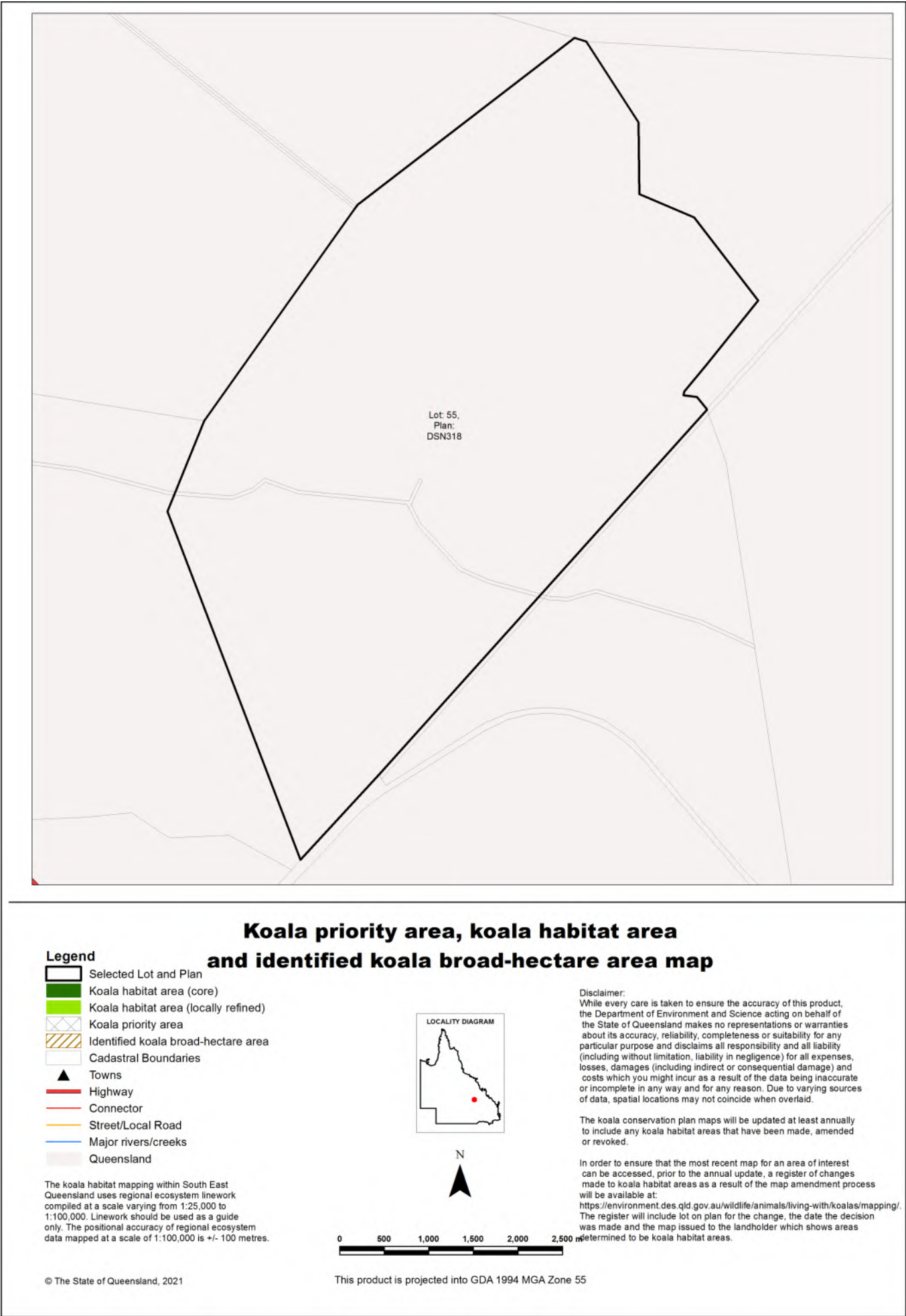
Visit <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>

7. Koala protection framework details for Lot: 55 Plan: DSN318

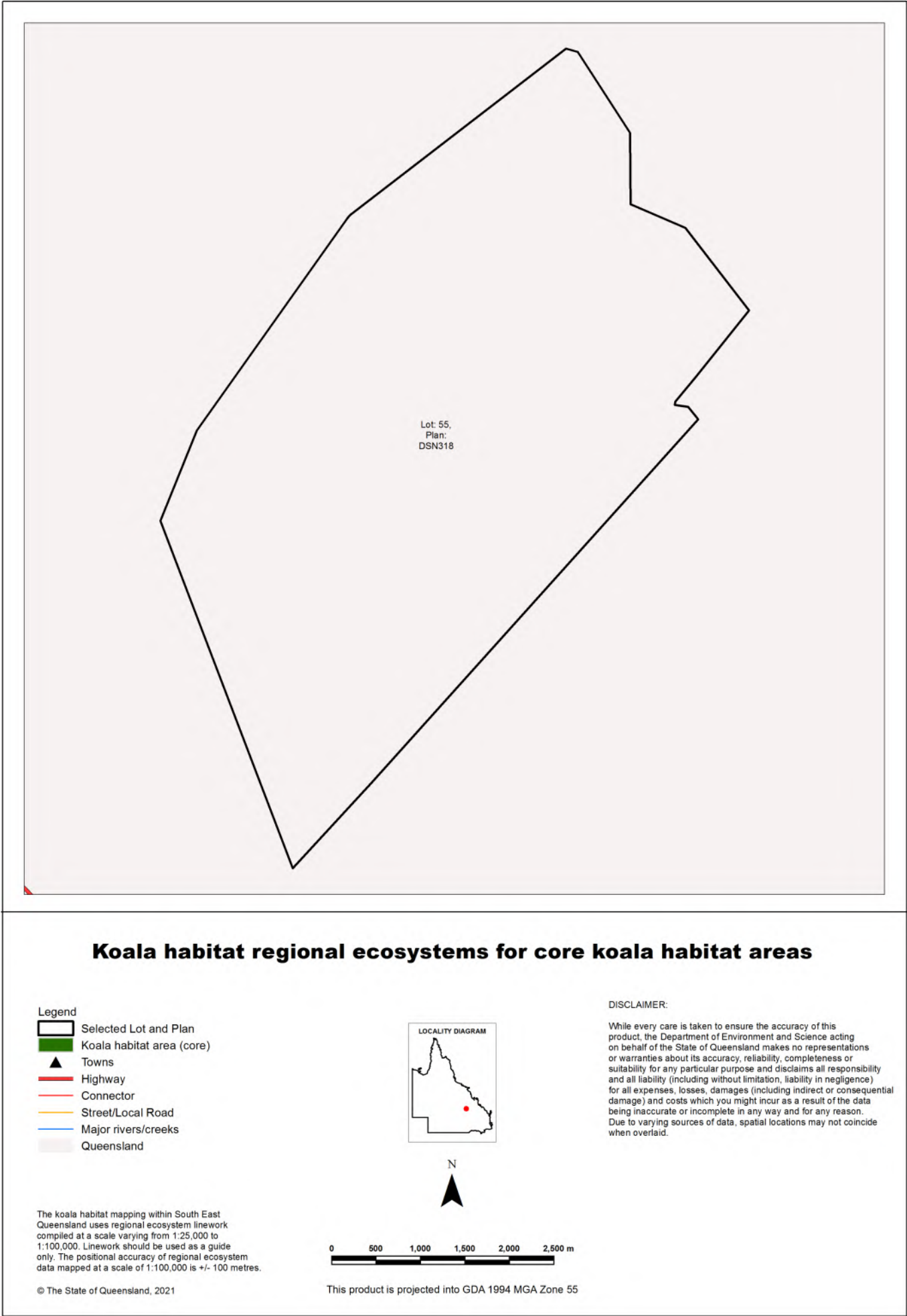
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Regional Development, Manufacturing and Water (Queensland Government) Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Protected plants and protected areas	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.des.qld.gov.au
• Koala mapping and regulations	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Agriculture, Water and the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office
• Harvesting timber in the Wet Tropics of Qld World Heritage area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au

Appendix A.2 Wynette North Study Area Database Search Results





EPBC Act Protected Matters Report

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

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

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

Report created: 10/09/21 10:52:06

[Summary](#)

[Details](#)

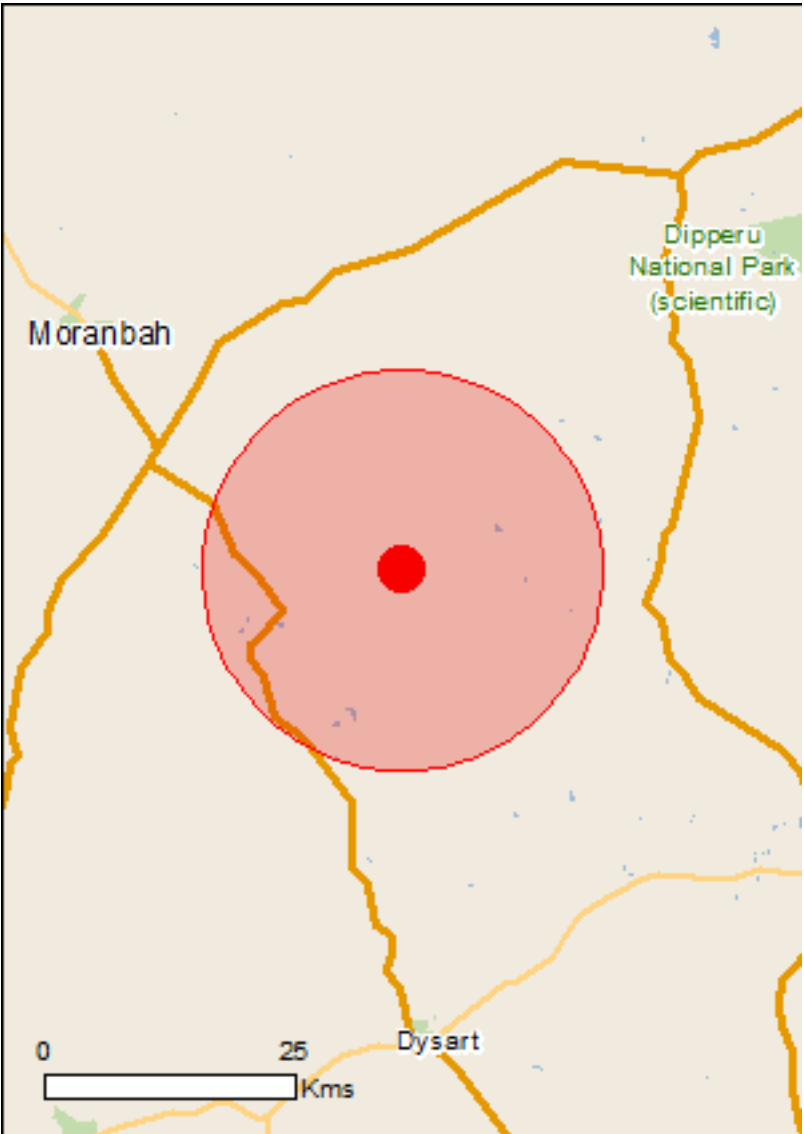
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

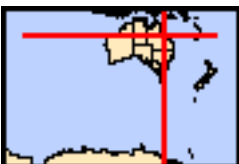
[Acknowledgements](#)



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

[Buffer: 20.0Km](#)



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	22
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species

Name	Status	Type of Presence
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	habitat likely to occur within area Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Plants		
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species

Name	Threatened	Type of Presence
habitat may occur within area		
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]	Critically Endangered	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]		Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia 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 EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]	Critically Endangered	Species or species habitat may 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
Ardea ibis 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]		Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]	Endangered*	Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Invasive Species	[Resource Information]
------------------	--

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

Name	Status	Type of Presence
Birds		
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata 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

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

-22.2 148.31547

Acknowledgements

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

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

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

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

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: Rare and threatened species
Records: All
Date: Since 1980
Latitude: -22.2000
Longitude: 148.3155
Distance: 20
Email: georgia.day@e2mconsulting.com.au
Date submitted: Friday 10 Sep 2021 11:21:08
Date extracted: Friday 10 Sep 2021 11:30:02

The number of records retrieved = 9

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

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	19
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	87
animals	mammals	Pseudocheiridae	<i>Petauroides armillatus</i>	central greater glider		V	V	60
animals	mammals	Vespertilionidae	<i>Chalinolobus dwyeri</i>	large-eared pied bat		V	V	1
animals	reptiles	Elapidae	<i>Acanthophis antarcticus</i>	common death adder		V		1
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	28
plants	land plants	Euphorbiaceae	<i>Bertya pedicellata</i>			NT		1/1
plants	land plants	Solanaceae	<i>Solanum adenophorum</i>			E		1/1
plants	land plants	Solanaceae	<i>Solanum elaeagnifolium</i>			E		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 (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

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

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

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

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

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



Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Lot: 4 Plan: CNS15

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.

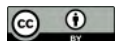


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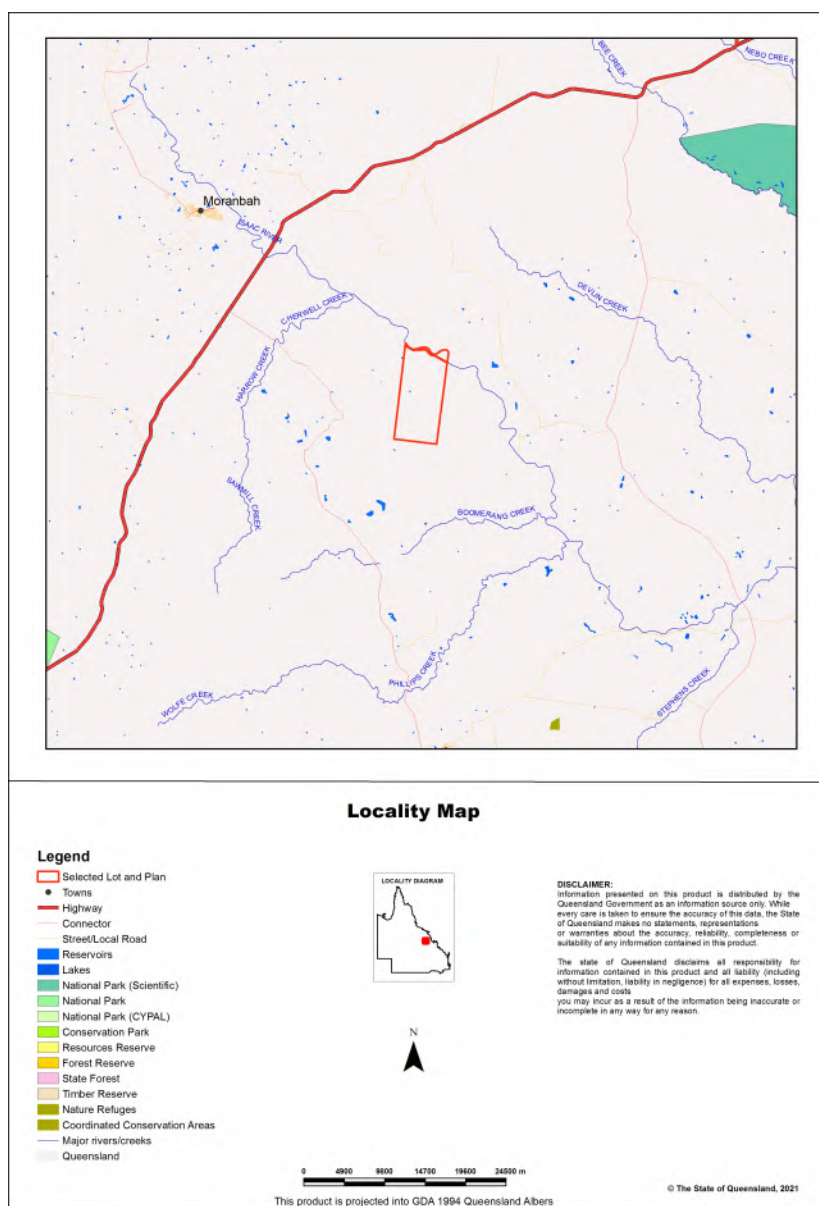
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Assessment Area Details

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 Lot: 4 Plan: CNS15

Size (ha)	5,865.06
Local Government(s)	Isaac Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Northern Bowen Basin, Isaac - Comet Downs
Catchment(s)	Fitzroy



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	17.09 ha	0.3%
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	770.52 ha	13.1%
7b Special least concern animals	72.92 ha	1.2%
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)	257.63 ha	4.4%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	0.0 ha	0.0 %
8d Regulated Vegetation - Essential habitat	796.3 ha	13.6%
8e Regulated Vegetation - intersecting a watercourse **	12.8 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	142.2 ha	2.4%
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

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Queensland Wetland Environmental Values are present.

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

Values are present

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

*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
<i>Phascolarctos cinereus</i>	koala	V	V	
<i>Rostratula australis</i>	Australian painted snipe	E	E	
<i>Petauroides volans</i>	greater glider	V	V	

Special least concern animal species records

Scientific name	Common name	Migratory status
<i>Tachyglossus aculeatus</i>	short-beaked echidna	

*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:

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

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.1/11.4.9	E-dom	rem_end
11.4.9	E-dom	rem_end
11.3.2/11.3.7	O-dom	rem_oc
11.3.1	E-dom	rem_end
11.3.2/11.3.7/11.3.1	E-subdom	rem_end
11.3.4	O-dom	rem_oc
11.3.2	O-dom	rem_oc
11.5.3/11.4.9	E-subdom	rem_end
11.5.17	E-dom	rem_end

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

Not applicable

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

Not applicable

8d. Regulated Vegetation - Essential habitat

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
B	8553	None

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

MSES - Offsets

9a. Legally secured offset areas - offset register areas

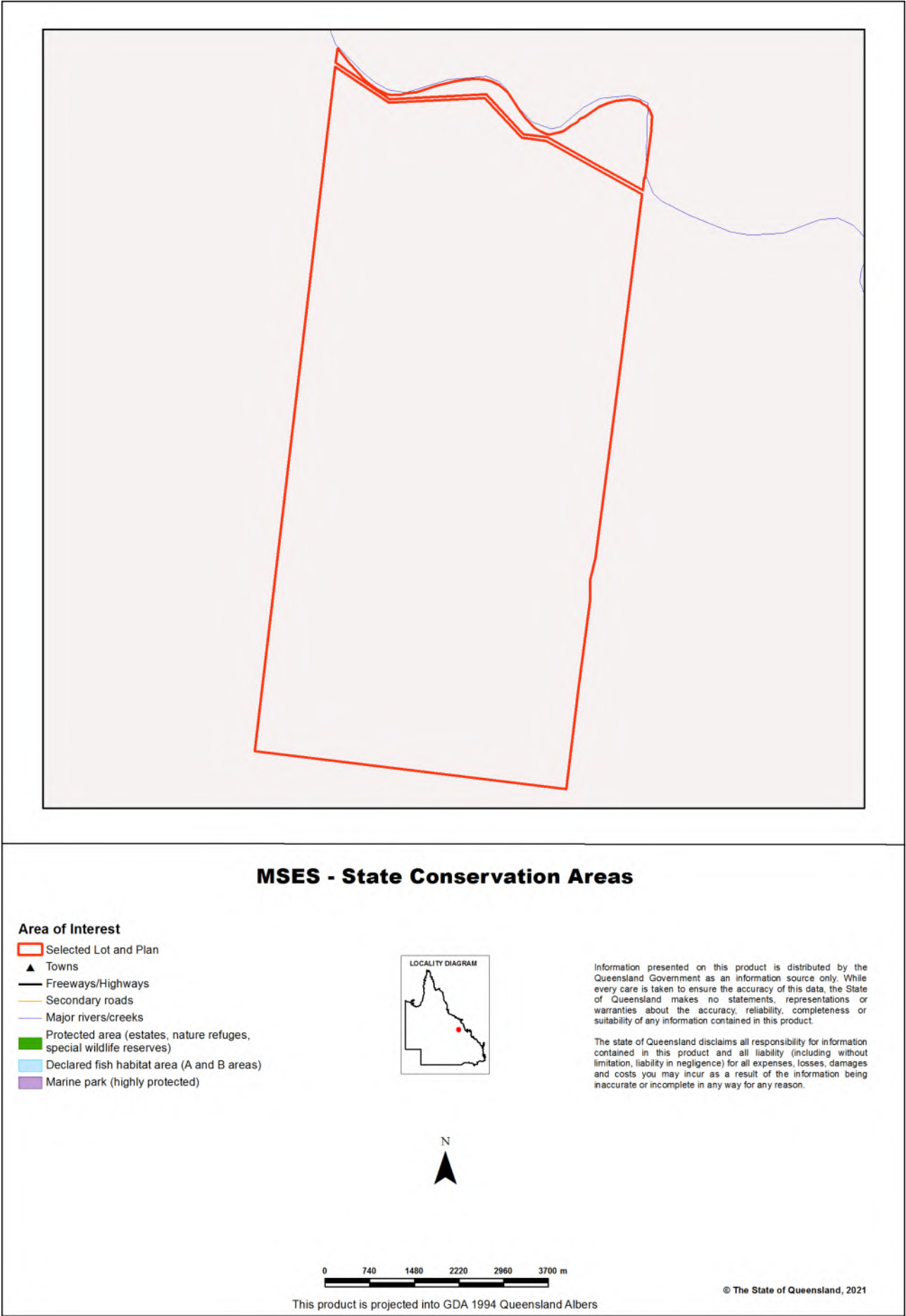
(no results)

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

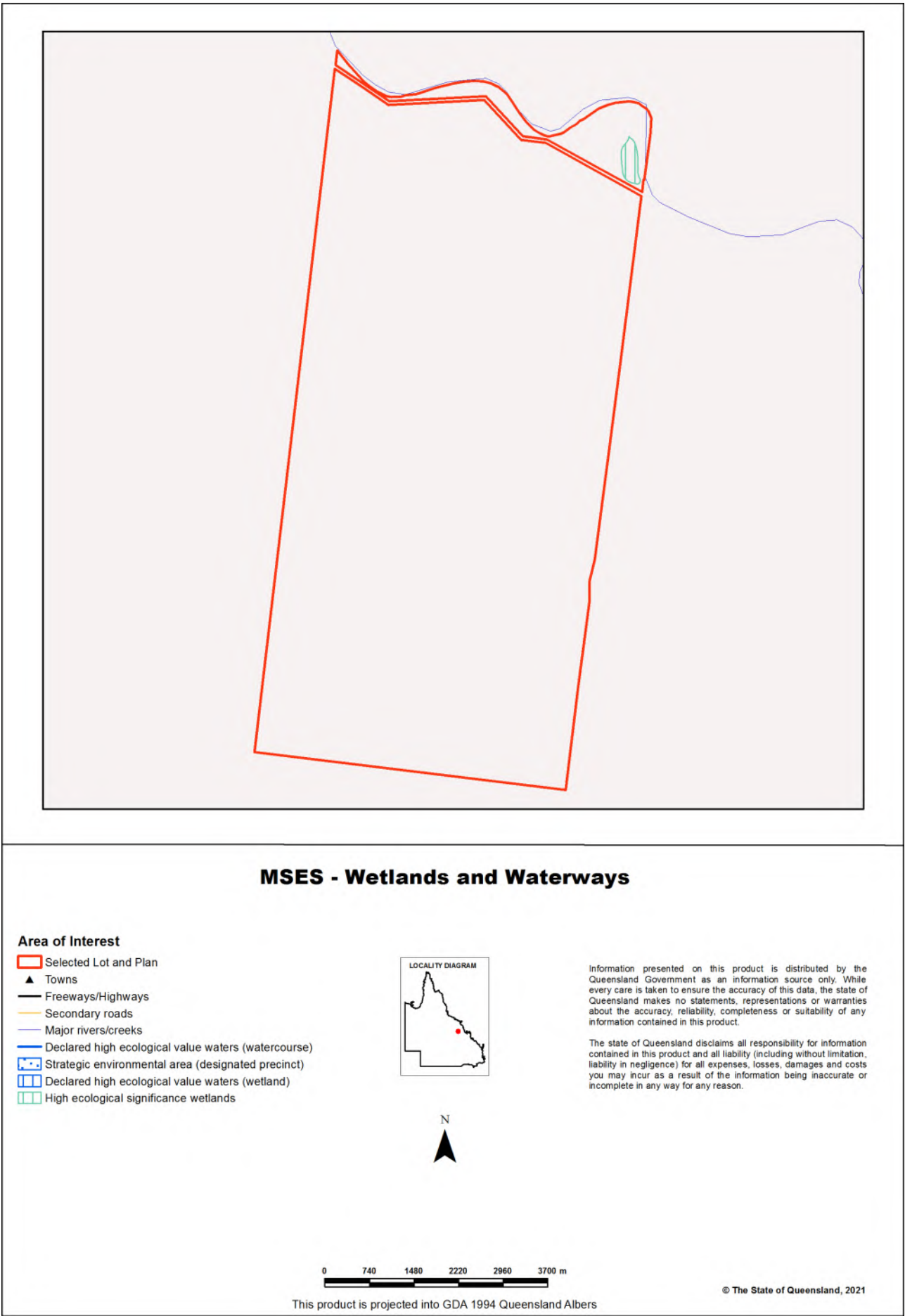
(no results)

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

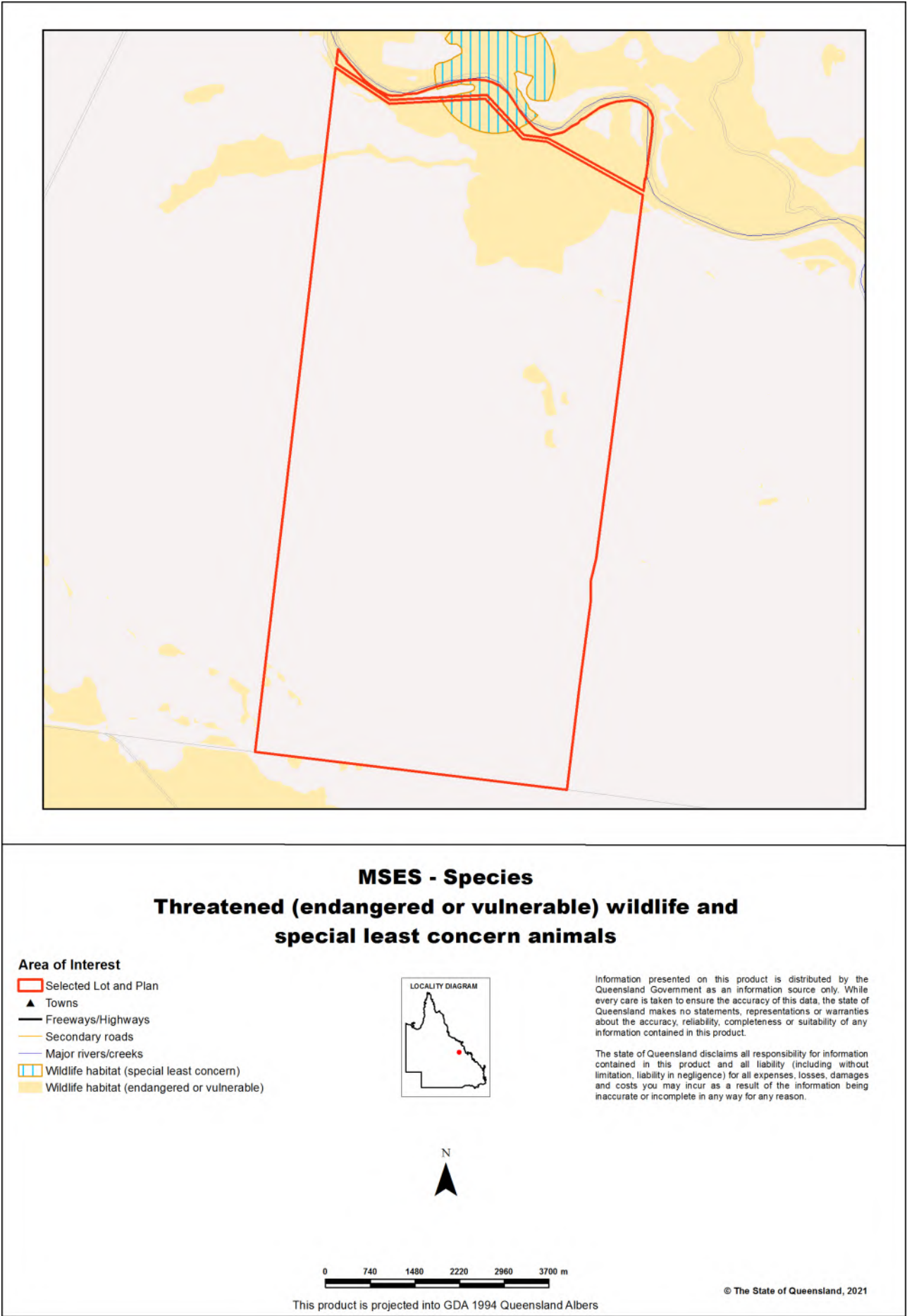
Map 1 - MSES - State Conservation Areas



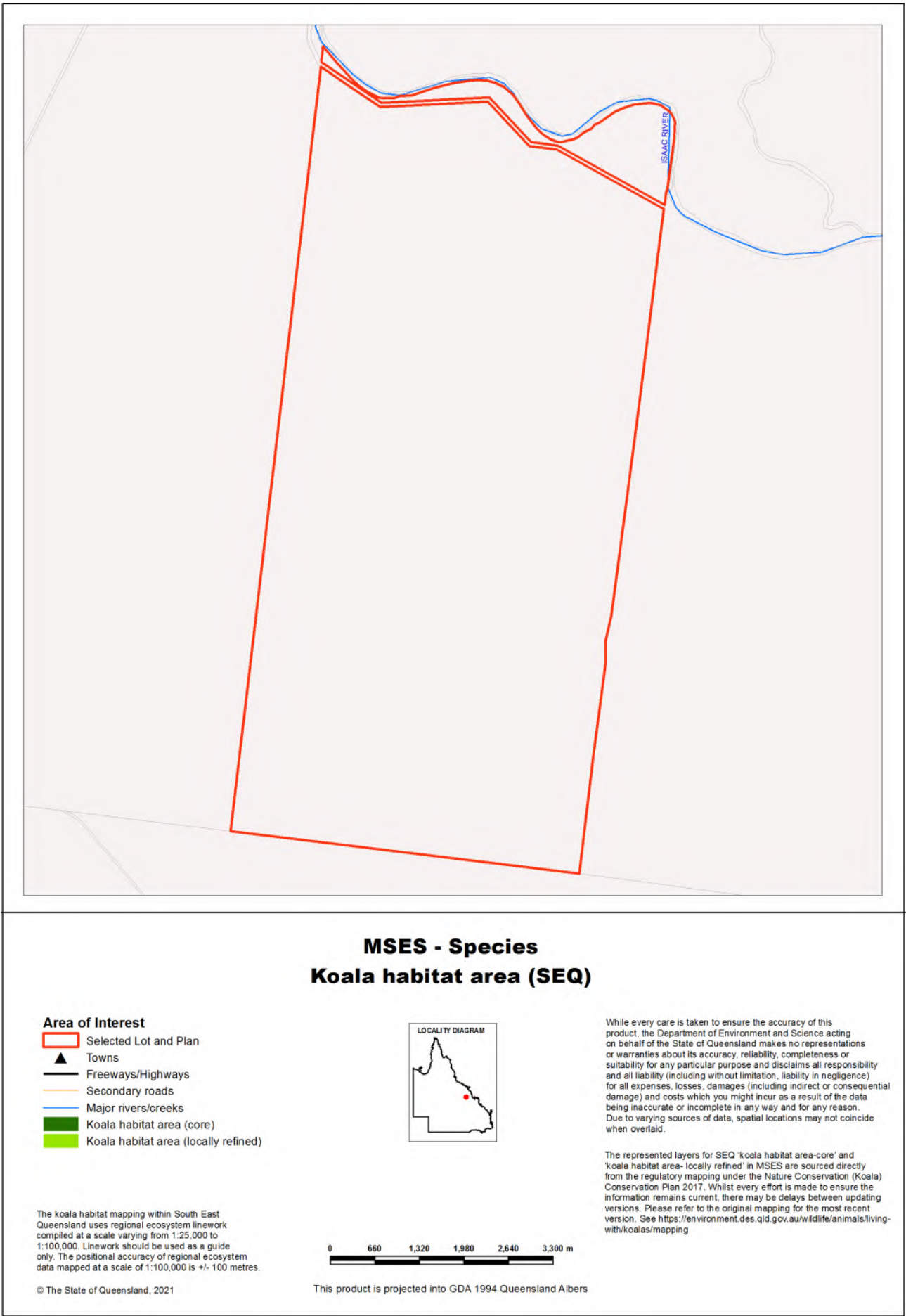
Map 2 - MSES - Wetlands and Waterways



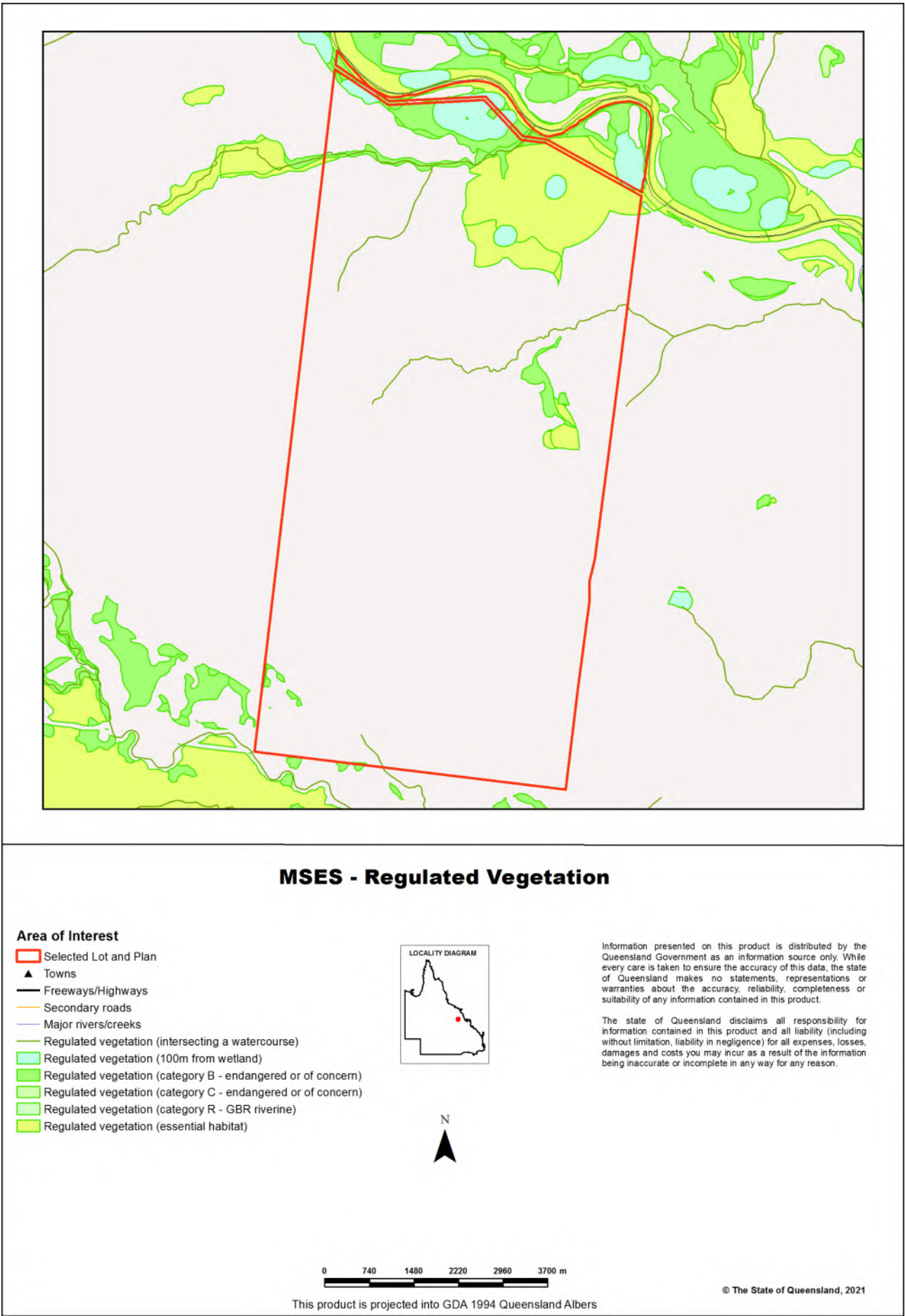
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



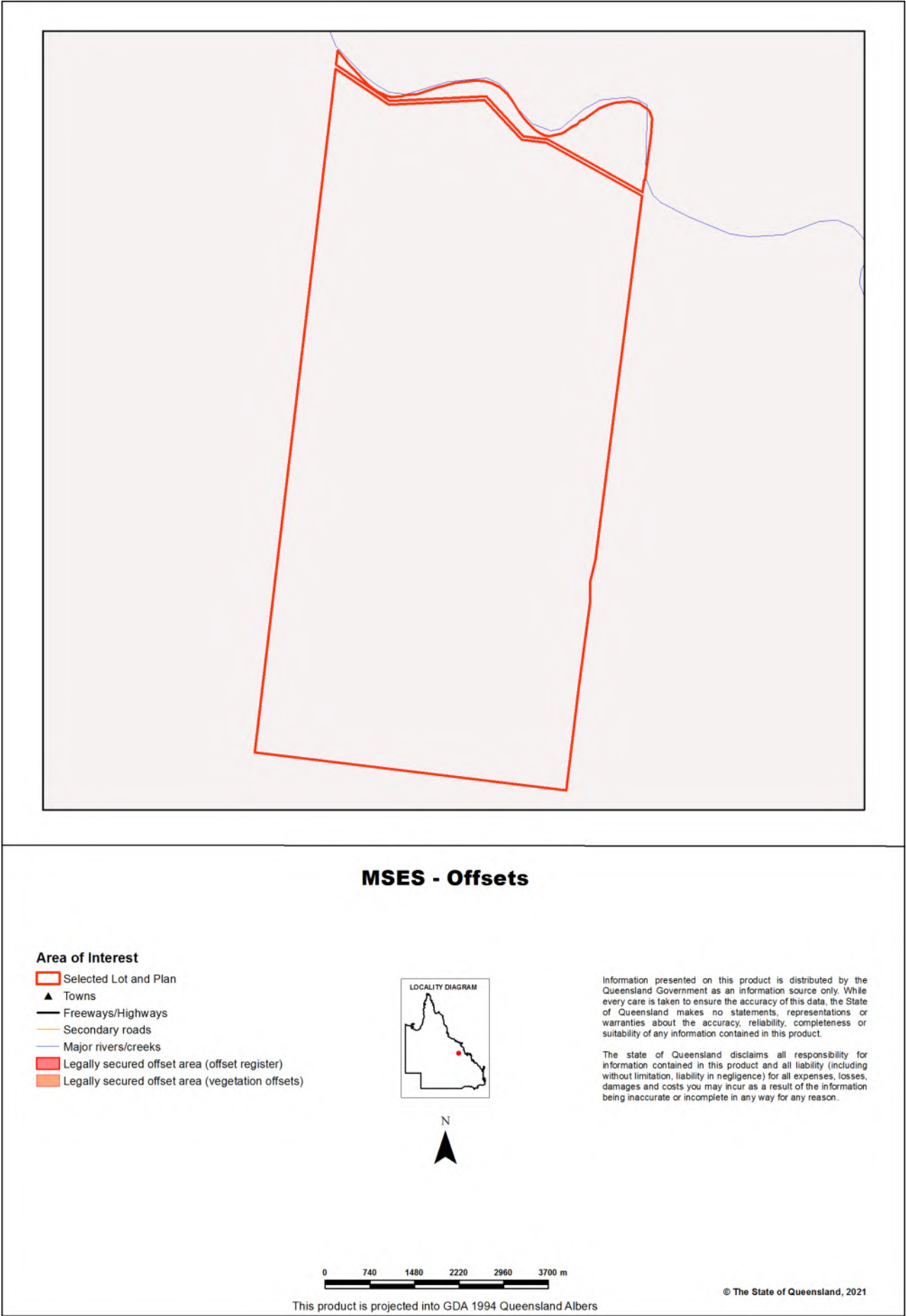
Map 3b - MSES - Species - Koala habitat area (SEQ)



Map 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	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - 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	- <i>Environmental Protection Act 1994</i>
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>



Vegetation management report

For Lot: 4 Plan: CNS15

10/09/2021

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Recent changes

Updated mapping

Updated vegetation mapping was released on 8 September 2021 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

The Department of Environment and Science have also updated their protected plant and koala protection mapping to align with the Queensland Herbarium scientific updates.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 4 Plan: CNS15, are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
4	CNS15	Freehold	58,529,680

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 4 Plan: CNS15, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Isaac Regional

Bioregion(s)	Subregion(s)
Brigalow Belt	Northern Bowen Basin
Brigalow Belt	Isaac - Comet Downs

Catchment(s)
Fitzroy

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

<https://www.qld.gov.au/environment/land/vegetation/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

<https://www.qld.gov.au/environment/land/vegetation/codes/>

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Resources before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at

<https://apps.dnrm.qld.gov.au/vegetation/>

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.

<https://www.qld.gov.au/environment/land/vegetation/area-plans/>

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

<https://www.qld.gov.au/environment/land/management/vegetation/development>

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit <https://www.dnrme.qld.gov.au/?contact=vegetation> to submit an online enquiry.

3. Vegetation management framework for Lot: 4 Plan: CNS15

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 5865.06ha

Vegetation category	Area (ha)
Category B	1170.1
Category X	4695.0

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Resources to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department of Resources to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property:

Reference number

2017/006281

2015/003474

2009/002508

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

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

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.1	Endangered	B	39.51	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.2	Of concern	B	116.05	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.25	Least concern	B	37.64	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.27	Least concern	B	41.64	Freshwater wetlands	Other
11.3.4	Of concern	B	30.53	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.3.7	Least concern	B	24.59	Corymbia spp. open woodland on alluvial plains	Very sparse
11.4.9	Endangered	B	42.44	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.5.15	Least concern	B	1.97	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Dense
11.5.17	Endangered	B	4.51	Eucalyptus tereticornis woodland in depressions on Cainozoic sand plains and remnant surfaces	Sparse
11.5.3	Least concern	B	829.74	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.9.2	Least concern	B	0.73	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Sparse
11.9.3	Least concern	B	0.73	Dichanthium spp., Astrebla spp. grassland on fine-grained sedimentary rocks	Grassland Sch 4
non-rem	None	X	4,694.98	None	None

Please note:

1. All area and area derived figures included in this table 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.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

Vegetation management wetlands are present on this property and are shown on the vegetation management supporting map in section 4.2 of this report.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.
848	Petauroides volans	greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
860	Phascolarctos cinereus	koala	V	Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon or Melaleuca trees having a trunk of a diameter of more than 10cm at 1.3m above the ground. Tree species used for food and habitat varies across the state and can include: Corymbia citriodora, Corymbia henryi, Corymbia intermedia, Eucalyptus acmenoides, Eucalyptus bancroftii, Eucalyptus biturbinata, Eucalyptus blakelyi, Eucalyptus brownii, Eucalyptus camaldulensis, Eucalyptus carnea, Eucalyptus chloroclada, Eucalyptus coolabah, Eucalyptus crebra, Eucalyptus dealbata, Eucalyptus drepanophylla, Eucalyptus dunnii, Eucalyptus eugenioides, Eucalyptus exserta, Eucalyptus fibrosa, Eucalyptus grandis, Eucalyptus helidonica, Eucalyptus latisinensis, Eucalyptus longirostrata, Eucalyptus major, Eucalyptus melanophloia, Eucalyptus melliodora, Eucalyptus microcarpa, Eucalyptus microcorys, Eucalyptus microtheca, Eucalyptus moluccana, Eucalyptus montivaga, Eucalyptus orgadophila, Eucalyptus papuana, Eucalyptus pilularis, Eucalyptus platyphylla, Eucalyptus populnea, Eucalyptus portuensis, Eucalyptus propinqua, Eucalyptus racemosa, Eucalyptus resinifera, Eucalyptus robusta, Eucalyptus saligna, Eucalyptus seeana, Eucalyptus siderophloia, Eucalyptus sideroxylon, Eucalyptus tereticornis, Eucalyptus thozetiana, Eucalyptus tindaliae, Eucalyptus umbra, Lophostemon confertus, Melaleuca leucadendra, Melaleuca quinquenervia.	Sea level to 1000m.	None	Riparian areas, plains and hill/escarpment slopes.
1883	Rostratula australis	Australian painted snipe	E	Shallow ephemeral and permanent swamps, water meadows and damp lake margins with rushes, long grass and herbage (e.g. lignum, chenopods) in good condition, as well as areas of muddy ground; also uses saltmarsh, samphire flats and waterlogged grasslands with trees present (e.g. Eucalyptus camaldulensis, E. brownii). Nest in shallow grass-lined hollow in damp ground under low shrub or grass tussock near shallow water.	None	None	Associated with wetlands.
16156	Solanum adenophorum	None	E	woodland with Acacia harpophylla	100 to 300 m	grey self-mulching cracking clay, hard pedal yellow or mottled-yellow duplex soil	undulating to level plain

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1, 10.9.6, 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6

Label	Regional Ecosystem (mandatory unless otherwise specified)
848	7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.38, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 9.3.1, 9.3.2, 9.3.3, 9.3.5, 9.3.6, 9.3.8, 9.3.10, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.24, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.13, 9.5.14, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.44, 10.3.2, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.20, 11.7.1, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.15, 11.11.16, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.11, 11.12.13, 11.12.14, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.2.11, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.12, 12.3.14, 12.3.15, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.5, 12.5.6, 12.5.7, 12.5.8, 12.5.10, 12.5.11, 12.5.12, 12.7.1, 12.7.2, 12.8.1, 12.8.2, 12.8.8, 12.8.10, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.13, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.20, 12.9-10.21, 12.9-10.23, 12.9-10.24, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.20, 12.11.21, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.20, 12.12.21, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.26, 12.12.27, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10
860	4.3.1, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.3.8, 4.3.10, 4.3.11, 4.5.3, 4.5.5, 4.5.6, 4.5.8, 4.5.9, 4.7.1, 4.7.7, 4.7.8, 4.9.6, 4.9.10, 4.9.12, 4.9.17, 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.12, 6.3.17, 6.3.18, 6.3.22, 6.3.24, 6.3.25, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.5.1, 6.5.2, 6.5.3, 6.5.5, 6.5.6, 6.5.7, 6.5.8, 6.5.9, 6.5.10, 6.5.11, 6.5.13, 6.5.14, 6.5.15, 6.5.16, 6.5.17, 6.5.18, 6.5.19, 6.6.2, 6.7.1, 6.7.2, 6.7.5, 6.7.6, 6.7.7, 6.7.9, 6.7.11, 6.7.12, 6.7.13, 6.7.14, 6.7.17, 6.9.3, 7.2.3, 7.2.4, 7.2.7, 7.2.11, 7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 8.1.5, 8.2.3, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.5.7, 8.9.1, 8.10.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.29, 8.12.31, 8.12.32, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.10, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.27, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.3, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.8.13, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.44, 10.3.2, 10.3.3, 10.3.5, 10.3.6, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.17, 10.3.20, 10.3.27, 10.3.28, 10.4.3, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.8, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.7.9, 10.7.10, 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11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.13, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.14, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.6, 12.5.7, 12.5.10, 12.5.12, 12.8.1, 12.8.8, 12.8.9, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.24, 12.8.25, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.21, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.23, 12.12.24, 12.12.25, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10.
1883	All regional ecosystems within the stream/wetland buffer as determined by VMA code.
16156	11.4.2, 11.4.8, 11.4.9, 11.7.1, 11.9.1

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

Class A (with urban areas masked as per SPP): 667.19ha

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 4 Plan: CNS15.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:

<https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new [property maps of assessable vegetation \(PMAV\)](#).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

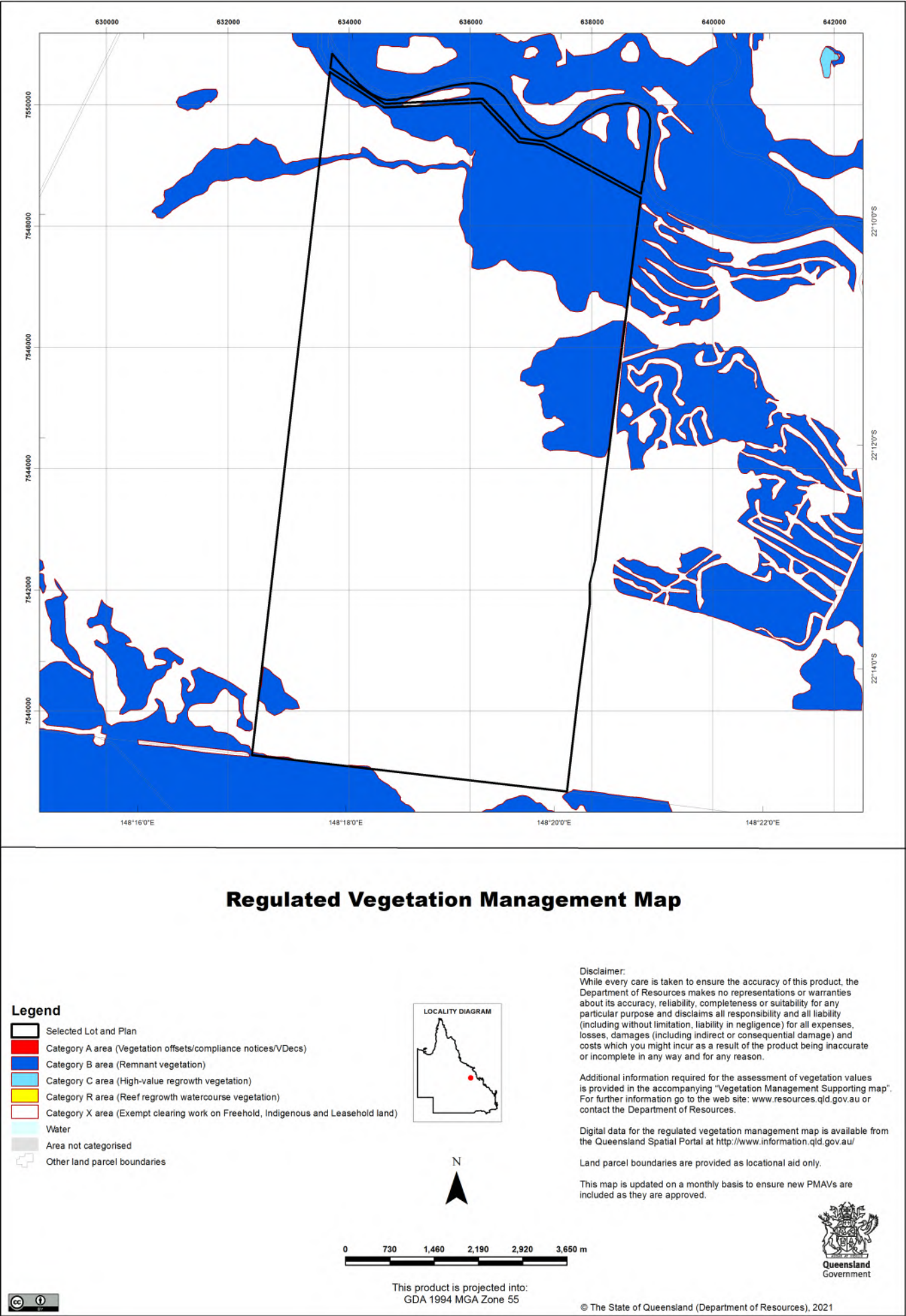
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

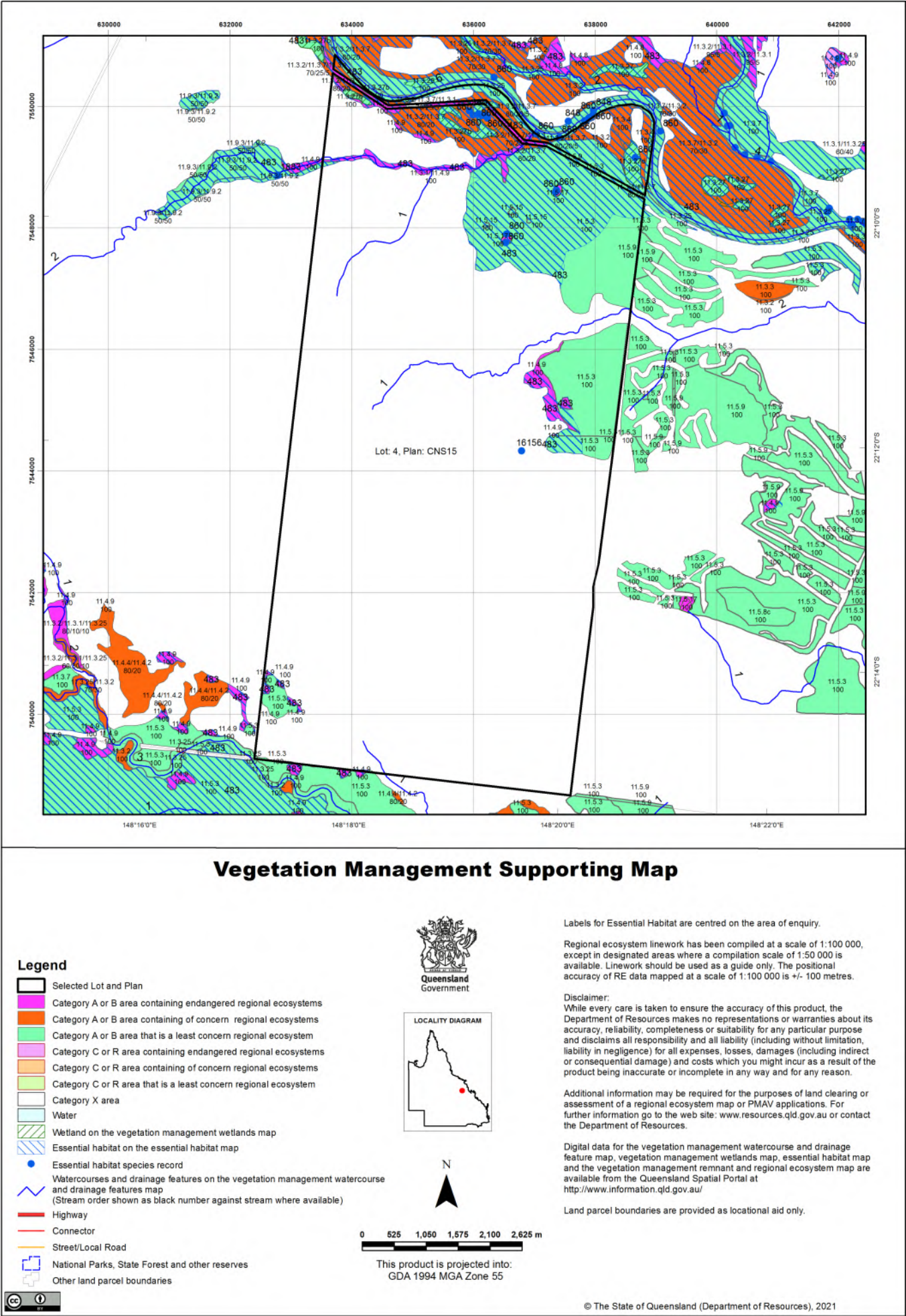
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

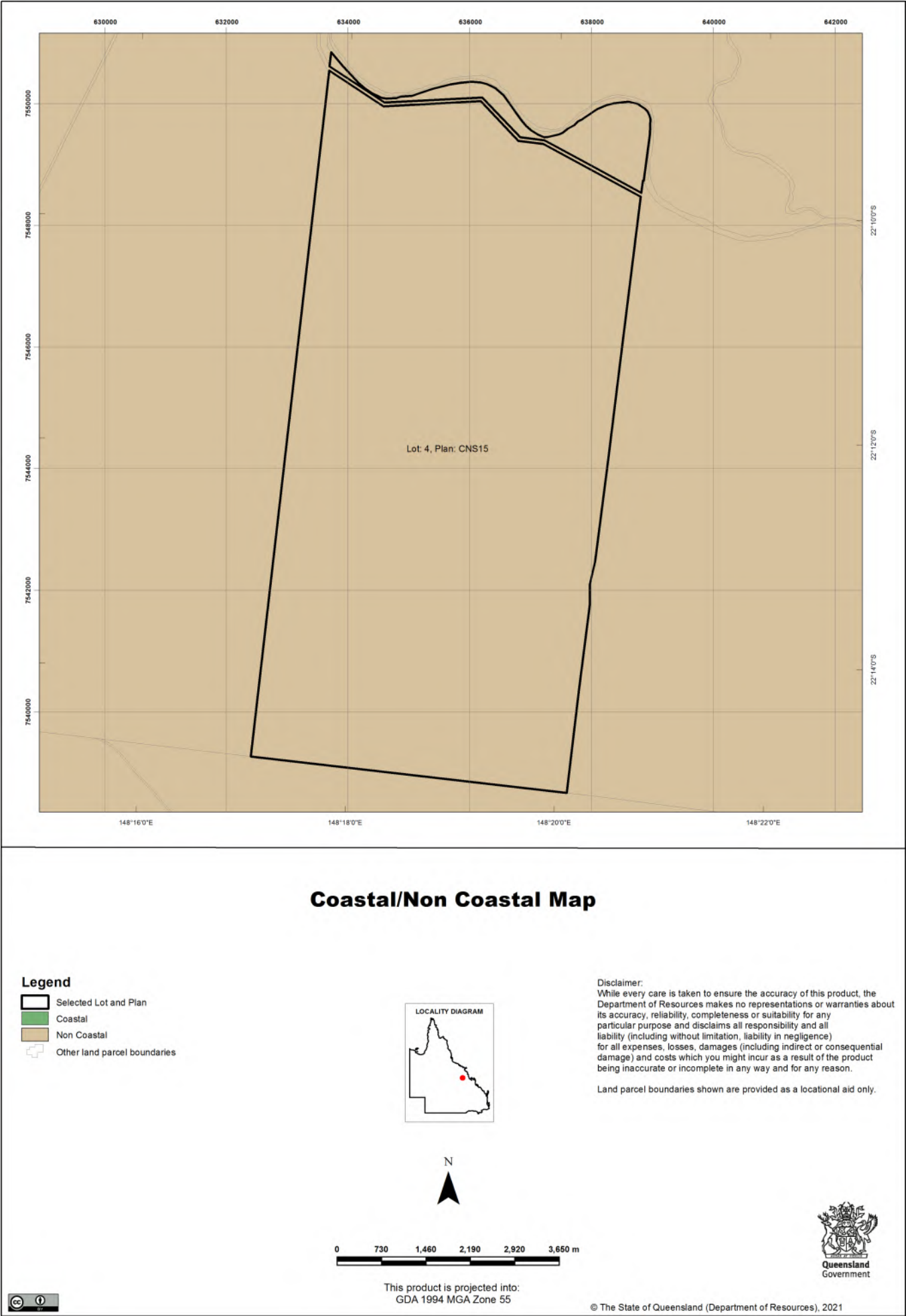
4.1 Regulated vegetation management map



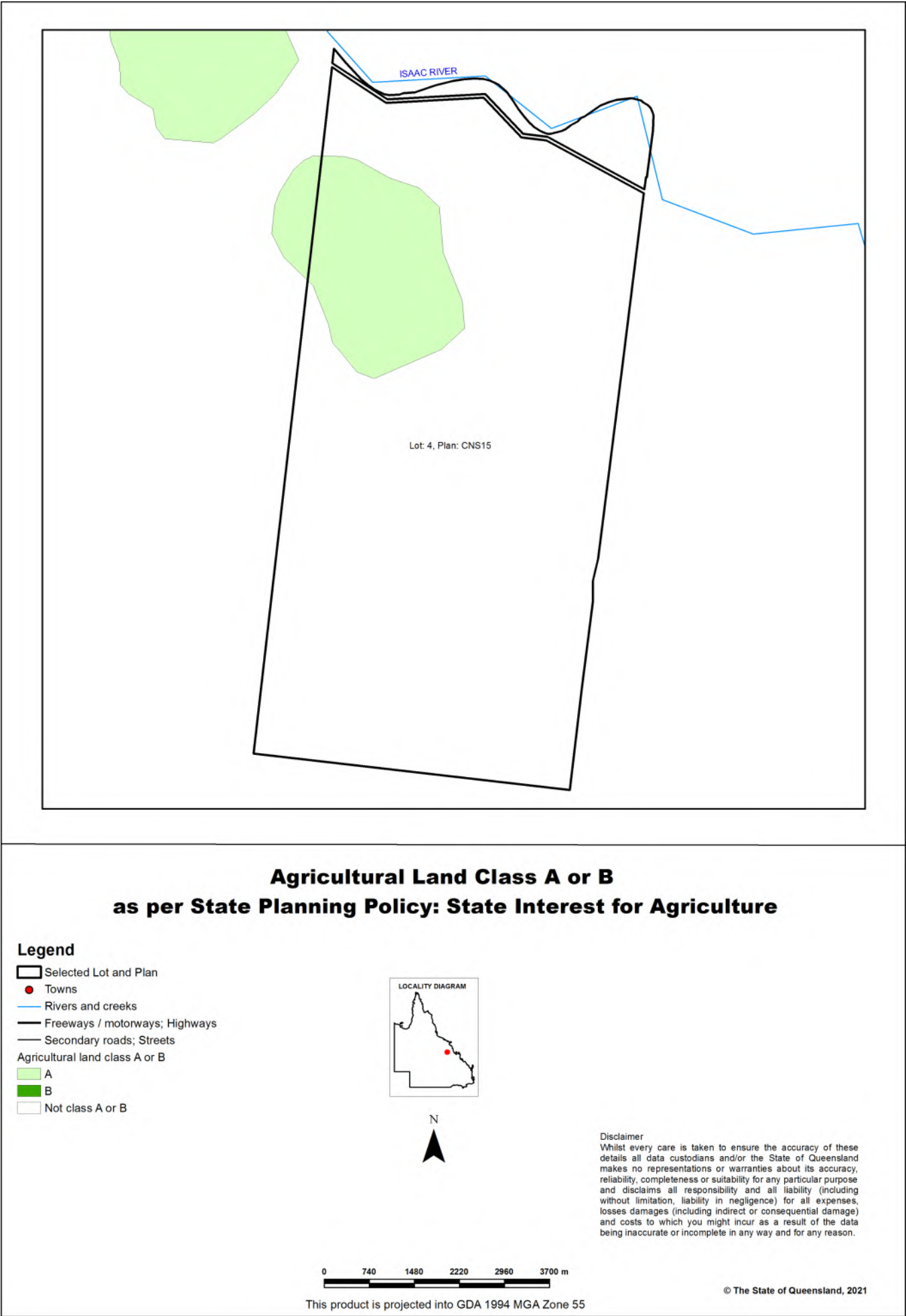
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](#) (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the [Flora survey guidelines](#). The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An [exempt clearing notification form](#) must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the [clearing permit application form](#).

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:

Phone 1300 130 372 (and select option four)

Email palm@des.qld.gov.au

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

5.5 Protected plants flora survey trigger map

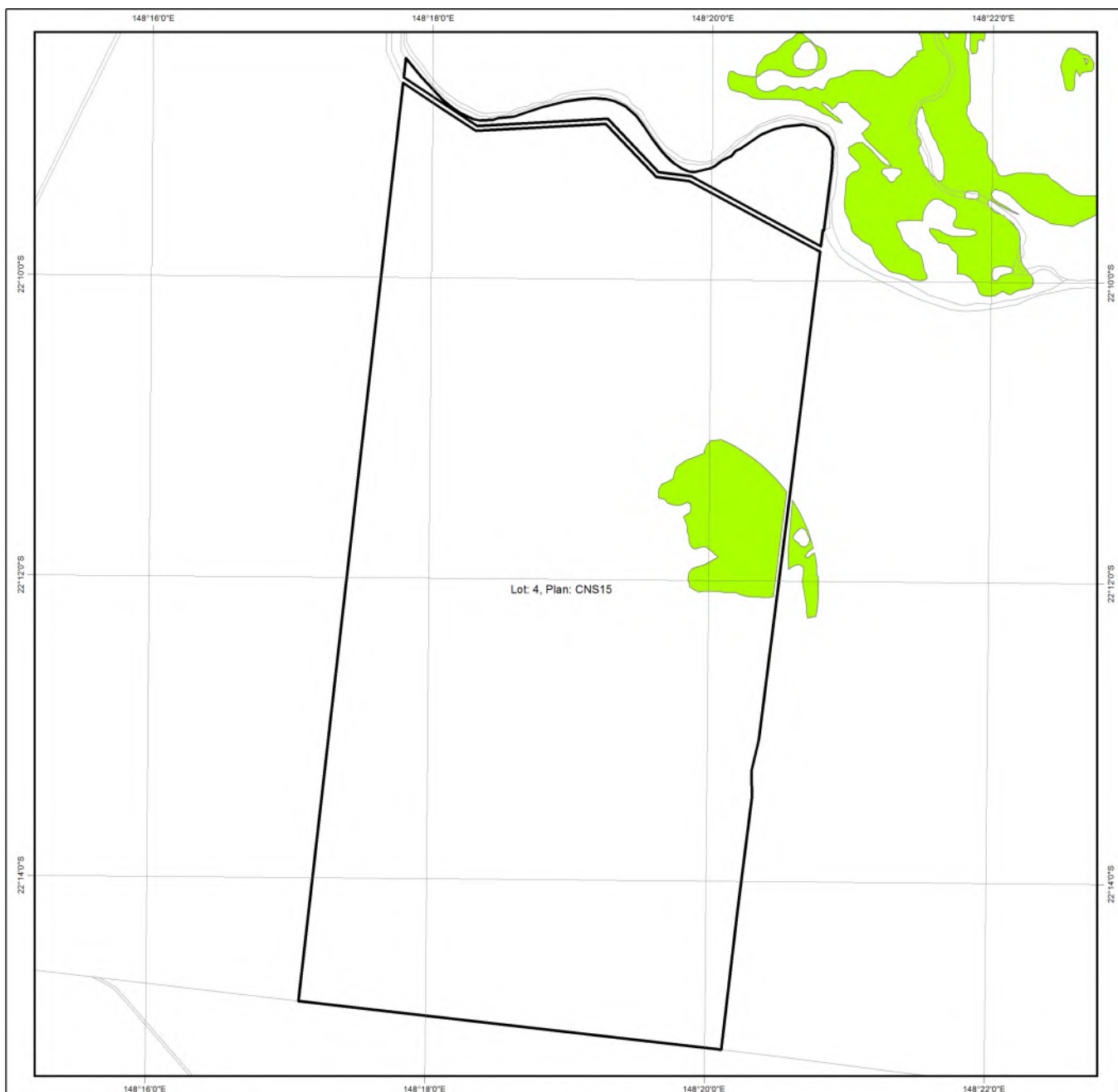
This map included may also be requested individually at: <https://apps.des.qld.gov.au/map-request/flora-survey-trigger/>.

Updates to the data informing the flora survey trigger map

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

Species information

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



Protected Plants Flora Survey Trigger Map

Legend

-  Selected Lot and Plan
-  High risk area
-  Other land parcel boundaries
-  Freeways / motorways / highways
-  Secondary roads / streets



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

This product is projected into:
GDA 1994 MGA Zone 55

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

Land parcel boundaries are provided as locational aid only.

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

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

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

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document [Spatial modelling in South East Queensland](#).

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document [Guideline - Requests to make, amend or revoke a koala habitat area determination](#).

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps>. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

- 1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
- 2) Does not include destroying standing vegetation by stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the [Planning Regulation 2017](#). More information on exempted development can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
 - the local government planning scheme makes the development assessable;
 - the premises includes an area that is both a koala priority area and a koala habitat area; and
 - the development does not involve interfering with koala habitat (defined above); and
- development in identified koala broad-hectare areas.

The [Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks](#) outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the [Nature Conservation \(Koala\) Conservation Plan 2017](#) prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

For further information on the koala protection framework:

Phone 13 QGOV (13 74 68)

Email koala.assessment@des.qld.gov.au

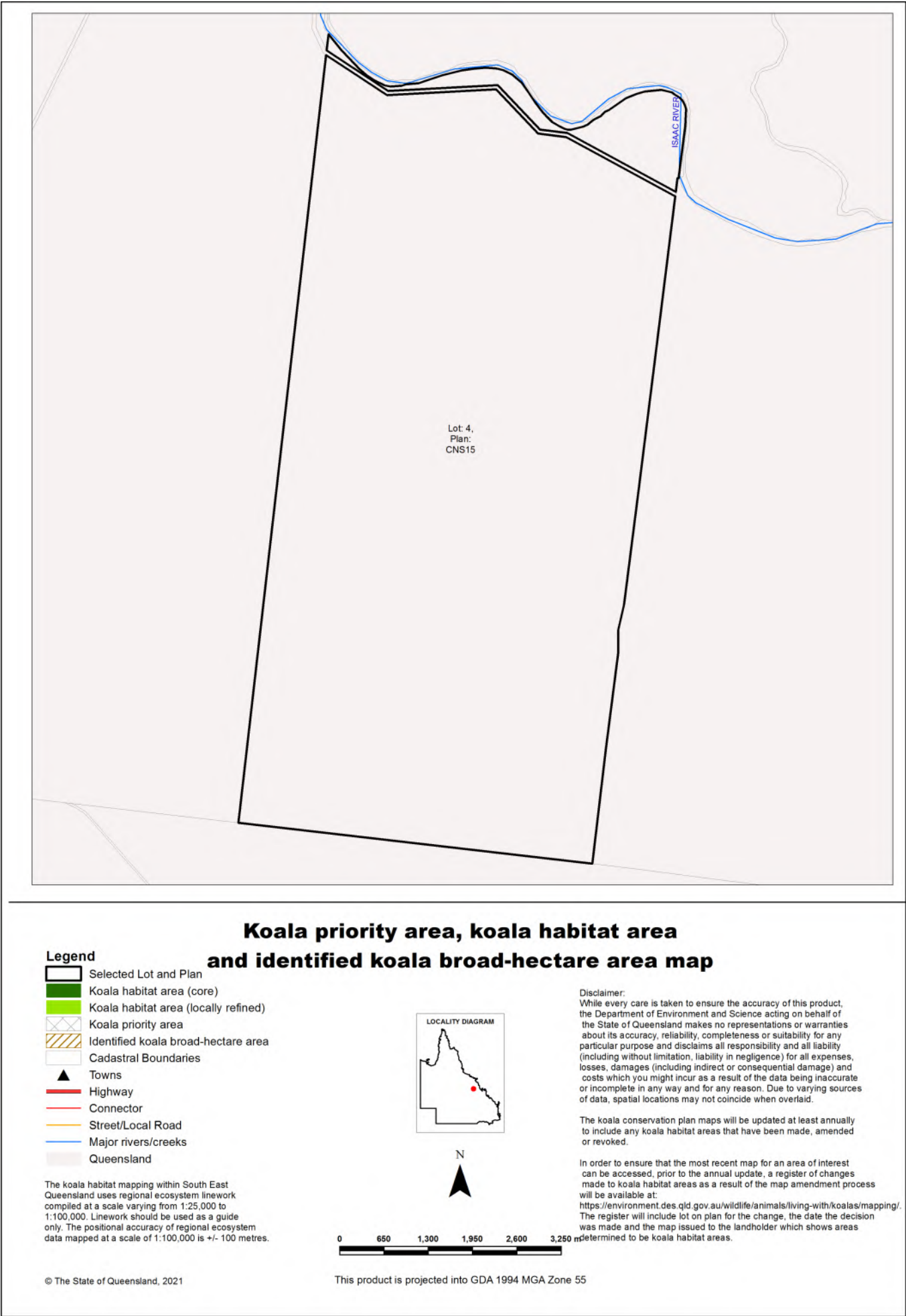
Visit <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>

7. Koala protection framework details for Lot: 4 Plan: CNS15

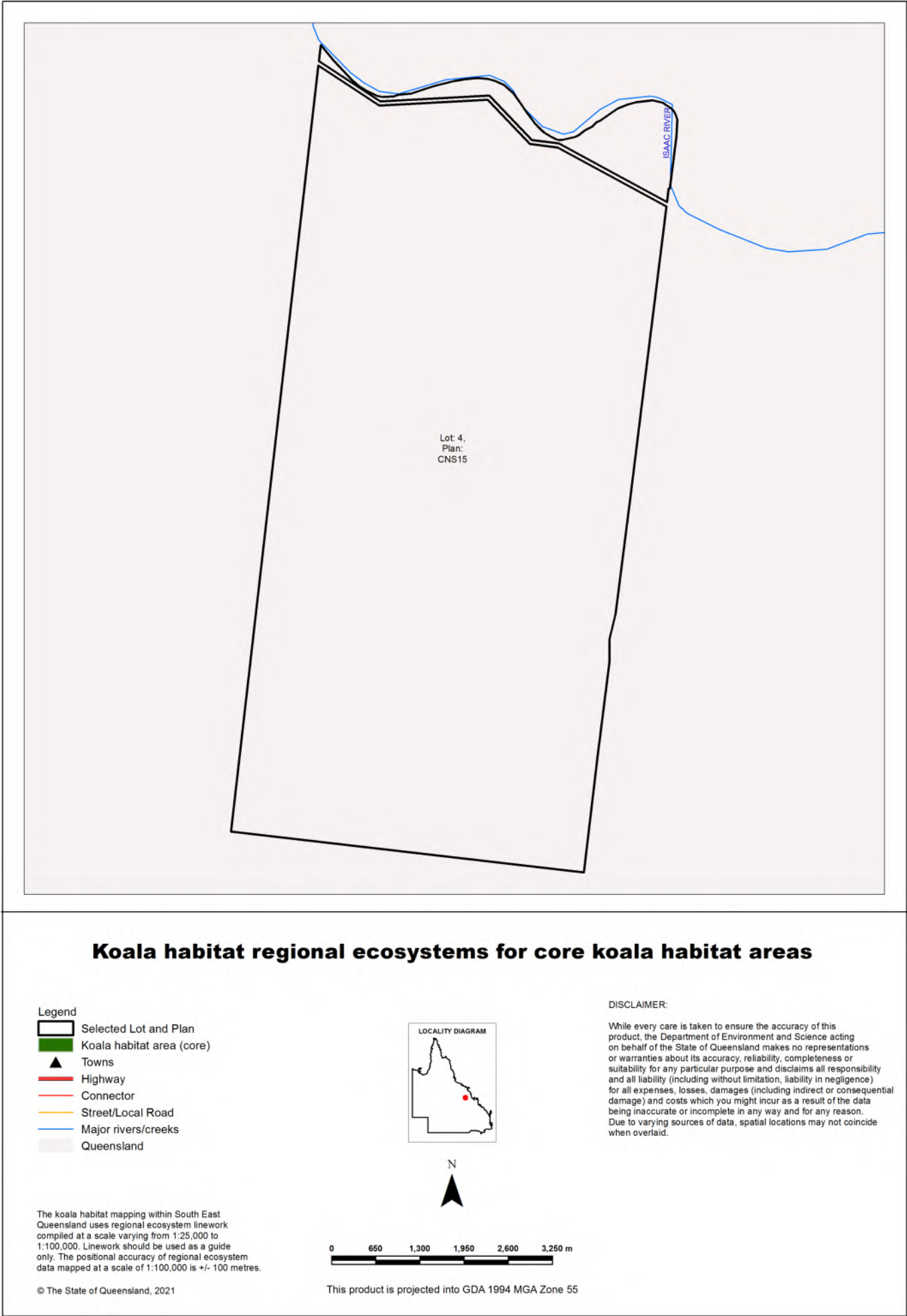
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Regional Development, Manufacturing and Water (Queensland Government) Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Protected plants and protected areas	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.des.qld.gov.au
• Koala mapping and regulations	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Agriculture, Water and the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office
• Harvesting timber in the Wet Tropics of Qld World Heritage area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au



Appendix B Site-based Attribute Scores



B.1 Inderi Study Area Site-based Attribute Scores





Inderi Offset Investigation Area - Habitat Quality Scores

		Matter Areas						
		Natural Grasslands TEC	Of Concern RegVeg (BVG 21b)	Of Concern RegVeg (BVG 30b)	Watercourse RE (BVG 30b)	Watercourse RE (BVG 11a)	Watercourse RE (BVG 21b)	11.8.11 NR
		Matter Area BioCondition Score (Bcmatter area) out of 10						
		4.44	3.38	4.48	4.44	7.08	3.38	4.53
Assessment Unit (AU)	AU BioCondition Score (BC AUx) out of 10	Weighted BioCondition Scores (WBC AUx)						
1a	4.44	4.44	-	2.77	4.44	-	-	-
4	3.38	-	3.38	-	-	-	3.38	-
2	7.08	-	-	-	-	7.08	-	-
1b	4.53	-	-	1.70	-	-	-	4.53
1	6.42	-	-	-	-	-	-	-
3	5.10	-	-	-	-	-	-	-



Inderi Study Area

AU

1

2

3

4

1a

1b

(blank)

Assessment Unit	2			1a		
Site	B1			B10		
Regional ecosystem	11.8.5			11.8.11		
Broad condition state	Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		66	3		0	0
Native plant species richness - trees (No.)	2	3	5	na	0	
Native plant species richness - shrubs (No.)	3	3	5	na	0	
Native plant species richness - grasses (No.)	6	7	5	11	5	2.5
Native plant species richness - forbs (No.)	16	8	2.5	17	8	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	15	14	5	na	0	
Tree sub-canopy height (m)	5	5	5	na	0	
Tree height - average			5			
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	13	8.5	5	na	0	
Tree sub-canopy cover (%)	3	1	2	na	0	
Tree cover - average			3.5			
Native shrub canopy cover (%)	2	2	5	na	0	
Native perennial grass cover (%)	60	14	1	43	38	3
Organic litter (%)	25	14	5	13	17	5
Large trees/ha - total	6	8	15	na		
Coarse woody debris (m/ha)	250	75	2	na		
Non-native plant cover (%)	0	15	5	0	10	5
Maximum site-based score			80			30
Site-based BioCondition score (out of 10)			7.75			6

Assessment Unit (AU)	2	1a	1b	4	1	3
AU BioCondition Score	7.08333333	4.44444444	4.52777778	3.375	6.41666667	5.10416667
AU Area						
AU Weighted BioCondition Score						

Inderi Study Area

Assessment Unit	2			2			2		
Site	B11			B16			B17		
Regional ecosystem	11.8.5			11.8.5			11.8.5		
Broad condition state	Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		66	3		100	5		100	5
Native plant species richness - trees (No.)	2	3	5	2	1	2.5	2	2	5
Native plant species richness - shrubs (No.)	3	3	5	3	1	2.5	3	1	2.5
Native plant species richness - grasses (No.)	6	8	5	6	6	5	6	5	2.5
Native plant species richness - forbs (No.)	16	6	2.5	16	7	2.5	16	4	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	15	13	5	15	13	5	15	13	5
Tree sub-canopy height (m)	5	5	5	5	4	5	5	4	5
Tree height - average			5			5			5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	13	32	3	13	42	3	13	19	5
Tree sub-canopy cover (%)	3	10	3	3	1	2	3	13	3
Tree cover - average			3			2.5			4
Native shrub canopy cover (%)	2	3	5	2	0	0	2	0	0
Native perennial grass cover (%)	60	30	3	60	19	1	60	7	1
Organic litter (%)	25	17	5	25	13	5	25	14	5
Large trees/ha - total	6	6	15	6	6	15	6	4	10
Coarse woody debris (m/ha)	250	120	2	250	290	5	250	280	5
Non-native plant cover (%)	0	10	5	0	20	5	0	25	3
Maximum site-based score			80			80			80
Site-based BioCondition score (out of 10)			7.9375			7			6.3125

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit	1b			1b			1b			2	
Site	B2			B3			B4			B5	
Regional ecosystem	11.8.11			11.8.11			11.8.11			11.8.5	
Broad condition state	Non-Remnant			Non-Remnant			Non-Remnant			Remnant	
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value
Recruitment of woody perennial species (%)		0	0		0	0		0	0		100
Native plant species richness - trees (No.)	na	0		na	0		na	0		2	3
Native plant species richness - shrubs (No.)	na	0		na	0		na	0		3	2
Native plant species richness - grasses (No.)	11	5	2.5	11	5	2.5	11	7	2.5	6	6
Native plant species richness - forbs (No.)	17	6	2.5	17	5	2.5	17	4	0	16	5
Tree emergent height (m)	na	0		na	0		na	0		na	0
Tree canopy height (m)	na	0		na	0		na	0		15	11
Tree sub-canopy height (m)	na	0		na	0		na	0		5	5
Tree height - average											
Tree emergent cover (%)	na	0		na	0		na	0		na	0
Tree canopy cover (%)	na	0		na	0		na	0		13	8
Tree sub-canopy cover (%)	na	0		na	0		na	0		3	5
Tree cover - average											
Native shrub canopy cover (%)	na	0		na	0		na	0		2	0
Native perennial grass cover (%)	43	14	1	43	14	1	43	10	1	60	29
Organic litter (%)	13	6	3	13	6	3	13	8	5	25	14
Large trees/ha - total	na			na			na			6	2
Coarse woody debris (m/ha)	na			na			na			250	740
Non-native plant cover (%)	0	40	3	0	40	3	0	25	3	0	15
Maximum site-based score			30			30			30		
Site-based BioCondition score (out of 10)			4			4			3.83333333		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit		1b			1b			1b			
Site		B6			B7			B8			
Regional ecosystem		11.8.11			11.8.11			11.8.11			
Broad condition state		Non-Remnant			Non-Remnant			Non-Remnant			
Biocondition attribute	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark
Recruitment of woody perennial species (%)	5		0	0		0	0		0	0	
Native plant species richness - trees (No.)	5	na	0		na	0		na	0		2
Native plant species richness - shrubs (No.)	2.5	na	0		na	0		na	0		3
Native plant species richness - grasses (No.)	5	11	6	2.5	11	5	2.5	11	5	2.5	6
Native plant species richness - forbs (No.)	2.5	17	7	2.5	17	6	2.5	17	5	2.5	16
Tree emergent height (m)		na	0		na	0		na	0		na
Tree canopy height (m)	5	na	0		na	0		na	0		15
Tree sub-canopy height (m)	5	na	0		na	0		na	0		5
Tree height - average	5										
Tree emergent cover (%)		na	0		na	0		na	0		na
Tree canopy cover (%)	5	na	0		na	0		na	0		13
Tree sub-canopy cover (%)	5	na	0		na	0		na	0		3
Tree cover - average	5										
Native shrub canopy cover (%)	0	na	0		na	0		na	0		2
Native perennial grass cover (%)	1	43	19	1	43	12	1	43	16	1	60
Organic litter (%)	5	13	14	5	13	7	5	13	10	5	25
Large trees/ha - total	5	na			na			na			6
Coarse woody debris (m/ha)	2	na			na			na			250
Non-native plant cover (%)	5	0	25	3	0	15	5	0	15	5	0
Maximum site-based score	80			30			30			30	
Site-based BioCondition score (out of 10)	6			4.66666667			5.33333333			5.33333333	

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit	2		1a			4			4		
Site	B9		HQ1			HQ10			HQ11		
Regional ecosystem	11.8.5		11.8.11			11.3.3a			11.3.3a		
Broad condition state	Remnant		Remnant			Remnant			Remnant		
Biocondition attribute	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)	100	5		0	0		100	5		100	5
Native plant species richness - trees (No.)	2	5	na	0		3	2	2.5	3	1	2.5
Native plant species richness - shrubs (No.)	2	2.5	na	0		5	7	5	5	2	2.5
Native plant species richness - grasses (No.)	8	5	11	7	2.5	12	8	2.5	12	4	2.5
Native plant species richness - forbs (No.)	7	2.5	17	2	0	15	4	2.5	15	1	0
Tree emergent height (m)	0		na	0		na	0		na	0	
Tree canopy height (m)	14	5	na	0		18	6	3	18	8	3
Tree sub-canopy height (m)	6	5	na	0		10	0	0	10	0	0
Tree height - average		5						1.5			1.5
Tree emergent cover (%)	0		na	0		na	0		na	0	
Tree canopy cover (%)	26	5	na	0		28	18.8	5	28	18.4	5
Tree sub-canopy cover (%)	21	3	na	0		5	0	0	5	0	0
Tree cover - average		4						2.5			2.5
Native shrub canopy cover (%)	0	0	na	0		4	2.8	5	4	0	0
Native perennial grass cover (%)	27	1	43	11	1	45	6	1	45	0	0
Organic litter (%)	14	5	13	6.6	5	30	7.6	3	30	14	3
Large trees/ha - total	12	15	na			10	0	0	10	0	0
Coarse woody debris (m/ha)	280	5	na			285	670	2	285	50	2
Non-native plant cover (%)	20	5	0	62	0	0	60	0	0	80	0
Maximum site-based score		80			30			80			80
Site-based BioCondition score (out of 10)		7.5			2.83333333			4.0625			2.6875

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit	1a			1a			1a			1	
Site	HQ12			HQ2			HQ3			HQ4	
Regional ecosystem	11.8.11			11.8.11			11.8.11			11.8.11	
Broad condition state	Remnant			Remnant			Remnant			Remnant	
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value
Recruitment of woody perennial species (%)		0	0		0	0		0	0		0
Native plant species richness - trees (No.)	na	0		na	0		na	0		na	0
Native plant species richness - shrubs (No.)	na	0		na	0		na	0		na	0
Native plant species richness - grasses (No.)	11	9	2.5	11	9	2.5	11	9	2.5	11	10
Native plant species richness - forbs (No.)	17	5	2.5	17	2	0	17	2	0	17	5
Tree emergent height (m)	na	0		na	0		na	0		na	0
Tree canopy height (m)	na	0		na	0		na	0		na	0
Tree sub-canopy height (m)	na	0		na	0		na	0		na	0
Tree height - average											
Tree emergent cover (%)	na	0		na	0		na	0		na	0
Tree canopy cover (%)	na	0		na	0		na	0		na	0
Tree sub-canopy cover (%)	na	0		na	0		na	0		na	0
Tree cover - average											
Native shrub canopy cover (%)	na	0		na	0		na	0		na	0
Native perennial grass cover (%)	43	35	3	43	24.4	3	43	14.4	1	43	41
Organic litter (%)	13	20	5	13	16.6	5	13	14.6	5	13	16
Large trees/ha - total	na			na			na			na	
Coarse woody debris (m/ha)	na			na			na			na	
Non-native plant cover (%)	0	20	5	0	7	5	0	55	0	0	10
Maximum site-based score			30			30			30		
Site-based BioCondition score (out of 10)			6			5.16666667			2.83333333		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit		3			3			1a			
Site		HQ5			HQ6			HQ7			
Regional ecosystem		11.4.2			11.4.2			11.8.11			
Broad condition state		Non-Remnant			Non-Remnant			Remnant			
Biocondition attribute	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark
Recruitment of woody perennial species (%)	0		100	5		100	5		0	0	
Native plant species richness - trees (No.)		4	3	2.5	4	1	2.5	na	0		4
Native plant species richness - shrubs (No.)		5	3	2.5	5	2	2.5	na	0		5
Native plant species richness - grasses (No.)	5	8	12	5	8	12	5	11	4	2.5	8
Native plant species richness - forbs (No.)	2.5	7	3	2.5	7	4	2.5	17	4	0	7
Tree emergent height (m)		na	0		na	0		na	0		na
Tree canopy height (m)		20	9	3	20	12	3	na	0		20
Tree sub-canopy height (m)		8	3	3	8	5	3	na	0		8
Tree height - average				3			3				
Tree emergent cover (%)		na	0		na	0		na	0		na
Tree canopy cover (%)		25	0.2	0	25	9.6	2	na	0		25
Tree sub-canopy cover (%)		5	2.2	2	5	0	0	na	0		5
Tree cover - average				1			1				
Native shrub canopy cover (%)		13	0.4	0	13	0	0	na	0		13
Native perennial grass cover (%)	5	16	60	5	16	27	5	43	7	1	16
Organic litter (%)	5	30	12	3	30	14	3	13	9	5	30
Large trees/ha - total		18	0	0	18	4	5	na			18
Coarse woody debris (m/ha)		109	130	5	109	200	5	na			109
Non-native plant cover (%)	5	0	10	5	0	20	5	0	50	3	0
Maximum site-based score	30			80			80			30	
Site-based BioCondition score (out of 10)	7.5			4.9375			5.5625			3.83333333	

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Inderi Study Area

Assessment Unit	3		1		
Site	HQ8		HQ9		
Regional ecosystem	11.4.2		11.8.11		
Broad condition state	Non-Remnant		Remnant		
Biocondition attribute	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)	100	5		0	0
Native plant species richness - trees (No.)	3	2.5	na	0	
Native plant species richness - shrubs (No.)	4	2.5	na	0	
Native plant species richness - grasses (No.)	9	5	11	10	5
Native plant species richness - forbs (No.)	6	2.5	17	3	0
Tree emergent height (m)	0		na	0	
Tree canopy height (m)	12	3	na	0	
Tree sub-canopy height (m)	5	3	na	0	
Tree height - average		3			
Tree emergent cover (%)	0		na	0	
Tree canopy cover (%)	0	0	na	0	
Tree sub-canopy cover (%)	0	0	na	0	
Tree cover - average		0			
Native shrub canopy cover (%)	0	0	na	0	
Native perennial grass cover (%)	36	5	43	37	3
Organic litter (%)	12	3	13	18	5
Large trees/ha - total	2	5	na		
Coarse woody debris (m/ha)	60	5	na		
Non-native plant cover (%)	55	0	0	45	3
Maximum site-based score		80			30
Site-based BioCondition score (out of 10)		4.8125			5.33333333

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

B.2 Wynette North Study Area Site-based Attribute Scores





Wynette North Offset Investigation Area - Habitat Quality Scores

		Matter Areas					
		Poplar Box TEC (RE 11.3.2)	koala	greater glider	squatter pigeon (breeding and foraging)	squatter pigeon (foraging)	Solanum adenophorum ornamental snake
		Matter Area BioCondition Score (Bcmatter area) out of 10					
		6.14	6.05	6.38	5.52	3.07	
Assessment Unit (AU)	AU BioCondition Score (BC AUx) out of 10	Weighted BioCondition Scores (WBC AUx)					
1	5.78	-	-	-	-	-	-
2	5.94	1.17	2.03	-	-	-	-
3	6.00	0.05	0.09	-	-	-	-
4	5.06	0.45	0.79	-	-	-	-
5	4.44	0.20	0.34	-	-	-	-
6	6.88	0.26	0.46	-	-	-	-
7	7.25	0.31	0.54	-	-	-	-
8	6.30	-	-	-	-	2.94	0.88
9	6.00	-	-	-	-	1.25	0.37
10	4.08	-	-	-	-	1.33	0.40
11	2.03	-	-	-	-	-	1.42
12	6.79	0.95	1.65	1.64	-	-	-
13	6.27	2.66	-	4.60	-	-	-
14	5.97	0.09	0.15	0.15	-	-	-
15	3.34	-	-	-	-	-	-
18	3.31	-	-	-	-	-	-
16	2.88	-	-	-	-	-	-
17	2.69	-	-	-	-	-	-

Endangered RE (BVG34d)	Of Concern RE (BVG17a)	Of Concern RE (BVG16c)	Watercourse RE (BVG25a)	Watercourse RE (BVG17a)	Watercourse RE (BVG16c)	Watercourse RE (BVG16a)	Endangered RE (BVG25a)
5.97	5.94	5.15	5.78	5.94	5.06	6.88	5.98
-	-	-	5.78	-	-	-	3.10
-	5.94	-	-	5.94	-	-	-
-	-	0.53	-	-	-	-	-
-	-	4.61	-	-	5.06	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	6.88	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	2.02
-	-	-	-	-	-	-	0.86
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
5.97	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-



Wynette North Study Area

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Assessment Unit	5			12		
Site	B1			B10		
Regional ecosystem	11.3.4			11.5.3		
Broad condition state	regrowth			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		66	3		50	3
Native plant species richness - trees (No.)	4	3	2.5	6	2	2.5
Native plant species richness - shrubs (No.)	2	1	2.5	6	7	5
Native plant species richness - grasses (No.)	7	0	0	6	4	2.5
Native plant species richness - forbs (No.)	10	5	2.5	10	5	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	22	16	5	16	15	5
Tree sub-canopy height (m)	12	5	3	7	5	5
Tree height - average			4			5
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	17	15	5	20	18	5
Tree sub-canopy cover (%)	5	0	0	3	3	5
Tree cover - average			2.5			5
Native shrub canopy cover (%)	1	0	0	3	0.5	3
Native perennial grass cover (%)	43	0	0	19	22	5
Organic litter (%)	20	19	5	20	39	5
Large trees/ha - total	35	2	5	10	4	5
Coarse woody debris (m/ha)	384	255	5	314	180	5
Non-native plant cover (%)	0	60	0	0	8	5
Maximum site-based score	80			80		
Site-based BioCondition score (out of 10)	4			6.6875		

Assessment Unit (AU)	5	12	9	11	10	13
AU BioCondition Score	4.4375	6.625	5.89583333	2.03125	4.08333333	6.109375
AU Area						
AU Weighted BioCondition Score						

Wynette North Study Area

Assessment Unit	9			9			12		
Site	B11			B12			B13		
Regional ecosystem	11.4.9			11.4.9			11.5.3		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		75	5		66	3		100	5
Native plant species richness - trees (No.)	5	4	2.5	5	3	2.5	6	2	2.5
Native plant species richness - shrubs (No.)	10	12	5	10	11	5	6	7	5
Native plant species richness - grasses (No.)	5	3	2.5	5	4	2.5	6	5	2.5
Native plant species richness - forbs (No.)	10	10	5	10	4	2.5	10	4	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	13	11	5	13	10	5	16	14	5
Tree sub-canopy height (m)	8	6	5	8	6	5	7	6	5
Tree height - average			5			5			5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	12.5	5	25	14	5	20	16	5
Tree sub-canopy cover (%)	10	11	5	10	4	2	3	3	5
Tree cover - average			5			3.5			5
Native shrub canopy cover (%)	5	16.5	3	5	15.5	3	3	0.5	3
Native perennial grass cover (%)	20	1	0	20	4	1	19	20	5
Organic litter (%)	45	49	5	45	55	5	20	35	5
Large trees/ha - total	45	22	5	45	2	5	10	8	10
Coarse woody debris (m/ha)	1200	929	5	1200	453	2	314	470	5
Non-native plant cover (%)	0	35	3	0	30	3	0	15	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	6.375			5.375			7.5625		

[illegible]

Wynette North Study Area

Assessment Unit	11			10			12		
Site	B14			B15			B16		
Regional ecosystem	11.4.9			11.4.9			11.5.3		
Broad condition state	disturbed other			regrowth			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		0	0		66	3		100	5
Native plant species richness - trees (No.)	5	0	0	5	3	2.5	6	2	2.5
Native plant species richness - shrubs (No.)	10	4	2.5	10	6	2.5	6	4	2.5
Native plant species richness - grasses (No.)	5	1	0	5	4	2.5	6	5	2.5
Native plant species richness - forbs (No.)	10	8	2.5	10	4	2.5	10	7	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	13	1	0	13	9	3	16	17	5
Tree sub-canopy height (m)	8	0	0	8	4	3	7	6	5
Tree height - average			0			3			5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	0	0	25	20	5	20	12	5
Tree sub-canopy cover (%)	10	0	0	10	3.5	2	3	1	2
Tree cover - average			0			3.5			3.5
Native shrub canopy cover (%)	5	13.5	3	5	5	5	3	0.5	3
Native perennial grass cover (%)	20	2	1	20	2	1	19	13	3
Organic litter (%)	45	18	3	45	30	5	20	28	5
Large trees/ha - total	45	0	0	45	8	5	10	2	5
Coarse woody debris (m/ha)	1200	195	2	1200	365	2	314	30	0
Non-native plant cover (%)	0	45	3	0	30	3	0	10	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	2.125			5.0625			5.5625		

Assessment Unit (AU)	18	16	17
AU BioCondition Score	3.3125	2.875	2.6875
AU Area			
AU Weighted BioCondition Score			

Wynette North Study Area

Assessment Unit	13			13			8		
Site	B17			B18			B19		
Regional ecosystem	11.5.9b			11.5.9b			11.4.8		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		75	5		75	5		66	3
Native plant species richness - trees (No.)	3	4	5	3	4	5	3	3	5
Native plant species richness - shrubs (No.)	6	13	5	6	9	5	10	9	5
Native plant species richness - grasses (No.)	9	5	2.5	9	5	2.5	9	8	2.5
Native plant species richness - forbs (No.)	11	6	2.5	11	6	2.5	7	11	5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	17	15	5	17	16	5	17	15	5
Tree sub-canopy height (m)	8	6	5	8	7	5	9	6	3
Tree height - average			5			5			4
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	14	5	25	19	5	40	18	2
Tree sub-canopy cover (%)	5	6	5	5	8	5	3	20	3
Tree cover - average			5			5			2.5
Native shrub canopy cover (%)	10	7.5	5	10	0	0	5	2	3
Native perennial grass cover (%)	26	12	1	26	17	3	20	8	1
Organic litter (%)	30	35	5	30	38	5	37	52	5
Large trees/ha - total	20	6	5	20	2	5	42	28	10
Coarse woody debris (m/ha)	342	376	5	342	551	5	813	469	5
Non-native plant cover (%)	0	15	5	0	15	5	0	15	5
Maximum site-based score			80			80			80
Site-based BioCondition score (out of 10)			7			6.625			7

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	6			5			2		
Site	B2			B3			B4		
Regional ecosystem	11.3.25			11.3.4			11.3.2		
Broad condition state	remnant			regrowth			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		75	5
Native plant species richness - trees (No.)	4	4	5	4	3	2.5	2	4	5
Native plant species richness - shrubs (No.)	2	6	5	2	2	5	2	5	5
Native plant species richness - grasses (No.)	8	1	0	7	2	2.5	9	5	2.5
Native plant species richness - forbs (No.)	12	6	2.5	10	6	2.5	17	7	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	23	18	5	22	17	5	18	15	5
Tree sub-canopy height (m)	na	6		12	6	3	na	0	
Tree height - average			5			4			5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	22	42	5	17	8.5	5	40	25	5
Tree sub-canopy cover (%)	na	0		5	0	0	na	0	
Tree cover - average			5			2.5			5
Native shrub canopy cover (%)	1	1.5	5	1	0	0	2	1	5
Native perennial grass cover (%)	12	0	0	43	1	0	35	4	1
Organic litter (%)	15	45	3	20	26	5	30	39	5
Large trees/ha - total	21	50	15	35	6	5	22	2	5
Coarse woody debris (m/ha)	375	245	5	384	50	2	307	351	5
Non-native plant cover (%)	0	70	0	0	45	3	0	40	3
Maximum site-based score			80			80			80
Site-based BioCondition score (out of 10)			6.9375			4.875			6.75

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	6			3			3		
Site	B5			B6			B7		
Regional ecosystem	11.3.25			11.3.3			11.3.3		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		66	3		100	5		50	3
Native plant species richness - trees (No.)	4	3	2.5	3	2	2.5	3	2	2.5
Native plant species richness - shrubs (No.)	2	4	5	5	1	0	5	1	0
Native plant species richness - grasses (No.)	8	3	2.5	12	3	2.5	12	2	0
Native plant species richness - forbs (No.)	12	9	2.5	15	6	2.5	15	7	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	23	18	5	18	19	5	18	19	5
Tree sub-canopy height (m)	na	0		10	7	5	10	6	3
Tree height - average			5			5			4
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	22	30.5	5	28	47	5	28	49	5
Tree sub-canopy cover (%)	na	0		5	4.5	5	5	1	2
Tree cover - average			5			5			3.5
Native shrub canopy cover (%)	1	17.5	3	4	0	0	4	0	0
Native perennial grass cover (%)	12	17	5	45	5	1	45	7	1
Organic litter (%)	15	36	3	30	87	3	30	71	3
Large trees/ha - total	21	20	10	10	10	15	10	44	15
Coarse woody debris (m/ha)	375	377	5	285	556	5	285	358	5
Non-native plant cover (%)	0	40	3	0	8	5	0	5	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	6.8125			6.4375			5.5625		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	10			11			13		
Site	B8			B9			HQ10		
Regional ecosystem	11.4.9			11.4.9			11.5.9b		
Broad condition state	regrowth			disturbed other			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		0	0		100	5
Native plant species richness - trees (No.)	5	3	2.5	5	0	0	3	5	5
Native plant species richness - shrubs (No.)	10	11	5	10	4	2.5	6	6	5
Native plant species richness - grasses (No.)	5	4	2.5	5	2	2.5	9	5	2.5
Native plant species richness - forbs (No.)	10	5	2.5	10	7	2.5	11	3	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	13	10	5	13	1	0	17	14	5
Tree sub-canopy height (m)	8	4	3	8	0	0	8	0	0
Tree height - average			4			0			2.5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	13	5	25	0	0	25	11.6	2
Tree sub-canopy cover (%)	10	7.5	5	10	0	0	5	10.6	3
Tree cover - average			5			0			2.5
Native shrub canopy cover (%)	5	4.5	5	5	3	5	10	2	3
Native perennial grass cover (%)	20	5	1	20	1	0	26	12	1
Organic litter (%)	45	14	3	45	13	3	30	22	5
Large trees/ha - total	45	0	0	45	0	0	20	8	5
Coarse woody debris (m/ha)	1200	850	5	1200	90	0	342	20	0
Non-native plant cover (%)	0	55	0	0	60	0	0	40	3
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	5.0625			1.9375			5.25		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	1			8			13		
Site	HQ12			HQ13			HQ15		
Regional ecosystem	11.3.1			11.4.8			11.5.9b		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		0	0		100	5		75	5
Native plant species richness - trees (No.)	3	7	5	3	6	5	3	6	5
Native plant species richness - shrubs (No.)	5	9	5	10	9	5	6	3	2.5
Native plant species richness - grasses (No.)	4	3	2.5	9	5	2.5	9	5	2.5
Native plant species richness - forbs (No.)	8	3	2.5	7	5	2.5	11	5	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	14	14	5	17	16	5	17	16	5
Tree sub-canopy height (m)	4	0	0	9	0	0	8	0	0
Tree height - average			2.5			2.5			2.5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	29	23	5	40	26.3	5	25	22.3	5
Tree sub-canopy cover (%)	9	22.4	3	3	9.7	3	5	0	0
Tree cover - average			4			4			2.5
Native shrub canopy cover (%)	8	9.8	5	5	10.5	3	10	0	0
Native perennial grass cover (%)	8	8.4	5	20	2.4	1	26	27	5
Organic litter (%)	34	38.6	5	37	47.8	5	30	17	5
Large trees/ha - total	170	4	5	42	12	5	20	6	5
Coarse woody debris (m/ha)	1752	270	2	813	210	2	342	40	2
Non-native plant cover (%)	0	35	3	0	15	5	0	10	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	5.8125			5.9375			5.5625		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	9			2			1		
Site	HQ16			HQ18			HQ2		
Regional ecosystem	11.4.9			11.3.2			11.3.1		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		50	3
Native plant species richness - trees (No.)	5	7	5	2	3	5	3	5	5
Native plant species richness - shrubs (No.)	10	12	5	2	8	5	5	10	5
Native plant species richness - grasses (No.)	5	2	2.5	9	5	2.5	4	4	5
Native plant species richness - forbs (No.)	10	3	2.5	17	3	0	8	4	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	13	14	5	18	14	5	14	12	5
Tree sub-canopy height (m)	8	0	0	na	0		4	0	0
Tree height - average			2.5			5			2.5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	25.5	5	40	38.6	5	29	18.6	5
Tree sub-canopy cover (%)	10	13.2	5	na	0		9	15.4	5
Tree cover - average			5			5			5
Native shrub canopy cover (%)	5	32.2	3	2	1.4	5	8	1.3	3
Native perennial grass cover (%)	20	0	0	35	2	0	8	4	3
Organic litter (%)	45	44.6	5	30	18	5	34	20.6	5
Large trees/ha - total	45	10	5	22	12	10	170	0	0
Coarse woody debris (m/ha)	1200	290	2	307	190	5	1752	640	2
Non-native plant cover (%)	0	5	5	0	30	3	0	60	0
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	5.9375			6.9375			5.125		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	14			7			7		
Site	HQ20			HQ3a			HQ3b		
Regional ecosystem	11.5.17			11.3.27b			11.3.27b		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		0	0
Native plant species richness - trees (No.)	3	2	2.5	1	4	5	na	0	
Native plant species richness - shrubs (No.)	1	2	5	1	4	5	na	0	
Native plant species richness - grasses (No.)	3	3	5	3	5	5	1	5	5
Native plant species richness - forbs (No.)	7	4	2.5	6	7	5	9	4	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	18	15	5	16	18	5	na	0	
Tree sub-canopy height (m)	8	0	0	10	0	0	na	0	
Tree height - average			2.5			2.5			
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	41	22.4	5	40	77.1	5	na	0	
Tree sub-canopy cover (%)	6	0	0	2	25	3	na	0	
Tree cover - average			2.5			4			
Native shrub canopy cover (%)	3	0.4	3	na	0		na	0	
Native perennial grass cover (%)	20	24.4	5	3	2.2	3	6	84	5
Organic litter (%)	31	34.6	5	15	73.6	3	na	3	
Large trees/ha - total	29	4	5	28	26	10	na		
Coarse woody debris (m/ha)	330	140	2	530	220	2	na	80	
Non-native plant cover (%)	0	25	3	0	10	5	0	5	5
Maximum site-based score			80			75			25
Site-based BioCondition score (out of 10)			6			7.26666667			7

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	7			7			4		
Site	HQ4a			HQ4b			HQ5		
Regional ecosystem	11.3.27b			11.3.27b			11.3.4		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		0	0		100	5		67	3
Native plant species richness - trees (No.)	na	2		1	6	5	4	4	5
Native plant species richness - shrubs (No.)	na	0		1	1	5	2	2	5
Native plant species richness - grasses (No.)	1	4	5	3	4	5	7	6	2.5
Native plant species richness - forbs (No.)	9	4	2.5	6	6	5	10	2	0
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	na	0		16	17	5	22	16	5
Tree sub-canopy height (m)	na	0		10	0	0	12	0	0
Tree height - average						2.5			2.5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	na	0		40	75.7	5	17	29.3	5
Tree sub-canopy cover (%)	na	0		2	0	0	5	9.6	5
Tree cover - average						2.5			5
Native shrub canopy cover (%)	na	0		na	3		1	5	3
Native perennial grass cover (%)	6	85.2	5	3	2.6	3	43	6	1
Organic litter (%)	na	2.4		15	81.8	3	20	14	5
Large trees/ha - total	na			28	18	10	35	12	5
Coarse woody debris (m/ha)	na	160		530	250	2	384	200	5
Non-native plant cover (%)	0	5	5	0	5	5	0	70	0
Maximum site-based score			25			75			80
Site-based BioCondition score (out of 10)			7			7.06666667			5.25

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	2			4			14		
Site	HQ6			HQ7			HQ9		
Regional ecosystem	11.3.2			11.3.4			11.5.17		
Broad condition state	remnant			remnant			remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		0	0		50	3		100	5
Native plant species richness - trees (No.)	2	2	5	4	6	5	3	2	2.5
Native plant species richness - shrubs (No.)	2	6	5	2	4	5	1	0	0
Native plant species richness - grasses (No.)	9	2	0	7	3	2.5	3	4	5
Native plant species richness - forbs (No.)	17	4	0	10	2	0	7	4	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	18	15	5	22	18	5	18	15	5
Tree sub-canopy height (m)	na	0		12	0	0	8	0	0
Tree height - average			5			2.5			2.5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	40	30.9	5	17	42.3	3	41	9.5	2
Tree sub-canopy cover (%)	na	4.3		5	13.6	3	6	0	0
Tree cover - average			5			3			1
Native shrub canopy cover (%)	2	0	0	1	0	0	3	0.4	3
Native perennial grass cover (%)	35	4	1	43	13	1	20	16	3
Organic litter (%)	30	39	5	20	40	5	31	33	5
Large trees/ha - total	22	8	5	35	14	5	29	4	5
Coarse woody debris (m/ha)	307	90	2	384	140	2	330	140	2
Non-native plant cover (%)	0	75	0	0	75	0	0	15	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	4.125			4.25			5.1875		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	12			10			8		
Site	WE1			WE2			WE3		
Regional ecosystem	11.5.3			11.4.9			11.4.8		
Broad condition state	Remnant			regrowth			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		0	0
Native plant species richness - trees (No.)	6	4	2.5	5	0	0	3	2	2.5
Native plant species richness - shrubs (No.)	6	6	5	10	6	2.5	10	4	2.5
Native plant species richness - grasses (No.)	6	7	5	5	2	2.5	9	6	2.5
Native plant species richness - forbs (No.)	10	5	2.5	10	2	0	7	6	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	16	15.5	5	13	1.7	0	17	17	5
Tree sub-canopy height (m)	7	8	5	8	0	0	9	7	5
Tree height - average			5			0			5
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	20	16.9	5	25	6	2	40	50.3	5
Tree sub-canopy cover (%)	3	0	0	10	0	0	3	8.7	3
Tree cover - average			2.5			1			4
Native shrub canopy cover (%)	3	22.9	3	5	24.8	3	5	3.1	5
Native perennial grass cover (%)	19	8.6	1	20	0	0	20	8	1
Organic litter (%)	20	34	5	45	18	3	37	41	5
Large trees/ha - total	10	8	10	45	0	0	42	4	5
Coarse woody debris (m/ha)	314	40	2	1200	28	0	813	665	5
Non-native plant cover (%)	0	20	5	0	65	0	0	20	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	6.6875			2.125			5.625		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	15			18		
Site	WE4			WE5		
Regional ecosystem	11.5.3			11.4.8		
Broad condition state	regrowth			regrowth		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		108	5		100	5
Native plant species richness - trees (No.)	6	2	2.5	3	3	5
Native plant species richness - shrubs (No.)	6	8	5	10	4	2.5
Native plant species richness - grasses (No.)	6	2	2.5	9	3	2.5
Native plant species richness - forbs (No.)	10	3	2.5	7	3	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	16	5	3	17	2	0
Tree sub-canopy height (m)	7	0	0	9	0	0
Tree height - average			1.5			0
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	20	3.6	2	40	6.3	2
Tree sub-canopy cover (%)	3	0	0	3	0	0
Tree cover - average			1			1
Native shrub canopy cover (%)	3	25.8	3	5	2.1	3
Native perennial grass cover (%)	19	2	1	20	1	0
Organic litter (%)	20	20	5	37	34	5
Large trees/ha - total	10	0	0	42	0	0
Coarse woody debris (m/ha)	314	110	2	813	45	0
Non-native plant cover (%)	0	60	0	0	65	0
Maximum site-based score	80			80		
Site-based BioCondition score (out of 10)	3.875			3.3125		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score

Wynette North Study Area

Assessment Unit	16			17			15		
Site	WE6			WE7			WE8		
Regional ecosystem	11.5.9			11.4.8			11.5.3		
Broad condition state	isturbed othe			isturbed othe			regrowth		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		0	0		50	3		100	5
Native plant species richness - trees (No.)	3	3	5	3	1	2.5	6	2	2.5
Native plant species richness - shrubs (No.)	6	1	0	10	4	2.5	6	4	2.5
Native plant species richness - grasses (No.)	9	2	0	9	2	0	6	2	2.5
Native plant species richness - forbs (No.)	11	2	0	7	2	2.5	10	0	0
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	17	16	5	17	1.7	0	16	3.5	0
Tree sub-canopy height (m)	8	0	0	9	0	0	7	0	0
Tree height - average			2.5			0			0
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	25	7.4	2	40	0.9	0	20	7.9	2
Tree sub-canopy cover (%)	5	6.5	5	3	0	0	3	0	0
Tree cover - average			3.5			0			1
Native shrub canopy cover (%)	10	0	0	5	1.8	3	3	10.5	3
Native perennial grass cover (%)	26	1	0	20	3	1	19	2	1
Organic litter (%)	30	39	5	37	31	5	20	23	5
Large trees/ha - total	20	2	5	42	0	0	10	0	0
Coarse woody debris (m/ha)	342	50	2	813	100	2	314	0	0
Non-native plant cover (%)	0	60	0	0	75	0	0	75	0
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	2.875			2.6875			2.8125		

Assessment Unit (AU)
AU BioCondition Score
AU Area
AU Weighted BioCondition Score



Appendix C Fauna Species-based Attribute Scores



Species	Habitat attributes	Indicators	Score	Weighting	Weighted score
Greater Glider	Quality and availability of food and habitat required for foraging	Abundance of food trees / eucalypts (absent (0) to high (5)) x5	25	1	25
		Sub-total		1	25.00
	Quality and availability of habitat required for shelter and breeding	Abundance of large hollows (absent (0) to high (5)) x 5	20	1	20
		Sub-total		1	20.00
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation (completely fragmented (0) to highly connected (5)) x5	20	0.5	10
		Average patch size (<1ha (0), 1-5ha (8.3), 5-10ha (16.6), >10ha (25))	25	0.5	12.5
		Sub-total		1	22.50
	Threat Abundance	Historical clearing / fragmentation (abundant (0) to high (5)) x5	15.00	0.5	7.50
		Bushfire risk (high (0) to low (5)) x5	10	0.4	4
		Barbwire entanglement risk (abundant (0) to absent (5)) x5	10	0.1	2
		Sub-total		1	13.50
		Total (out of 10)			8.10
Koala	Quality and availability of food and habitat required for foraging	Abundance of koala food trees (absent (0) to high (5)) x5	25	1	25
		Sub-total	25	1	25.00
	Quality and availability of habitat required for shelter and breeding	Abundance of koala shelter trees / DBH>30cm (absent (0) to high (5)) x5	20	1	20
		Sub-total	25	1	20.00
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation (completely fragmented (0) to highly connected (5)) x5	15	1	15
		Sub-total		1	15
	Threat Abundance	Historical clearing / fragmentation (abundant (0) to absent (5)) x5	15	0.6	9
		Abundance of feral dogs (abundant (0) to absent (5)) x5	5	0.2	1
		Vehicle strike risk (high (0) to absent (5)) x5	20	0.2	4
		Sub-total		1	14
		Total (out of 10)			7.40

Species	Habitat attributes	Indicators	Score	Weighting	Weighted score
Ornamental snake	Quality and availability of food and habitat required for foraging	Abundance of amphibians (low (0) to high (5)) x5	15	0.67	10.05
		Presence of water (absent (0), ephemeral (12.50), permanent (25))	12.5	0.33	4.125
		Sub-total		1	14.18
	Quality and availability of habitat required for shelter and breeding	Soil crack abundance (absent (0) to high (5)) x5	15	0.3	4.5
		Soil crack depth (absent (0) to deep (5)) x5	20	0.3	6
		Abundance of woody debris (absent (0) to high (5)) x5	5	0.3	1.5
		Litter abundance (absent (0) to high (5)) x5	10	0.1	1
		Sub-total		1	13
	Quality and availability of habitat required for mobility	Average patch size (<1ha (0), 1-5ha (8.3), 5-10ha (16.6), >10ha (25))	20	1	20
		Sub-total		1	20.00
	Threat Abundance	Historical clearing (abundant (0) to absent (5)) x5	5	0.4	2
		Cane Toad Abundance (high (0) to absent (5)) x5	5	0.2	1
		Habitat degradation/ cattle tramping (high (0) to absent (5)) x5	5	0.4	2
		Sub-total		1	5
		Total (out of 10)			5.22
Squatter Pigeon	Quality and availability of food and habitat required for foraging	Vegetation Condition (non-remnant (0), regrowth (8.3), mature regrowth (16.6), remnant (25))	25	1	25
		Sub-total		1	25.00
	Quality and availability of habitat required for shelter and breeding	Average distance to water (>3km (0), 1-3km (12.5), <1km (25))	12.5	1	12.5
		Sub-total		1	12.5
	Quality and availability of habitat required for mobility	N/A	N/A		#VALUE!
		Sub-total		0	#VALUE!
	Threat Abundance	Historical clearing (Abundant (0) to Absent (5)) x5	15	0.5	7.5
		Cattle abundance (Abundant (0) to absent (5)) x5	10	0.25	2.5
		Abundance of pests (feral dogs / cats) (abundant (0) to absent (5)) x5	10	0.25	2.5
		Sub-total		1	12.5
		Total (out of 10)			6.67

APPENDIX C. ELLENSFIELD BASELINE OFFSET ASSESSMENT REPORT



Ellensfield Baseline Offset Assessment Report

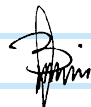


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Appendices

Appendix A	Ellensfield Study Area Database Search Results
Appendix B	Ellensfield Study Area Site based Attribute Scores
Appendix C	Ellensfield Study Area Fauna Species-based Attribute Scores



Definitions

Term	Definition
Broad Vegetation Group	A higher-level grouping of vegetation communities that describe major ecological patterns and relationships across Queensland (Neldner <i>et al.</i> , 2020).
Ellensfield Investigation Area	The area of the Ellensfield Property surveyed for target MNES and MSES values.
Ellensfield Property	Property located 25 km northeast of Moranbah on Lot 13 on Plan SP178466.
Ellensfield Study Area	A subset area of the Ellensfield Investigation Area relevant to this report.
Habitat Quality Score	A method of evaluating habitat quality within a particular community based on key indicators including site condition, site context and species habitat index (if necessary). The method produces a score out of 10, where the maximum score of 10 represents a fully intact system.
Matters of National Environmental Significance	Environmental values protected under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> . Significant impacts to these values may require offsets under the legislation.
Matters of State Environmental Significance	State interests defined under Part F of the Queensland State Planning Policy and include ecological features such as Regulated Vegetation, wetlands, fish habitat areas and threatened species habitat.
Non-remnant vegetation	All vegetation that is not mapped as remnant vegetation. May include regrowth, heavily thinned or logged and significantly disturbed vegetation that fails to meet the structural and/ or floristic characteristics of remnant vegetation. It also includes urban and cropping land (Neldner <i>et al.</i> , 2020).
Regional Ecosystem	A vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil (Neldner <i>et al.</i> , 2020). Regional Ecosystems are described in the Regional Ecosystem Description Database, produced by the Queensland Herbarium.
Regrowth Vegetation	Is non-remnant vegetation that has a significant woody component but fails to meet the structural and/or floristic characteristics of remnant vegetation. Includes vegetation that has regrown after clearing or been heavily thinned or logged (Neldner <i>et al.</i> , 2020).
Regulated Vegetation	Vegetation that is mapped within the regulated vegetation management map produced by Department of Resources (formerly Department of Natural Resources, Mines and Energy). The Queensland <i>Vegetation Management Act 1999</i> is applicable to regulated vegetation.
Remnant vegetation	A regional ecosystem that has not undergone recent clearing. It is defined under the Queensland <i>Vegetation Management Act 1999</i> as: (b) forming the predominant canopy of the vegetation— (i) covering more than 50% of the undisturbed predominant canopy; and (ii) averaging more than 70% of the vegetation's undisturbed height; and (iii) composed of species characteristic of the vegetation's undisturbed predominant canopy.



Term	Definition
Suitable habitat	A species preferred environment required to sustain a viable population. Suitable habitat may include breeding, foraging and shelter resources for fauna or preferred environmental conditions of flora.
Threatened Ecological Community	An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. Threatened ecological communities are listed under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
Threatened species	A threatened species is any plant or animal species that is at risk of extinction. Species listed as extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) or conservation dependent (CD) under the Commonwealth <i>Environmental Protection and Biodiversity Conservation Act 1999</i> or extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) under the Queensland <i>Nature Conservation Act 1992</i> .
Vegetation community	An area of vegetation which is relatively uniform with respect to structure and floristic composition (Neldner <i>et al.</i> , 2020).



Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia database (Queensland)
API	Aerial Photographic Interpretation
AU	Assessment Unit
BoM	Bureau of Meteorology
BVG	Broad Vegetation Group
DAWE	Commonwealth Government Department of Agriculture, Water and the Environment (now Department of Climate Change, Energy, Environment and Water)
DES	Queensland Department of Environment and Science
DNRME	Queensland Department of Natural Resources, Mines and Energy (now Department of Resources)
DoR	Queensland Department of Resources
DotE	Former Commonwealth Department of the Environment (now DAWE)
DSEWPac	Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now Department of Agriculture, Water and the Environment)
E	Endangered
E2M	E2M Pty Ltd
EO Act	Queensland <i>Environmental Offsets Act 2014</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
GPS	Global Positioning System
ha	Hectare
LC	Least Concern
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC	No Concern at Present
NC Act	Queensland <i>Nature Conservation Act 1992</i>
OC	Of Concern
RE	Regional Ecosystem
SO	Stream Order
sp.	Singular species. For example, <i>Eucalyptus</i> sp. refers to a single species of <i>Eucalyptus</i>



Abbreviation	Description
spp.	Multiple species. For example, <i>Eucalyptus</i> spp. refers to multiple species of <i>Eucalyptus</i>
SEVT	Semi Evergreen Vine Thicket
TEC	Threatened Ecological Community
VM Act	Queensland <i>Vegetation Management Act 1999</i>
Whitehaven	Whitehaven WS Pty Ltd (proponent) of the Winchester South Project
WoNS	Weed of National Significance



Executive Summary

E2M Pty Ltd (E2M) was engaged by Whitehaven WS Pty Ltd (Whitehaven) to conduct an ecological survey within a portion of the Ellensfield property (herein referred to as the Ellensfield Investigation Area) located on Lot 13 on Plan SP178466.

The purpose of the ecological survey is to identify and evaluate the following target Matters of State Environmental Significance (MSES) protected under the Queensland *Environmental Offsets Regulation 2014* and Matters of National Environmental Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*:

- two threatened ecological communities (TECs):
 - Natural grassland of the Queensland Central Highlands and Northern Fitzroy Basin (referred to as Natural Grassland TEC); and
 - Poplar Box Grassy Woodland on Alluvial Plains (referred to as Poplar Box TEC)
- habitat and species records for five threatened species:
 - koala (combined populations of Queensland, New South Wales, and the Australian Capital Territory) (*Phascolarctos cinereus*)
 - greater glider (*Petauroides volans*)
 - squatter pigeon (*Geophaps scripta scripta*)
 - ornamental snake (*Denisonia maculata*); and
 - *Solanum adenophorum*
- regulated vegetation (including 'endangered' and 'of concern' regional ecosystems (REs), watercourse REs and connectivity).

A field survey of the Ellensfield Investigation Area between the 10th and 17th May 2021 confirmed the occurrence of:

- koala
- greater glider
- squatter pigeon; and
- regulated vegetation (including 'endangered' RE (RE 11.9.5), 'of concern' REs (RE 11.3.4 and 11.10.8), watercourse REs (RE 11.3.4, 11.3.25, 11.9.9, 11.10.4a and 11.10.7) and connectivity).

The field surveys successfully identified target MNES and MSES species across the Ellensfield Study Area. Table ES-1 below outlines the relevant MNES / MSES identified, and the quantity of habitat present within the Ellensfield Study Area.



Table ES-1: Summary of findings for all relevant MNES and MSES

Environmental Matter	Relevant RE(s)	Broad condition class	Area available within the Ellensfield Study Area (ha)
MNES known to occur			
koala (<i>Phascolarctos cinereus</i>)	11.3.4, 11.3.25, 11.9.9, 11.10.4a and 11.10.7	remnant	1,328.42
greater glider (<i>Petauroides volans</i>)	11.3.4 and 11.3.25	remnant	88.66
squatter pigeon (<i>Geophaps scripta scripta</i>)	11.3.4, 11.3.25, 11.9.5, 11.9.9, 11.10.4a and 11.10.7	remnant and high value regrowth	1,324.68 (dispersal habitat)
MSES known to occur (including the MNES above)			
Endangered RE	11.9.5 (BVG 25a)	high value regrowth	6.51
Of Concern REs	11.3.4 (BVG 16c)	remnant	47.43
	11.10.8 (BVG 7a)	remnant	8.21
Watercourse REs	11.3.4 (BVG 16c)	remnant	9.61
	11.3.25 (BVG 16a)	remnant	35.37
	11.9.9 (BVG 13c)	remnant	0.12
	11.10.7 (BVG 12a)	remnant	38.08
	11.10.7/11.10.4a (BVG 12a/12a)	remnant	51.05

BVG = Broad Vegetation Group



1 Introduction

1.1 Background

E2M Pty Ltd (E2M) was engaged by Whitehaven WS Pty Ltd (Whitehaven) to conduct ecological surveys within the Ellensfield Investigation Area (Lot 13 on Plan SP178466) (Figure 1 and Figure 2).

1.2 Scope and Objectives

The objective of the ecological survey is to evaluate the suitability of the environment within the Ellensfield Investigation Area to support a series of target protected matters. The target protected matters include:

- two threatened ecological communities (TECs) listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):
 - Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin (referred to as Natural Grassland TEC); and
 - Poplar Box Grassy Woodland on Alluvial Plains (referred to as Poplar Box TEC)
- habitat for five threatened species (listed under the EPBC Act and/or the Queensland *Nature Conservation Act 1992* [NC Act]):
 - *Solanum adenophorum* (listed as Endangered under the NC Act)
 - koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) (Endangered under the EPBC Act¹). Note that the koala has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral
 - greater glider (southern and central) (*Petauroides volans*) (Endangered under the EPBC Act^{1,2}). Note that the greater glider has subsequently been reclassified as endangered but was still listed as vulnerable at the time of the Winchester South referral
 - squatter pigeon (southern subspecies) (*Geophaps scripta scripta*) (listed as Vulnerable under both the EPBC Act and NC Act); and
 - ornamental snake (*Denisonia maculata*) (listed as Vulnerable under both the EPBC Act and NC Act)
- regulated vegetation
 - ‘endangered’ and ‘of concern’ Regional Ecosystems (REs) listed under the NC Act
 - REs within the defined distance of the defining banks of a watercourse (as defined by the Queensland *Environmental Offsets Regulation 2014*) (here in referred to as watercourse REs); and
 - connectivity.

The scope of the of the survey involved:

- a desktop review of available vegetation mapping and environmental database records

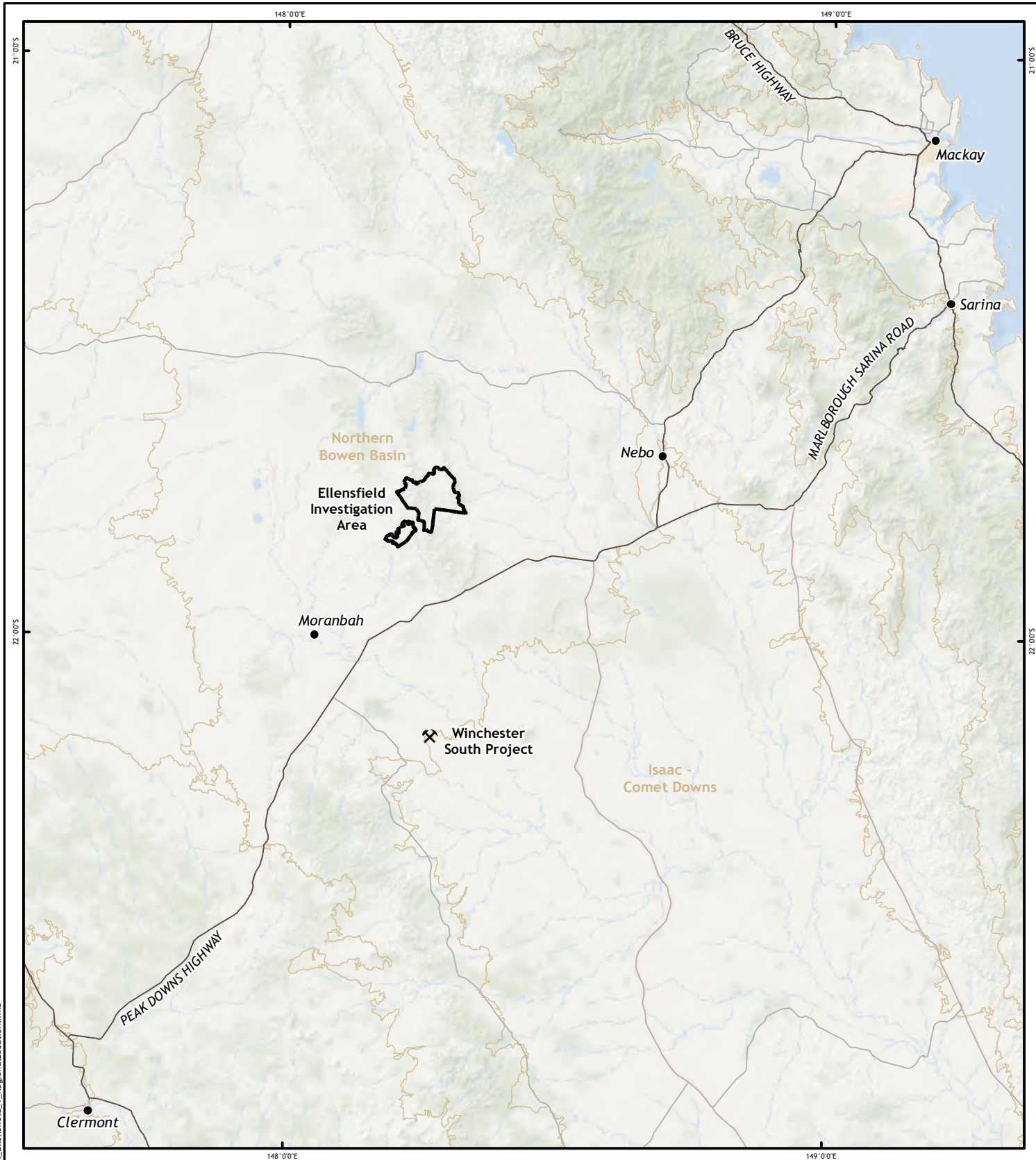
¹ Listed as ‘Vulnerable’ under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as ‘Vulnerable’ not ‘Endangered’ (refer section 158A of the EPBC Act).

² Listed as ‘Vulnerable’ under the EPBC Act at the time of the controlled action decision (17 & 18 July 2019) and therefore assessed as ‘Vulnerable’ not ‘Endangered’ (refer section 158A of the EPBC Act).



- habitat assessments and targeted surveys for koala, greater glider, squatter pigeon (southern subspecies), ornamental snake and *Solanum adenophorum*
- ground-truthing the extent and condition of the mapped REs
- BioCondition surveys to supply input data for the Habitat Quality assessments in accordance with the Queensland Department of Environment and Science (DES) *Guide to determining terrestrial habitat quality* (2020a); and
- evaluation of the ecological features and processes that are essential to the maintenance and conservation of local ecosystem functioning (e.g. habitat connectivity, watercourses, threats).



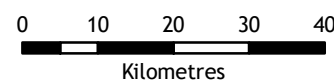


Legend

- Town
- ✂ Winchester South Project
- Watercourse
- Major Road
- ▭ Ellensfield Investigation Area
- ▭ Bioregion (IBRA v7)
- ▭ Biogeographic Subregions



Scale 1:1,000,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Roads: © DNRME 2019
IBRA v7: © DNRME 2020
Coal Resource Site: © DNRME 2020

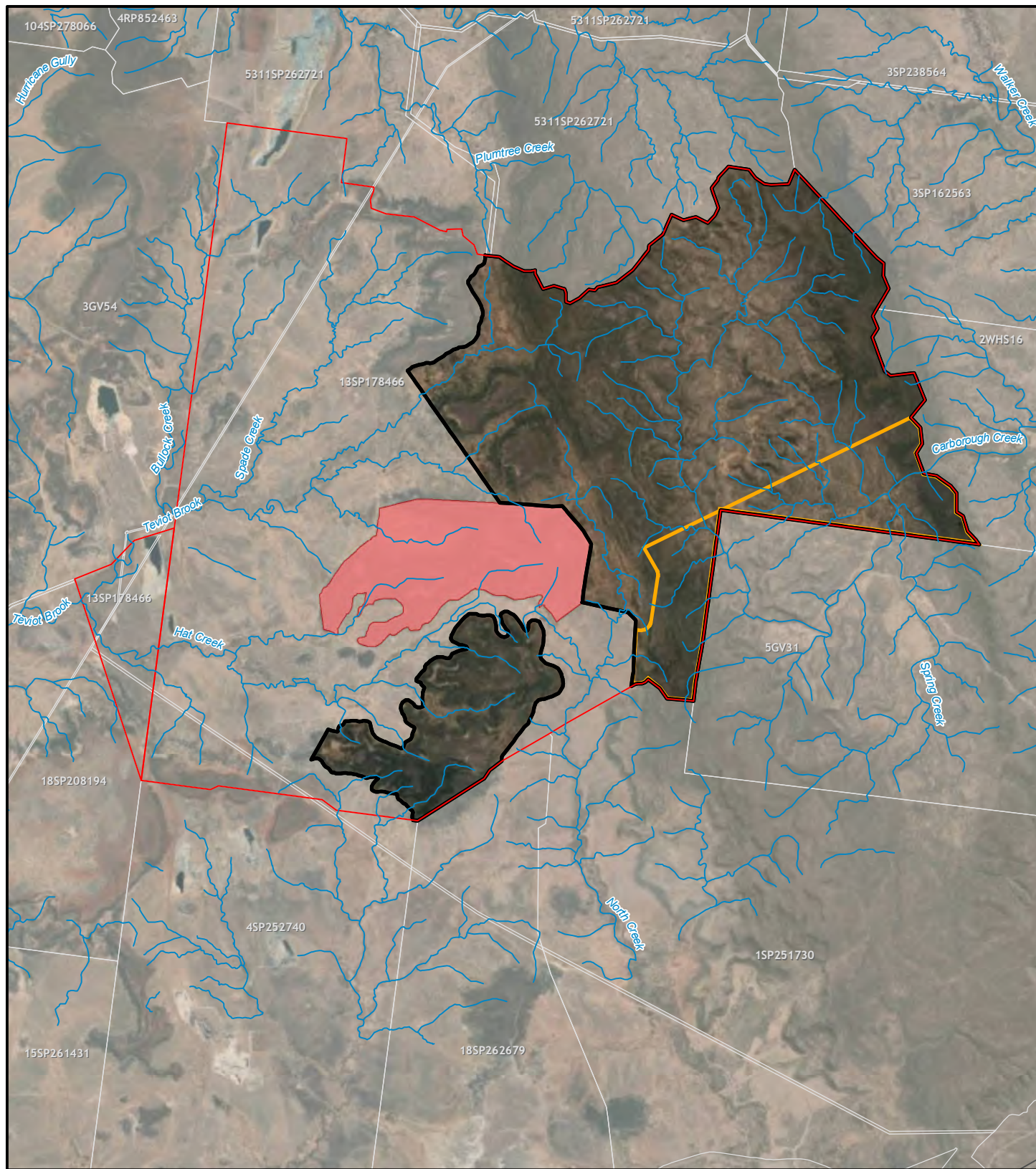
5	Issued for Use	CD	CO	05/07/2022
4	Issued for Use	DL	BD	24/03/2022
Rev	Description	Drawn	Approved	Date



FIGURE 1: REGIONAL LOCATION OF ELLENSFIELD AREA

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

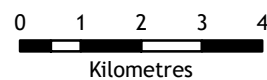


Legend

- Town
- Watercourse
- Major Road
- Cadastre
- Ellensfield Property Boundary
- Ellensfield Investigation Area
- Ellensfield Study Area
- Regulated Vegetation Management Map
- Category A Area



Scale 1:125,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
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Rev	Description	Drawn	Approved	Date



FIGURE 2: ELLENSFIELD INVESTIGATION AREA

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

2 Methods

The terrestrial ecological values of the Ellensfield Investigation Area were evaluated through a desktop assessment and a series of field surveys conducted in accordance with the recommended guidelines prescribed by the Queensland and/or Commonwealth governments. The following section details the methods employed to conduct both the desktop and the field assessments.

2.1 Desktop Assessment

The desktop assessment consolidated information from relevant databases, mapping, aerial imagery and published literature to produce an initial characterisation of the ecological values of the Ellensfield Investigation Area and the surrounding landscape. In part, this initial characterisation guides the assessment strategy employed in the field survey by highlighting information such as historic target species records, potential habitat features and mapped vegetation communities.

The desktop assessment collected information for the Ellensfield Study Area from the following sources:

- Commonwealth Department of Agriculture, Water and Environment (DAWE) Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) Database (Department of Agriculture, Water and the Environment [DAWE], 2021a)
- Commonwealth DAWE Species Profile and Threats (SPRAT) Database (DAWE, 2021b)
- Queensland DES Matters of State Environmental Significance (MSES) Environmental Reports (DES, 2021a)
- DES Wildlife Online and WildNet databases for species listed under the NC Act (DES, 2021d)
- DES Queensland Statewide Biodiversity Corridors mapping (DES, 2021c)
- Queensland Department of Resources (DoR) Regulated Vegetation Management Map (including Essential habitat) (DoR, 2020b)
- Atlas of Living Australia (ALA) (ALA, 2021)
- GeoScience Australia 1:100,000 drainage network of Qld (Geoscience Australia, 2021)
- Department of Natural Resources, Mines and Energy (DNRME) (now DoR) Detailed Surface Geology descriptions to confirm DES Land zone definitions (DoR, 2020a); and
- historical and latest available aerial photography (DoR, 2021).

Where required for desktop databases searches, a search radius of 20 km was applied from the approximate centre point of the Ellensfield Investigation Area (-21.77830; 148.30388).

Preliminary vegetation mapping was also undertaken across the Ellensfield Study Area through Aerial Photographic Interpretation (API). Based on the preliminary mapping, suitable representative survey sites were identified for each vegetation community to inform the field survey. This process also identified key areas to target during the field surveys in order to verify the correct RE classification as well as to undertake Habitat Quality Assessments. Consideration was also given to the likelihood of TEC presence.



2.2 Field Assessment

A field survey was conducted by four E2M ecologists between 10 to 17 May 2021 to identify and characterise the presence, extent and condition of contemporary ecological values within the Ellensfield Investigation Area. While field surveys were undertaken to identify and map target MNES and MSES listed in Section 1.2, additional environmental values were opportunistically recorded. The methods employed adhere to the guidelines and methodologies prescribed or supported by the Queensland and Commonwealth governments.

2.2.1 Vegetation Communities

2.2.1.1 Regional Ecosystems

Ground-truthing and validating RE mapping, including selection of suitable survey sites within the Ellensfield Investigation Area, was conducted in accordance with the Queensland Government's *Methodology for Surveying and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner et al., 2020). Using this methodology, quaternary vegetation surveys were carried out in alignment with the Queensland Herbarium's CORVEG database to classify REs occurring within the Ellensfield Investigation Area. Survey sites are depicted in Figure 3.

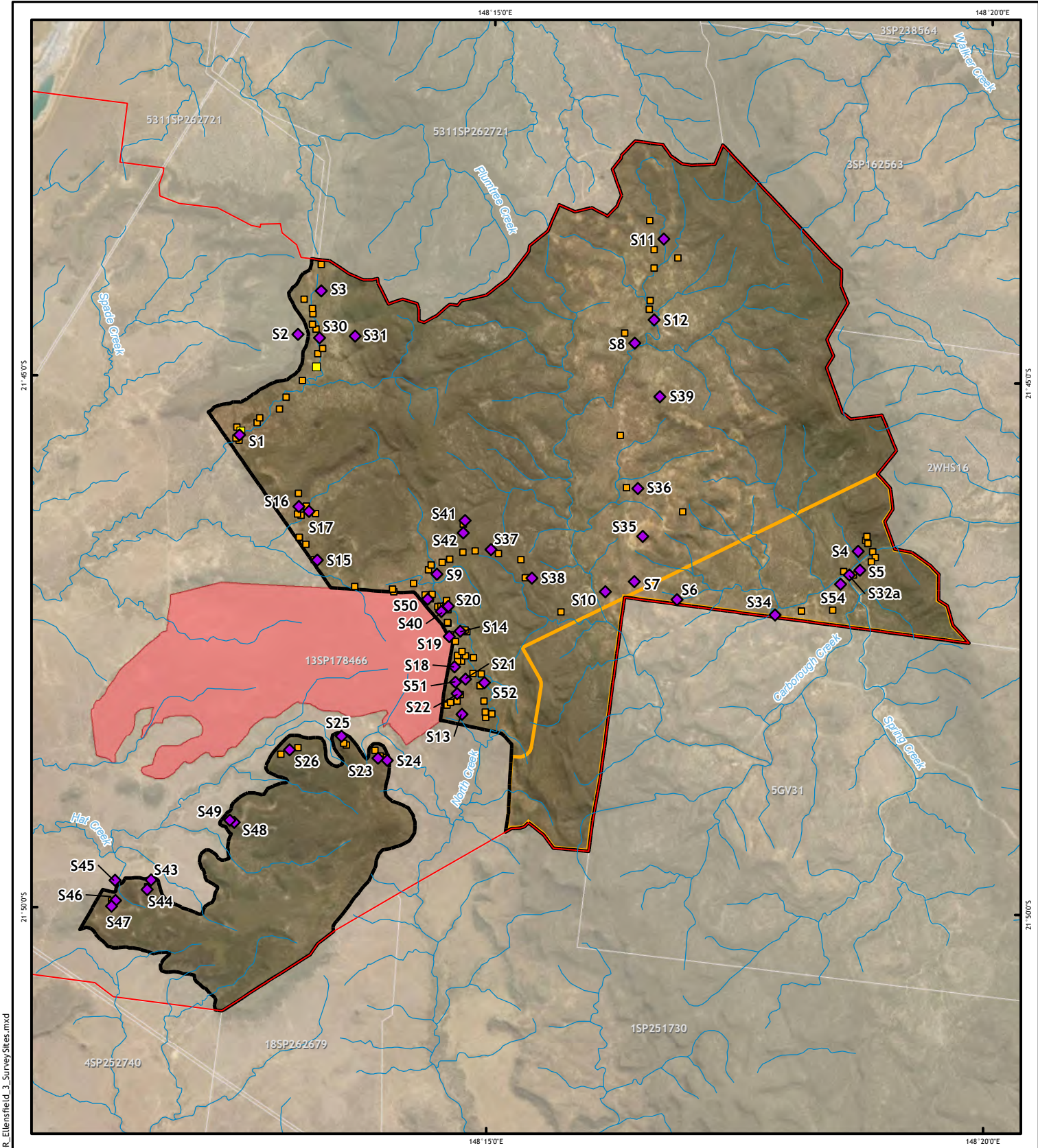
Ground-truthed vegetation was characterised as:

- Remnant vegetation - communities that conform with the definition under the *Vegetation Management Act 1999 (Qld)* (VM Act) and referenced by Neldner *et al.* (2020). Specifically, this comprises 'vegetation, part of which forms the predominant canopy of the vegetation:
 - covering more than 50% of the undisturbed predominant canopy
 - averaging more than 70% of the vegetation's undisturbed height; and
 - composed of species characteristic of the vegetation's undisturbed predominant canopy.
- Non-remnant vegetation - all vegetation that is not mapped as remnant vegetation. This includes regrowth and communities that have been historically cleared/disturbed or heavily modified (i.e. improved pastures, weed encroachment etc) that failed to meet the structural and/or floristic characteristics of remnant vegetation.

Information provided in the RE Technical Descriptions for the Brigalow Belt (DES, 2018) and structural formations of vegetation as defined by Specht (1970) served as a baseline for the undisturbed canopy, height and species with which to compare the field data and ascertain vegetation class.

Heterogeneous RE polygons mapped in the Ellensfield Investigation Area by DNRME (DoR, 2020b) were ground-truthed and mapped as homogeneous polygons with the exception of one heterogeneous polygon (RE 11.10.7/11.10.4a) (Section 3.2.2.1). Areas which had unsafe/poor access were interpreted using a combination of field assessment (where possible) and analysis of aerial imagery.



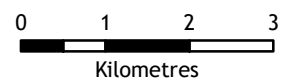


Legend

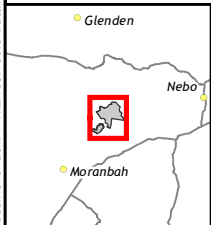
- ◆ Biocondition Site
- TEC Assessment Site
- Quaternary Survey Site
- Watercourse
- Cadastre
- Ellensfield Property Boundary
- Ellensfield Investigation Area
- Ellensfield Study Area
- Regulated Vegetation Management Map Category A Area



Scale 1:90,000 (A4)



Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastre: © DOR 2021
Watercourse: © Geoscience Australia

5	Issued for Use	CD	CO	05/07/2022
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Rev	Description	Drawn	Approved	Date



FIGURE 3: SURVEY SITES WITHIN THE ELLENSFIELD INVESTIGATION AREA

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

2.2.1.2 Threatened Ecological Communities

In conjunction with Quaternary vegetation assessments, Threatened Ecological Community (TEC) assessments were undertaken in the field within relevant vegetation communities to verify if key diagnostic characteristics and condition thresholds outlined in the Approved Conservation Advice (Department of the Environment [DotE], 2013) for EPBC Act listed TECs were met. Consideration of preliminary vegetation mapping was undertaken across the Ellensfield Study Area and indicated that TECs were unlikely to be present.

2.2.2 Habitat Quality Assessments

Habitat quality is assessed using a combination of indicators that measure the overall viability of the Ellensfield Investigation Area and its capacity to support the relevant MNES/MSES. Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.3* (DES, 2020a) (herein referred to as the 'Habitat Quality Guide') which involved the collection and analysis of:

- landscape-scale attribute data
- site-based attribute data; and
- species habitat attribute data.

2.2.2.1 Landscape-scale Attributes

An assessment of landscape-scale attributes is required to determine if the Ellensfield Investigation Area is situated in a landscape that can achieve a conservation outcome (i.e. suitably connected and contains large tracts of vegetation). In accordance with the Habitat Quality Guide, the Ellensfield Investigation Area was assessed against the criteria summarised in Table 1.

Table 1. Landscape-scale Attributes Assessment Criteria

Attribute	Description	Assessment extent	Maximum score
Size of patch	The size of the patch assessed and associated directly connecting remnant vegetation	NA	10
Connectedness	The proportion of the site's boundary that is connected to remnant vegetation	NA	5
Context	The percentage of remnant and regrowth vegetation within a 1 km buffer of the site	1 km buffer	5
Ecological Corridors	Proximity and location to DES mapped Statewide Biodiversity Corridors (fragmented landscapes only)	Corridor type (Bioregional, regional or subregional); and location (within, outside, shares boundary)	NA

2.2.2.2 Site-based Attributes

Site-based attribute data was collected within 100 m x 50 m areas (including various sub-plots) for each assessment unit (AU), weighted in accordance with the Habitat Quality Guide and compared to BioCondition benchmark values for the relevant RE benchmark (Queensland Herbarium, 2021). A summary of the site-based attribute data (herein referred to as the BioCondition data), plot area and associated maximum score is summarised in Table 2.



A Trimble TDC600 Global Positioning System (GPS) device was used to record the location of mid-point (50 m mark) of each BioCondition Assessment survey site. The location of BioCondition Assessment survey sites recorded in the Ellensfield Investigation Area are depicted in Figure 3.

Table 2. BioCondition Assessment Criteria

Attribute	Description	Assessment plot	Maximum score
Large trees	Number of large trees per hectare, as determined by existing BioCondition benchmarks for the associated RE	100 m x 50 m	15 [†]
Tree canopy height	Median canopy height in metres of the ecologically dominant layer	100 m x 50 m	5 [†]
Recruitment (%)	The proportion of overstorey species present at a site that are regenerating (<5 cm diameter at breast height [DBH])	100 m x 50 m	5 [†]
Tree canopy cover (%)	Vertical projection of the tree canopy crown cover along a transect	100 m transect	5 [†]
Shrub layer cover (%)	Vertical projection of the shrub layer cover of native shrubs	100 m transect	5 [†]
Coarse woody debris	The length of fallen woody logs and other coarse woody debris (>10 cm diameter and >0.5 m in length) per hectare	50 m x 20 m	5 [†]
Native plant species richness	Native plant species richness, comprising all life forms (i.e. trees, shrubs, grasses and forbs/other)	100 m x 50 m (trees) 50 m x 10 m (shrubs, grasses, forbs/other)	5 each (20 total)
Non-native plant cover (%)	Percentage cover of non-native/weed plant species	50 m x 10 m	10
Native perennial grass cover (%)	Average percentage cover of native perennial grass species	Five 1 m x 1 m	5
Organic litter cover	The average percentage cover of organic material such as fallen leaves, twigs, and branches <10 cm diameter	Five 1 m x 1 m	5

[†] Denotes site-based attributes which do not apply to grasslands RE's.

2.2.2.3 Fauna Species-based Attributes

Habitat assessments were undertaken during field surveys to provide further information regarding habitat suitability for targeted threatened fauna species (Section 1.2). Habitat assessments, of the most part, included evaluation of key indicators specific to each target threatened fauna species. Habitat assessments, for the most part, were undertaken in conjunction with BioCondition sites (Figure 3). Key habitat indicators include, but were not limited to:

- abundance of prey species (e.g. frogs)
- proximity to water and availability (permanent/ephemeral)
- gilgai depth, soil crack depth and abundance, presence of amphibians
- habitat patch size and vegetation type (remnant, regrowth, etc.)
- foraging resources
- tree and log hollow abundance and size (per ha)
- percent (%) composition and cover (%) of koala food tree species



- habitat connectivity
- presence and abundance of potential threats (i.e. cattle grazing, invasive species, habitat degradation)
- abundance of woody debris
- rocky outcrop presence/abundance
- leaf litter abundance; and
- type / level of disturbance.

Each key habitat indicator was scored on a scale from 0 (absent/low) to 25 (very high) for each AU and used to calculate a weighted score. A total species habitat score (out of 10) was then calculated for each target threatened fauna species (Section 3.4.3).

2.2.3 Threatened Species Surveys

Target threatened flora and fauna species were surveyed in accordance with the methods described within the relevant prescribed survey guidelines including:

- *EPBC Act Referral Guidelines for the Vulnerable Koala* (DotE, 2014)
- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Queensland Herbarium, 2018)
- *EPBC Act Draft Referral Guidelines for the Nationally-listed Brigalow Belt Reptiles* (Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC], 2011a)
- *Survey Guidelines for Australia's Threatened Reptiles* (DSEWPaC, 2011c)
- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts [DEWHA], 2010)
- *Survey Guidelines for Australia's Threatened Mammals* (DSEWPaC, 2011b); and
- the random meander technique (Cropper, 1993).

2.2.3.1 Targeted Threatened Fauna and Flora Surveys

Targeted threatened fauna and flora surveys were undertaken in areas within the Ellensfield Study Area likely to support suitable habitat for target MNES and MSES species (Section 1.2 and Section 2.2.2.3). Based on the outcomes of the desktop assessment, target threatened flora and fauna determined to potentially occur within the Ellensfield Investigation Area were:

- *Solanum adenophorum*
- koala (*Phascolarctos cinereus*)
- greater glider (*Petauroides volans*)
- squatter pigeon (southern subspecies) (*Geophaps scripta scripta*); and
- ornamental snake (*Denisonia maculata*).

The relevant target species survey methods employed during the field survey include:

- active, diurnal searches for *Solanum adenophorum* and koala presence (i.e. scratches and scat)
- waterbody watches (e.g. dams, troughs etc) targeting squatter pigeon
- nocturnal, spotlighting transects targeting ornamental snake, greater glider, and koala - these surveys were conducted on foot using a hand-held and/or head torch to detect eye shine and investigate microhabitats (e.g. decorticating bark or coarse woody debris) within each habitat type



- slow vehicle drive spotlighting was also undertaken to target all fauna species; and
- opportunistic observations.

Targeted threatened fauna surveys conducted within the Ellensfield Investigation Area aimed to meet the prescribed survey effort guidelines for the targeted threatened fauna species; however, in some cases, achieving the recommended survey effort in the guidelines was not necessary or practical, particularly where effort was measured by survey hours per potential habitat area, or where the target species had already been verified. While the recommended survey effort in the guidelines was not always achieved, the survey effort undertaken is considered to be sufficient for the purposes of a baseline assessment to inform possible environmental offset options. Where possible, the targeted survey effort for a particular species was supplemented by habitat assessments (refer to Section 2.2.2.3).



3 Ellensfield Investigation Area

The Ellensfield Investigation Area is situated within the Ellensfield property located approximately 22 km northeast of the township of Moranbah (Figure 1). The 19,496 ha property is characterised by flat to undulating terrain punctuated by iron stone jump ups. Much of the western half of the property is cleared of native vegetation and managed for livestock grazing; whereas the eastern half of the property remains largely vegetated. Notable watercourses intersecting the property include North Creek (in the south, running from north to south), and Carborough Creek (in the east) running from north to south then east (Figure 2). Several dams, watering points and boundary fences occur throughout the property.

The Ellensfield Investigation Area is a subset 8,855.6 ha of the Ellensfield property situated in the eastern half of the property and composed of two discrete areas. The Ellensfield Investigation Area features rocky jump ups, remnant woodlands and low-lying riparian. There are localised pockets of clearing and infrastructure (i.e. dams, water tanks, troughs, fences) to support livestock as well as past selective thinning along the drainage lines however, most the Ellensfield Investigation Area consists of remnant vegetation.

The Ellensfield Study Area is a further subset of the Ellensfield Investigation Area that covers approximately 1,341 ha and encompasses the ground-truthed environmental values required to support the target protected matters required to acquit Whitehaven's project obligations (Figure 2).

The following sections report the outcomes of the desktop assessments and field surveys undertaken for the Ellensfield Investigation Area with a focus on the Ellensfield Study Area.

3.1 Desktop Assessment Results

The desktop assessment determined the following target MNES and MSES as potentially occurring in a search area covering the Ellensfield property (including the Ellensfield Study Area):

- MNES identified under the EPBC Act, including:
 - Natural Grassland TEC
 - Poplar Box TEC
 - koala
 - greater glider
 - squatter pigeon (southern subspecies); and
 - ornamental snake
- MSES including (DES, 2021a):
 - *Solanum adenophorum*
 - Regulated Vegetation, comprising
 - 'Endangered' prescribed RE 11.9.5
 - 'Of Concern' prescribed REs 11.3.4 and 11.10.8
 - Watercourse RE (i.e. remnant vegetation intersecting a watercourse); and
 - essential habitat for ornamental snake (*Denisonia maculata*).

Results from the desktop assessment are provided in Appendix A.



3.2 Field Survey Results

3.2.1 Survey Conditions

A field survey of the Ellensfield Investigation Area (including the Ellensfield Study Area) was completed between 10 - 17 May 2021. Weather conditions at the time of the field survey were dry and warm, with a daily maximum temperature range of 24.4°C to 33.2°C³ and a daily minimum temperature range of 7.6°C to 18.5°C. The Moranbah area had received an average amount of rainfall (approximately 25 mm) in the month preceding the survey, but only received about half of the average rainfall during the three months preceding the survey (approximately 111 mm (as compared to a cumulative 206 mm over February, March and April). At the time of the field survey, standing water was observed within ephemeral drainage features and watercourses. No rainfall was received on the Ellensfield property during the field survey.

3.2.2 Vegetation Communities

3.2.2.1 Regional Ecosystems

Ground-truthed regional ecosystems (GTREs) within the Ellensfield Study Area are listed in Table 3 and shown on Figure 4. The extent of GTREs are generally consistent with those mapped by DNRME.

Two vegetation communities within the Ellensfield Study Area were assessed and mapped as mixed polygons:

- RE 11.10.7/11.10.4a; and
- RE 11.10.8/11.10.4a/11.10.7.

RE 11.10.7 and RE 11.10.4a are both characterised by eucalypt woodland on coarse-grained sedimentary rock. Both REs are a part of the same Broad Vegetation Group (BVG) (BVG 12a) and provide the same habitat value for the target MNES/MSES. Narrow-leaved ironbark (*E. crebra*) is the dominant canopy species within RE 11.10.7 and RE 11.10.4a making the delineation between the two indistinguishable via Aerial Photographic Interpretation where they appear (where they co-occur) as one homogenous community. The mixed polygon within the Ellensfield Study Area is approximately 666.62 ha. The GTRE field data indicate that, of the area able to be surveyed, the pockets of RE 11.10.4a scattered throughout the RE 11.10.7 woodland occurred in proportions consistent with DoR mapping (80% [11.10.7]/ 20% [11.10.4a]). The ratios were used to calculate the approximate area of each RE; however, the two communities are mapped as a mixed polygon on Figure 4.

The second vegetation community mapped as a mixed polygon within the Ellensfield Study Area is a 10.26 ha area of RE 11.10.8/11.10.4a/11.10.7. This polygon is predominately (i.e. 80%) semi-evergreen vine thicket (SEVT) on medium to coarse grained sedimentary rocks (DoR, 2020b) with some (20%) eucalypt woodland. The SEVT community (RE 11.10.8) is listed as 'of concern' but is not included as one of the 10 REs that comprise the SEVT of the Brigalow Belt (North and South) and Nandewar Bioregions Threatened Ecological Community (TEC). The 11.10.8/11.10.4a/11.10.7 mixed polygon was not ground-truthed during the field survey as access was limited and the community does not support the target protected matters required to acquit Whitehaven's project obligations.

³ Weather data recorded at Moranbah Airport (weather station number 034035), 30 km south-west of the Ellensfield Study Area (Bureau of Meteorology, 2021).



Table 3. Ground-truthed Regional Ecosystems within the Ellensfield Study Area

RE	BVG	VM Act ¹	Biodiversity Status ²	Vegetation Description	Total Remnant (ha)
11.3.4	16c	OC	OC	<i>Eucalyptus tereticornis</i> and <i>Corymbia clarksoniana</i> open woodland (18 m) on Quaternary alluvial soils. Other canopy species included <i>C. tessellaris</i> and <i>E. populnea</i> . Sparse shrub layer was present: <i>Grewia retusifolia</i> , <i>Acacia salicina</i> , <i>Cassia brewsteri</i> . The understorey was dominated by exotic and native grasses: <i>C. ciliaris</i> *, <i>H. contortus</i> and <i>Aristida</i> spp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Lantana camara</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 1).	47.43
11.3.25	16a	LC	OC	Mixed eucalypt fringing riparian woodland (20 m) comprising <i>E. camaldulensis</i> , <i>E. coolabah</i> and <i>Acacia harpophylla</i> . A sparse shrub layer was present containing <i>Terminalia oblongata</i> , <i>Santalum lanceolatum</i> and <i>A. salicina</i> . The understorey was dominated by exotic and native grasses including <i>C. ciliaris</i> *, <i>H. contortus</i> and <i>Aristida</i> spp. Infestations of <i>Parthenium hysterophorus</i> *, <i>Lantana camara</i> * and <i>Cenchrus ciliaris</i> * were also present throughout these areas (Photo 2).	41.23
11.9.5	25a	E	E	<i>Acacia harpophylla</i> open forest and woodland to 18 m. A sub-canopy to 6 m includes <i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> , <i>Eremophila mitchellii</i> , <i>Owenia acidula</i> , <i>Geijera parviflora</i> , <i>Terminalia oblongata</i> , <i>Lysiphyllum carronii</i> and <i>Atalaya hemiglauca</i> with scattered <i>Brachychiton rupestris</i> and <i>Ficus rubiginosa</i> . A mid-dense shrub layer contained <i>Alectryon diversifolius</i> , <i>Terminalia oblongata</i> , <i>Carissa ovata</i> , <i>Atalaya hemiglauca</i> , <i>Acacia harpophylla</i> , <i>Eremophila mitchellii</i> , <i>Denhamia oleaster</i> and <i>Flindersia dissosperma</i> . The sparse ground layer was dominated by native grasses and forbs including <i>Paspalidium caespitosum</i> , <i>Sporobolus caroli</i> , <i>Sporobolus creber</i> , <i>Ancistrachne uncinulata</i> , <i>Digitaria divaricatissima</i> , <i>Paspalidium caespitosum</i> , <i>Sporobolus australasicus</i> , <i>Aristida calycina</i> , <i>Tragus australianus</i> , <i>Enchylaena tomentosa</i> , <i>Grewia latifolia</i> , <i>Grewia retusifolia</i> , <i>Parsonsia lanceolata</i> , <i>Capparis lasiantha</i> , <i>Sida cunninghamii</i> , <i>Evolvulus alsinoides</i> , <i>Goodenia rotundifolia</i> , <i>Portulaca oleracea</i> , <i>Cyperus</i> sp. and <i>Salsola australis</i> (Photo 3)	6.51
11.9.9	13c	LC	NC	<i>Eucalyptus crebra</i> grassy woodland. <i>Eucalyptus moluccana</i> sometimes conspicuous on lower slopes. Occurs on Cainozoic to Proterozoic consolidated, fine-grained sediments. (Photo 4)	2.16



RE	BVG	VM Act ¹	Biodiversity Status ²	Vegetation Description	Total Remnant (ha)
11.10.7	12a	LC	NC	<i>Eucalyptus crebra</i> and/or <i>E. melanophloia</i> +/- <i>E. populnea</i> shrubby woodland. <i>Eucalyptus melanophloia</i> and/or <i>E. crebra</i> predominate and form a distinct but open canopy. <i>E. populnea</i> is commonly present and may be locally dominant particularly on lower slopes. A low tree to tall shrub layer usually dominated by a range of species including <i>Eremophila mitchellii</i> , <i>Acacia decora</i> , <i>A. longispicata</i> and <i>A. excelsa</i> is present. A low shrub layer with <i>Petalostigma pubescens</i> and other species is formed in places. The ground layer is variable in cover and composition but composed mainly of grasses. Occurs on the lower slopes of scarp retreats, associated with dissected tablelands. Associated soils are generally moderately deep, acidic, sandy, yellow earths and sandy-surfaced texture contrast soils formed from medium to coarse-grained sediments (Photo 5)	560.73
11.10.8/11.10.4a/ 11.10.7 (80/10/10)	-	-	-	11.10.8: Semi-evergreen vine thicket and microphyll rainforest. Occurs on medium to coarse-grained sediments that may be subject to local enrichment from adjacent rocks such as basalt as well as seepage (BVG 7a), not ground-truthed during the field survey 11.10.4a: (as described above) 11.10.7: (as described below)	10.26
11.10.7 / 11.10.4a (80/20)	12a	LC	NC	11.10.7 (as above) (Photo 6) 11.10.4a: <i>Eucalyptus crebra</i> , <i>Corymbia aureola</i> , <i>C. clarksoniana</i> and/or <i>Acacia shirleyi</i> woodland. Small areas that occur in conjunction with <i>E. decorticans</i> woodland. (BVG1M: 12a) (Photo 6)	666.62
Non remnant vegetation				Cleared	6.24
Total					1,341.18

¹ VM Act class: E - endangered, OC - of concern, LC - least concern; ² Biodiversity Status: E - endangered, OC - of concern, NC - no concern at present

* Exotic weed species





Photo 1. RE 11.3.4



Photo 2. RE 11.3.25



Photo 3. RE 11.9.5



Photo 4. RE 11.9.9



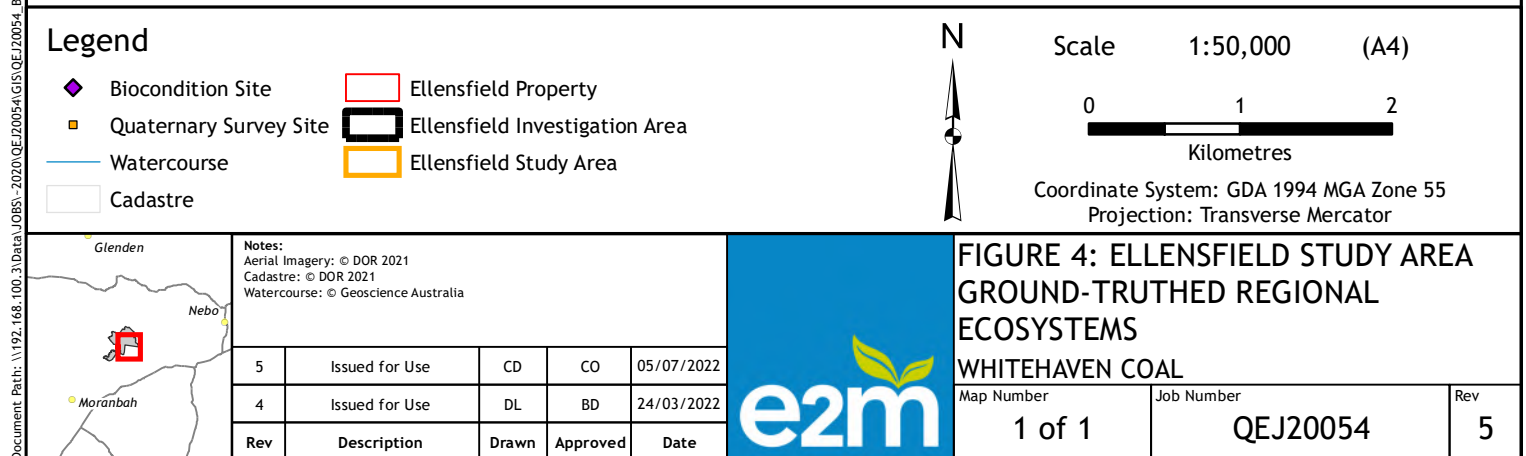
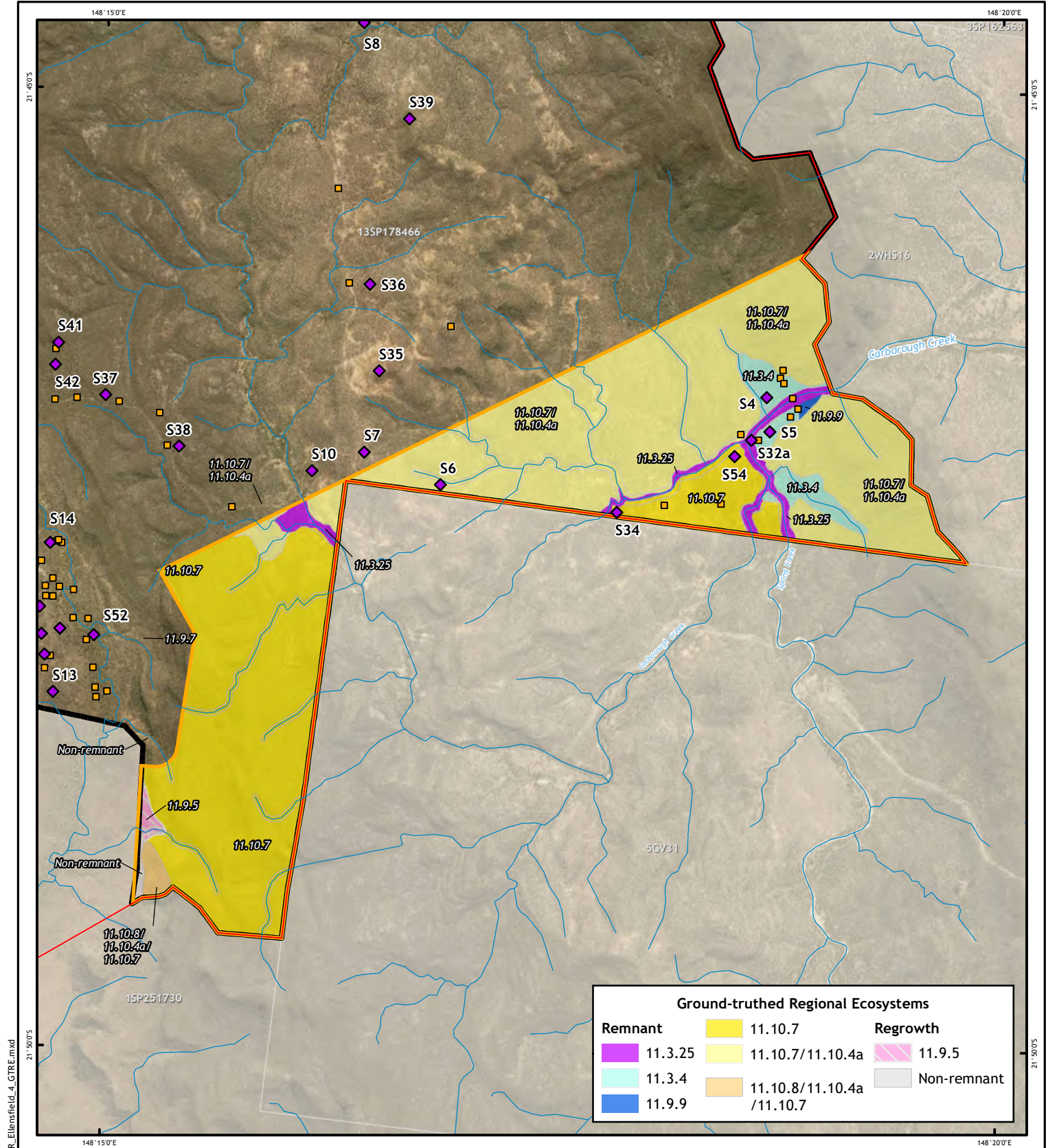


Photo 5. RE 11.10.7



Photo 6. RE 11.10.7/11.10.4a





3.2.2.2 Threatened Ecological Communities

Approximately 6.51 ha of RE 11.9.5 (one of the 16 REs classified as Brigalow TEC) is mapped within the Ellensfield Study Area (refer to Figure 5). Subject to meeting a condition threshold (i.e. exotic perennial plants comprise less than 50% of the polygon's total vegetation cover), the community is likely to qualify as a Brigalow TEC as it appears to be in remnant condition based on aerial photography. This polygon was not ground-truthed during the field survey as access to the area is limited, and the ecological community is not a target protected matter.

As discussed in Section 3.2.2.1, DNRME have mapped a mixed polygon consisting of approximately 8.21 ha of SEVT (RE 11.10.8); however, the SEVT community (RE 11.10.8) is not included as one of the 10 REs that comprise the SEVT of the Brigalow Belt (North and South) and Nandewar Bioregions TEC.

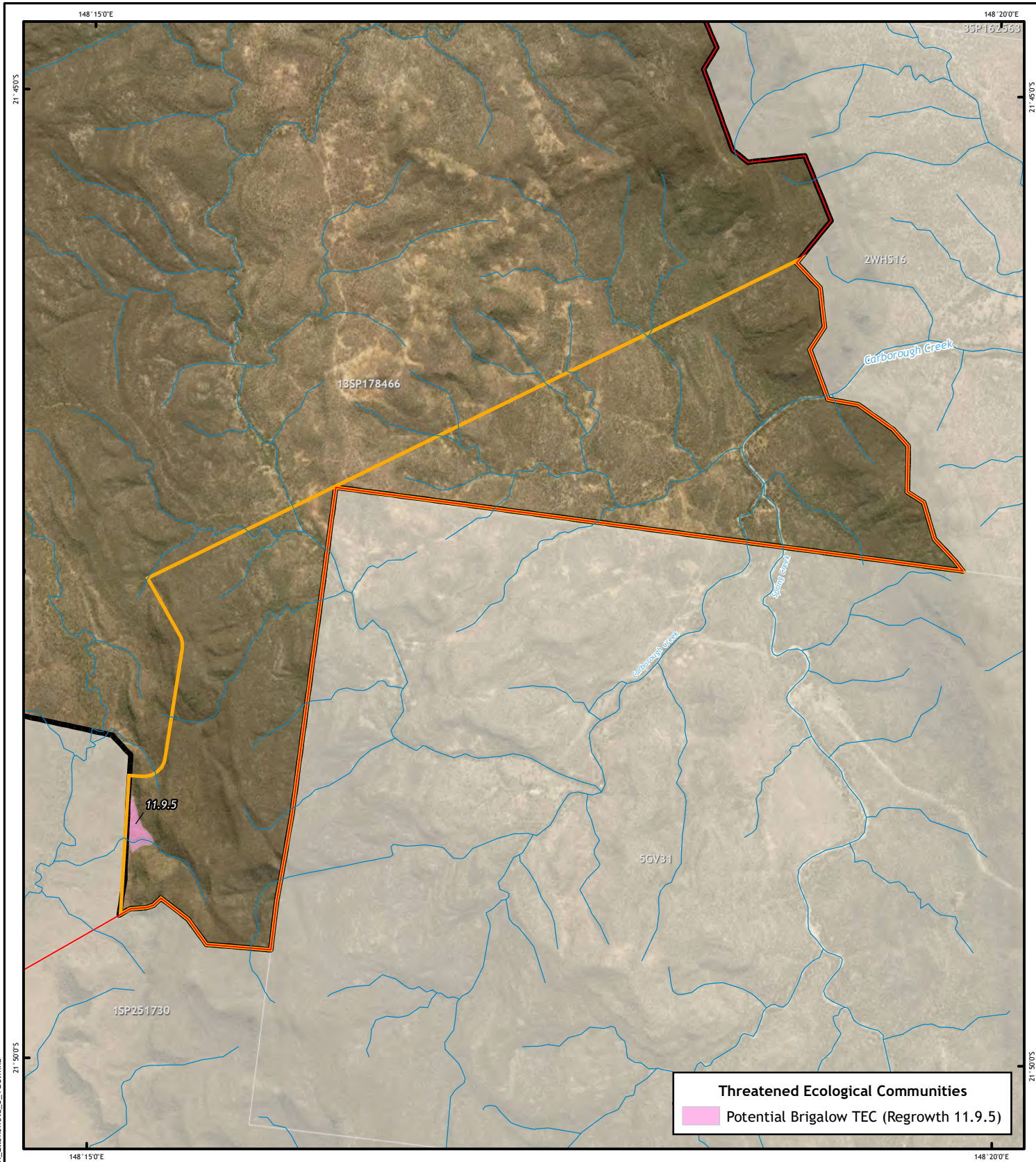
3.2.3 Threatened Flora Species

No target threatened flora species were recorded during the field surveys. While desktop searches indicate that the endangered *Solanum adenophorum* were historically found in the broader region, the REs recorded within the Ellensfield Study Area are do not provide suitable habitat. *Solanum adenophorum* habitat occurs within brigalow (*Acacia harpophylla*) and gidgee (*A. cambagei*) woodlands on deep cracking clays (Bean, 2004), which were not identified during field surveys.

3.2.4 Threatened Fauna Species

One greater glider was observed within close proximity (45 m) of the Ellensfield Study Area during the May 2021 field survey, with an additional two recorded within 500 m of the Ellensfield Study Area. Evidence of koala presence (i.e. scratches on trees [Photo 7]) was also recorded. Squatter pigeons were recorded approximately 337 m outside the Ellensfield Study Area within the Ellensfield Investigation Area. Figure 6 depicts the location of threatened fauna observations recorded during the May 2021 field surveys within the Ellensfield Investigation Area.





Legend

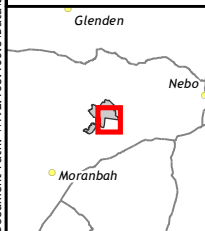
- Watercourse
- Cadastrate
- Ellensfield Property
- Ellensfield Investigation Area
- Ellensfield Study Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastrate: © DOR 2021
Watercourse: © Geoscience Australia

5	Issued for Use	CD	CO	05/07/2022
4	Issued for Use	DL	BD	24/03/2022
Rev	Description	Drawn	Approved	Date

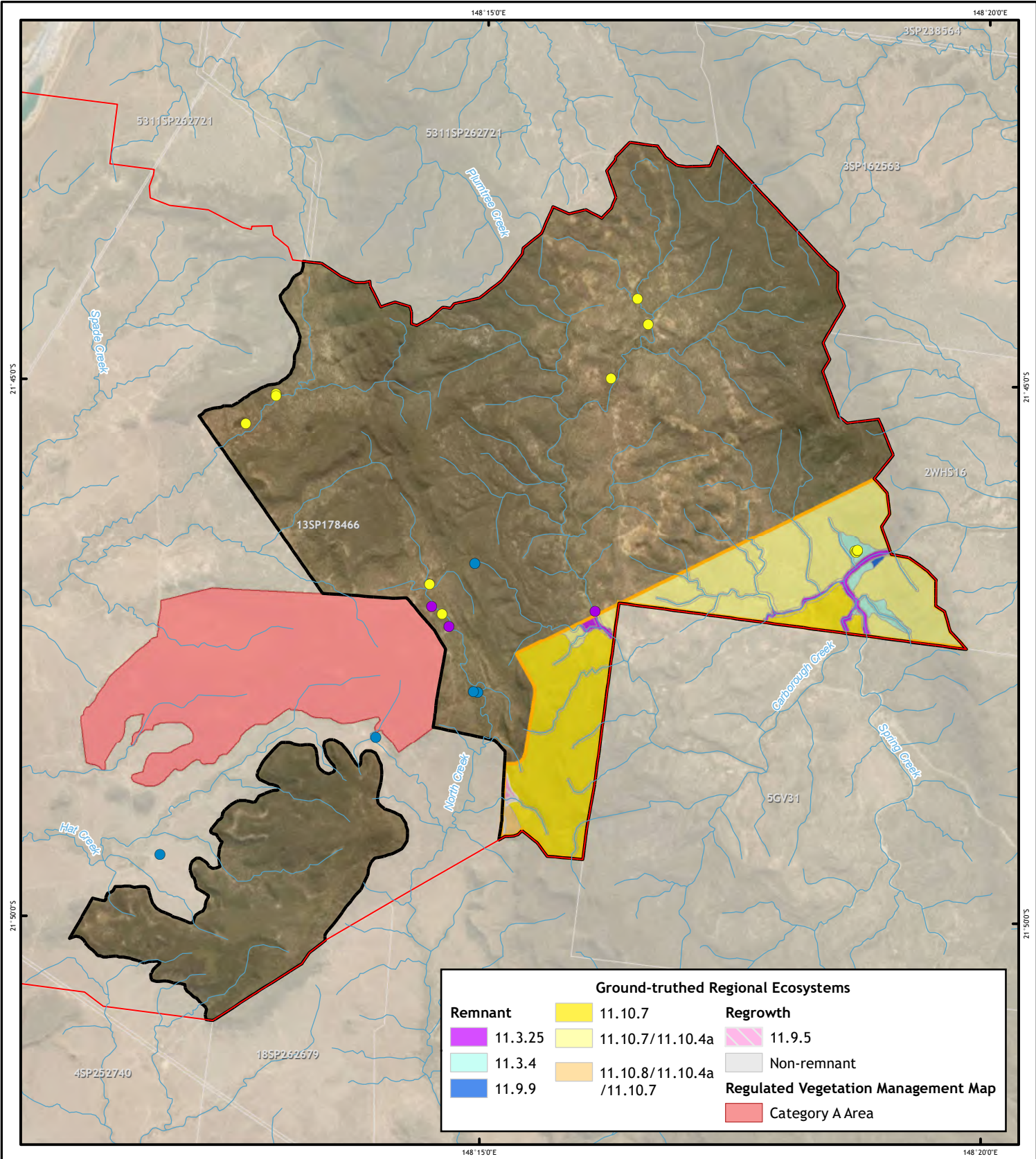


FIGURE 5: ELLENSFIELD STUDY AREA POTENTIAL TEC

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

Document Path: \\192.168.100.3\Data\JOBS-2020\QEJ20054\GIS\OEJ20054_BOR_Ellensfield_6_ThreatenedFaunaRecords.mxd



Ground-truthed Regional Ecosystems

Remnant
11.3.25
11.3.4
11.9.9

11.10.7

11.10.7/11.10.4a

11.10.8/11.10.4a / 11.10.7

Regrowth
11.9.5
Non-remnant

Regulated Vegetation Management Map
Category A Area

Legend

- Watercourse

Cadastrate

Ellensfield Property

Ellensfield Investigation Area
- Ellensfield Study Area

Greater Glider record (E2M, 2021)

Koala scratch record (E2M, 2021)

Squatter Pigeon record (E2M, 2021)

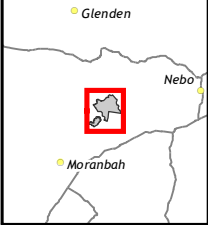


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0 1 2 3

Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:

Aerial Imagery: © DOR 2021

Cadastrate: © DOR 2021

Watercourse: © Geoscience Australia

Fauna records: © E2M 2021

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Rev	Description	Drawn	Approved	Date



FIGURE 6: THREATENED SPECIES RECORDS WITHIN THE ELLENSFIELD INVESTIGATION AREA

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

3.2.4.1 Koala (*Phascolarctos cinereus*)

Koala scratches were recorded on multiple trees within the Ellensfield Study Area (Photo 8 and Figure 6). The observations were recorded within the remnant eucalypt woodlands (RE 11.3.4 and 11.3.25) fringing Carborough Creek. Koala scratches were also recorded in similar habitat within several other locations within the Ellensfield Investigation Area (Figure 6).

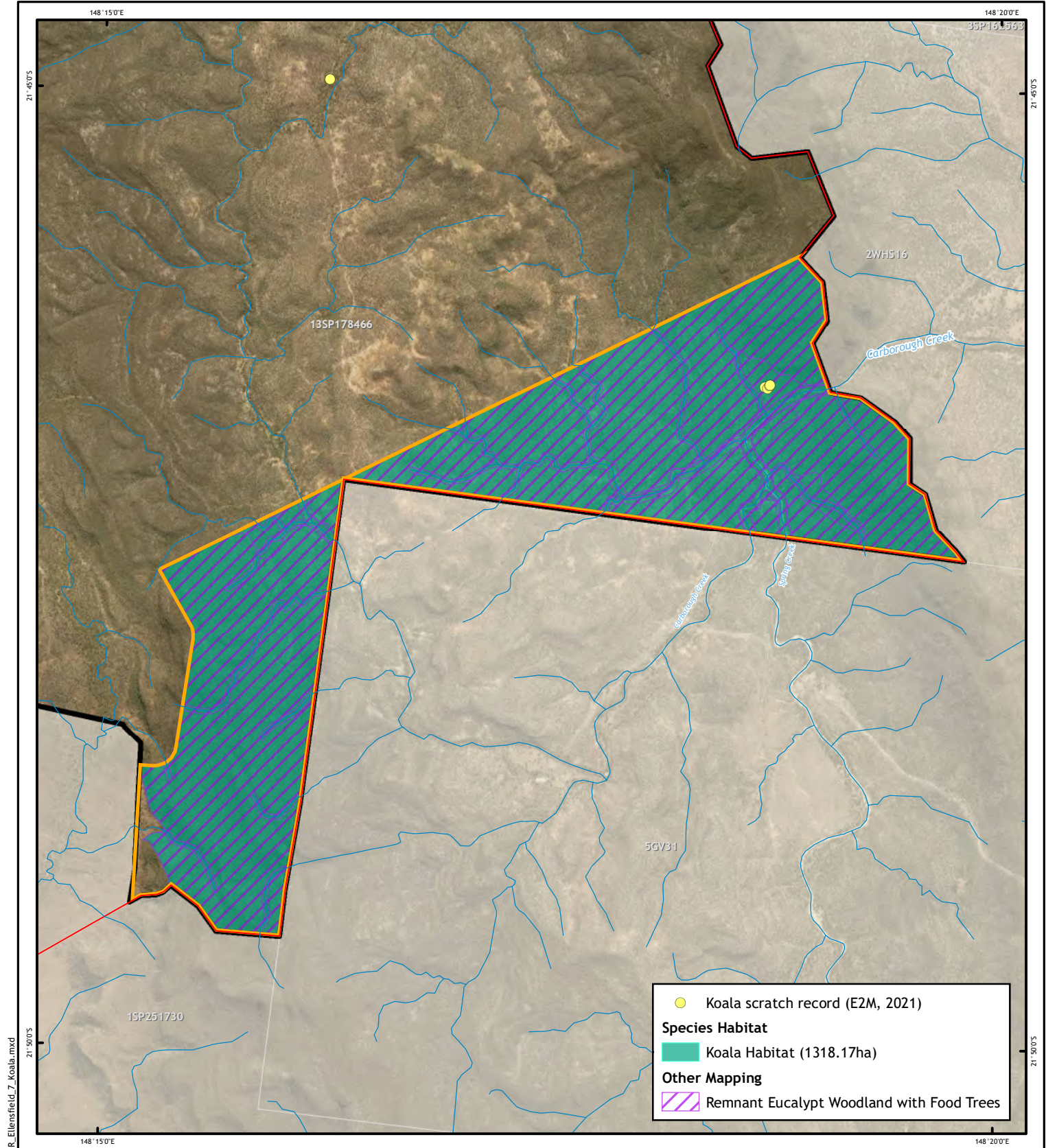
Studies of koala distribution, habitat utilisation and diet in central Queensland identified *Eucalyptus populnea*, *E. coolabah*, *E. tereticornis* and *E. crebra* or *E. drepanophylla* as preferred foraging species for koalas in the region (Ellis et al., 2018; Melzer et al., 2014). *E. camaldulensis* and *E. tereticornis* are also considered to be primary food trees for koalas within the Isaac Regional Council LGA (Australian Koala Federation, 2015). Both *E. camaldulensis* and *E. tereticornis* occur within RE 11.3.25 (riparian areas), while *E. tereticornis* also occurs in RE 11.3.4. *Eucalyptus crebra* is the dominant species in REs 11.9.9 and 11.10.7 within the Ellensfield Study Area.

The majority of the Ellensfield Study Area was identified as being suitable koala habitat as it is comprised of remnant eucalypt woodland dominated by koala food trees (Figure 7). Koala habitat within the Ellensfield Study Area is mapped within remnant REs 11.3.4, 11.3.25, 11.9.9, 11.10.7/11.10.4a and 11.10.7, with a combined total of 1,318.16 ha.



Photo 7. Koala scratch marks on *E. tereticornis*





Legend

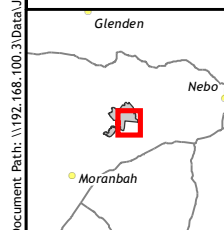
- Watercourse
- Cadastre
- Ellensfield Property
- Ellensfield Investigation Area
- Ellensfield Study Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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FIGURE 7: ELLENSFIELD STUDY AREA KOALA HABITAT

WHITEHAVEN COAL

Map Number
1 of 1

Job Number
QEJ20054

Rev 5

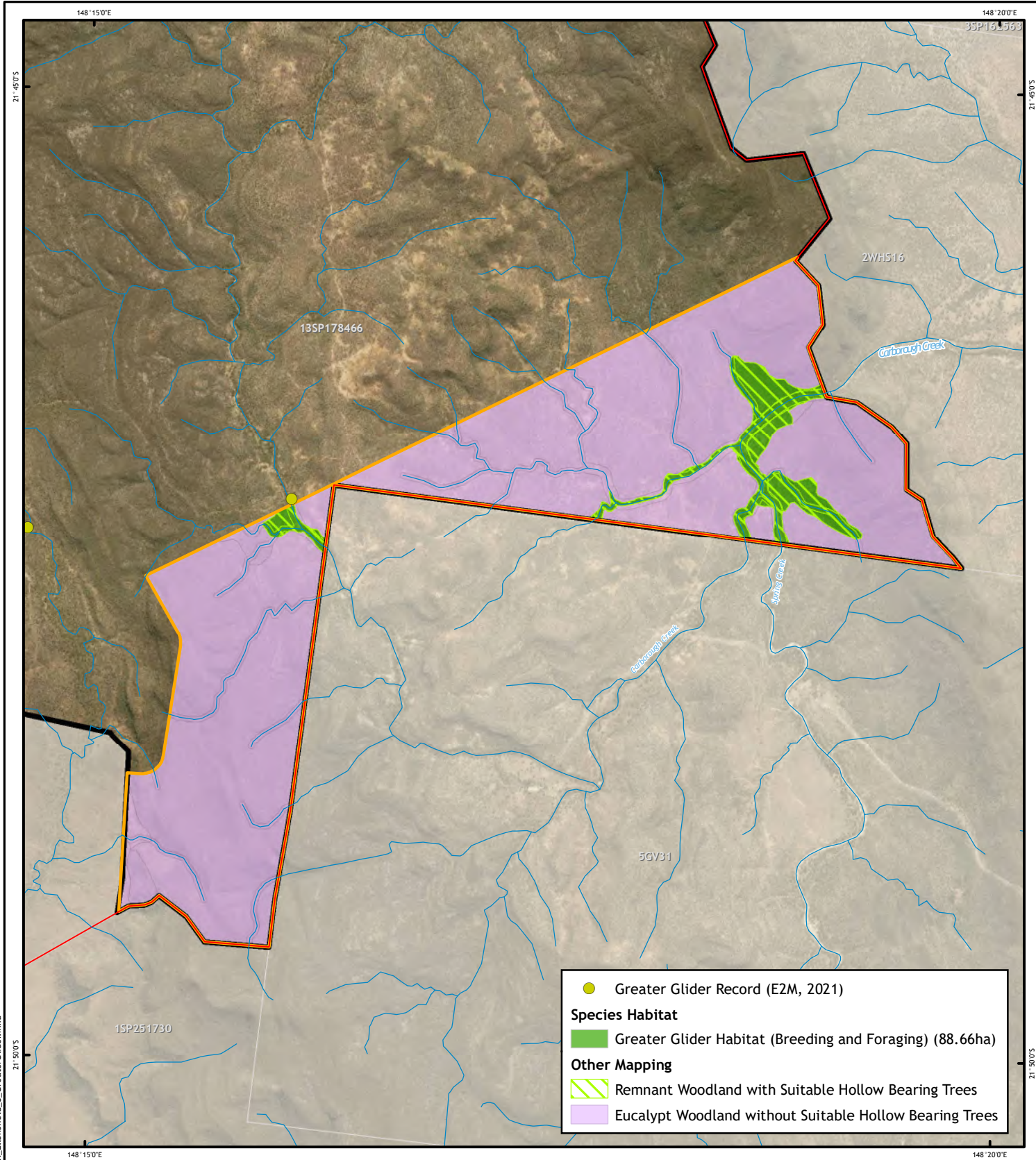
3.2.4.2 Greater glider (*Petauroides volans*)

Greater glider habitat is largely restricted to eucalypt forests and woodlands. The species' diet comprises mostly of eucalypt leaves and sometimes eucalypt flowers (Threatened Species Scientific Committee, 2016). During the day, greater gliders shelter in large tree hollows and a strong correlation exists between the abundance of large hollows and the number of greater gliders (Andrews et al., 1994). The greater glider also favours a diverse range of eucalypt species within their local range because of variability in food preference across seasons (Kavanagh, 1984).

Diurnal habitat assessments within the Ellensfield Study Area identified suitable greater glider habitat in eucalypt dominated riparian woodlands along Carborough Creek. These areas typically contained plentiful medium to large hollows and feed tree species associated along and surrounding the watercourses. One greater glider was recorded within close proximity (45 m) of the Ellensfield Study Area and two additional greater gliders were observed approximately 500 m outside the Ellensfield Study Area within the Ellensfield Investigation Area (Figure 8). The Ellensfield Investigation Area is well connected through contiguous vegetation and watercourses which link/connect to habitat within the Ellensfield Study Area. The Ellensfield Study Area contains approximately 88.66 ha of greater glider habitat within remnant REs 11.3.4 and 11.3.25 (Figure 8).



Photo 8. Greater glider observed within the Ellensfield Investigation area during the May 2021 field survey



Legend

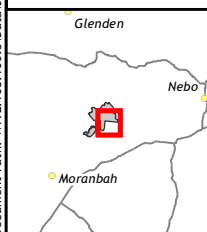
- Watercourse
- Cadastre
- Ellensfield Property
- Ellensfield Investigation Area
- Ellensfield Study Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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Watercourse: © Geoscience Australia

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FIGURE 8: ELLENSFIELD STUDY AREA GREATER GLIDER HABITAT

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

3.2.4.3 Squatter pigeon (southern subspecies) (*Geophaps scripta scripta*)

Squatter pigeon (southern subspecies) was not recorded in the Ellensfield Study Area during the field survey but was observed on numerous occasions within the broader Ellensfield Investigation Area (Figure 9; Photo 9). They are considered very likely to also inhabit the Ellensfield Study Area.

Squatter pigeon (southern subspecies) foraging and breeding habitat consists of remnant or regrowth open-forest to sparse, open-woodland or low-woodland dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species on:

- well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. land zone 5); and
- lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. land zone 7) (DAWE, 2021b; Squatter Pigeon Workshop, 2011).

Squatter Pigeon habitat is distinguished by ground-layer vegetation that:

- consists of patchy, native, perennial tussock grasses, or a mix of perennial tussock grasses and low shrubs or forbs; and
- does not cover more than 33% of the ground (DAWE, 2021b; Squatter Pigeon Workshop, 2011).

Additionally, squatter pigeon foraging habitat is within 3 km of a suitable, permanent or seasonal waterbody, while breeding and foraging habitat is located within 1 km of a suitable, permanent or seasonal waterbody (DAWE, 2021b; Squatter Pigeon Workshop, 2011). Within the Ellensfield Study Area, there are no permanent waterbodies however, there are numerous ephemeral creeks (Figure 9).

Dispersal habitat is any area (<100 m wide) located between patches of foraging habitat, breeding habitat and/or waterbodies which facilitates movement. Dispersal habitat includes vegetation such as exotic grassland pasture where the groundcover layer has been thinned through current land use practices in a way that suits the species (e.g. light cattle grazing). The species does disperse into highly modified or degraded habitats, including cleared areas which are within 100 m of remnant trees or patches of habitat.

There is approximately 1,324.68 ha of suitable dispersal habitat throughout the Ellensfield Study Area (located on land zones not suitable for breeding or foraging) comprising:

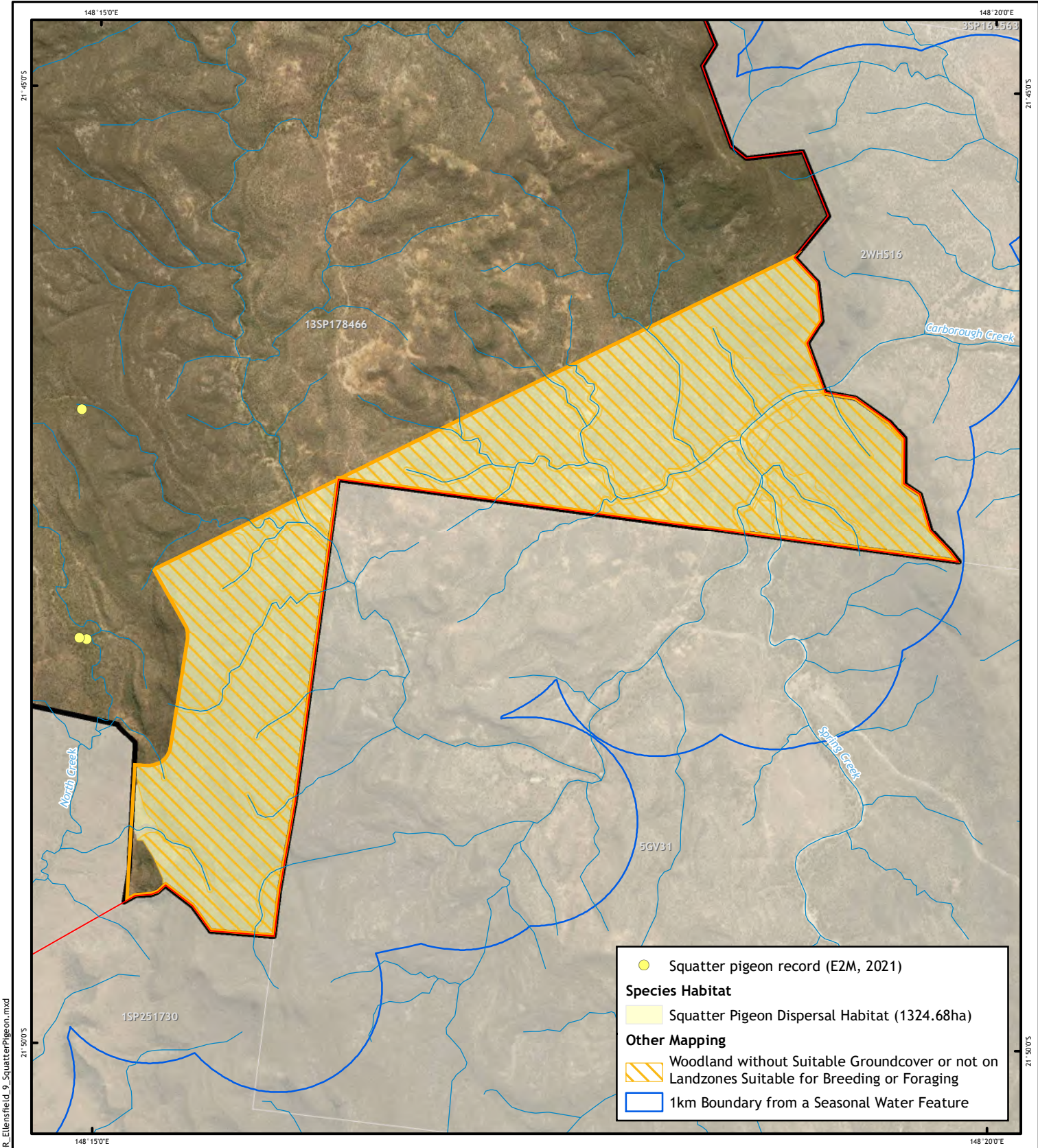
- RE 11.3.4 (remnant)
- RE 11.3.25 (remnant)
- RE 11.9.5 (high value regrowth)
- RE 11.9.9 (remnant)
- RE 11.10.7 (remnant); and
- RE 11.10.7/11.10.4a (remnant).

Due to the lack of suitable land zones within the Ellensfield Study Area, no squatter pigeon breeding or foraging habitat was identified.





Photo 9. Squatter pigeon observed within the Ellensfield Investigation Area during the May 2021 field survey



Legend

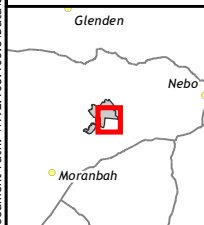
- Seasonal Watercourse / Drainage
- Cadastre
- Ellensfield Property
- Ellensfield Investigation Area
- Ellensfield Study Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



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Watercourse: © Geoscience Australia

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FIGURE 9: ELLENSFIELD STUDY AREA SQUATTER PIGEON HABITAT

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

3.2.4.4 Ornamental snake (*Denisonia maculata*)

Ornamental snake habitat was not identified during the May 2021 field survey of the Ellensfield Investigation Area (including the Ellensfield Study Area). No historic and/or previous species records occur within the Ellensfield property (as per the Desktop Assessment (Section 3.1)).

The species is generally recorded in association with Brigalow vegetation communities with gilgai and cracking clay soils of which none were observed within the Ellensfield Study Area.

6.51 ha of potential ornamental snake habitat is mapped within RE 11.9.5. This polygon however, was not ground truthed during the field survey as access was limited. However, other patches of 11.9.5 that were ground-truthed within the broader Ellensfield Investigation Area did not contain gilgai or cracking clay soils that ornamental snake are typically associated with. It is therefore considered unlikely that suitable ornamental snake habitat occurs within the Ellensfield Study Area.

3.2.5 Ecological Function

3.2.5.1 Waterway and Wetland Features

Carborough Creek (Stream Order SO 4) and Spring Creek (SO 3) are large ephemeral watercourses located in the eastern central part of the Ellensfield Study Area, with numerous tributaries of lower order feeding into these systems.

Watercourse MSES attributes were calculated using the, DES Land Use Planning, Environmental Policy and Planning, Methods for mapping Matters of State Environmental Significance (DES, 2020b). The Ellensfield Study Area contains approximately 135.6 ha of remnant vegetation within the defined distance from the defining banks of a watercourse that qualify as a MSES (Figure 10).

No MSES high ecological significant (HES) wetlands are present within the Ellensfield Study Area.

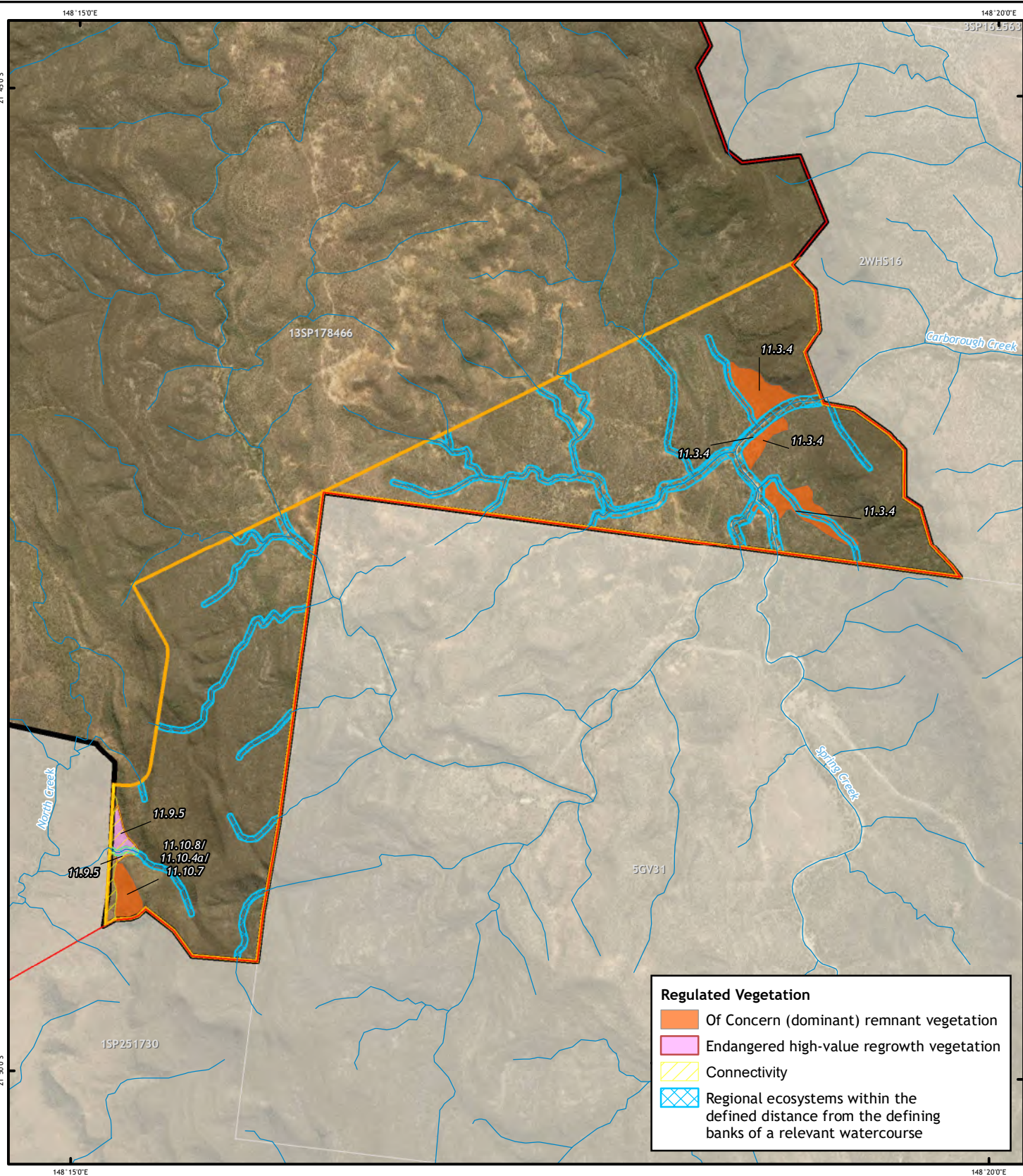
Table 4. Watercourse REs (MSES) within the Ellensfield Study Area

Watercourse RE	Broad condition class	VM Act Status	Area (ha)
11.3.4	16c	Of concern	9.61
11.3.25	16a	Least concern	35.37
11.9.5	25a	Endangered	1.37
11.9.9	13c	Least concern	0.12
11.10.7	12a	Least concern	38.08
11.10.7/11.10.4a	12a/12a	Least concern	51.05
TOTAL			135.6

3.2.5.2 Connectivity

Non-remnant areas are able to be used to offset connectivity impacts when located within the same subregion according to the Queensland Environmental Offsets Policy (DES, 2021b). The Ellensfield Study Area only contains 12.75 ha of connectivity areas including 6.24 ha of non-remnant area and 6.51 ha of high value regrowth.





Legend

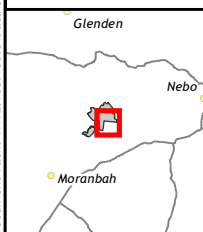
- Seasonal Watercourse / Drainage
- Cadastral
- Ellensfield Property
- Ellensfield Investigation Area
- Ellensfield Study Area



Scale 1:50,000 (A4)

0 1 2
Kilometres

Coordinate System: GDA 1994 MGA Zone 55
Projection: Transverse Mercator



Notes:
Aerial Imagery: © DOR 2021
Cadastral: © DOR 2021
Watercourse: © Geoscience Australia

5	Issued for Use	CD	CO	05/07/2022
4	Issued for Use	DL	BD	24/03/2022
Rev	Description	Drawn	Approved	Date



FIGURE 10: ELLENSFIELD STUDY AREA MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

WHITEHAVEN COAL

Map Number	Job Number	Rev
1 of 1	QEJ20054	5

3.3 MNES and MSES Summary

The Ellensfield Study Area supports habitat for the following target MNES:

- koala
- greater glider; and
- squatter pigeon (dispersal habitat only, no breeding or foraging habitat).

Approximately 6.51 ha of RE 11.9.5 is mapped within the Ellensfield Study Area and is likely to qualify as a Brigalow TEC (refer to Figure 5). This polygon however, was not ground-truthed during the field survey as access to the area is limited, and the ecological community is not a target protected matter. This area is also considered unlikely to contain suitable habitat for ornamental snake.

A number of ground-truthed ecological values classified as MSES (Figure 4), under the Queensland *Environmental Offset Act 2014* (EO Act), were identified within the Ellensfield Study Area, including:

- Regulated Vegetation, comprising:
 - ‘Of Concern’ remnant REs
 - ‘Endangered’ high value regrowth RE
 - prescribed REs located within a defined distance from the defining banks of a mapped watercourse; and
- protected wildlife habitat for targeted threatened species known to occur (i.e. species detected during field surveys), including koala, greater glider and squatter pigeon.

A summary of the relevant MNES and MSES values identified within the Ellensfield Study Area is provided in Table 5.

Table 5. MNES and MSES Recorded within the Ellensfield Study Area

Environmental Matter	Relevant RE(s)	Broad condition class	Area available within the Ellensfield Study Area (ha)
MNES known to occur			
koala (<i>Phascolarctos cinereus</i>)	11.3.4, 11.3.25, 11.9.9, 11.10.4a and 11.10.7	remnant	1,318.16
greater glider (<i>Petauroides volans</i>)	11.3.4 and 11.3.25	remnant	88.66
squatter pigeon (<i>Geophaps scripta scripta</i>)	11.3.4, 11.3.25, 11.9.5, 11.9.9, 11.10.4a and 11.10.7	remnant and high value regrowth	1,324.68 (dispersal habitat)
MSES known to occur (including the MNES above)			
Endangered RE	11.9.5 (BVG 25a)	high value regrowth	6.51
Of Concern REs	11.3.4 (BVG 16c)	remnant	47.43
	11.10.8 (BVG 7a)	remnant	8.21
Watercourse REs	11.3.4 (BVG 16c)	remnant	9.61



Environmental Matter	Relevant RE(s)	Broad condition class	Area available within the Ellensfield Study Area (ha)
	11.3.25 (BVG 16a)	remnant	35.37
	11.9.9 (BVG 13c)	remnant	0.12
	11.10.7 (BVG 12a)	remnant	38.08
	11.10.7/11.10.4a (BVG 12a/12a)	remnant	51.05
Connectivity	-	Non-remnant	12.75

3.4 Habitat Quality Assessment Results

3.4.1 Landscape-scale Attribute Score

A summary of landscape-scale attribute scores for the Ellensfield Study Area are summarised in Table 6. The Ellensfield Study Area is located within a continuous landscape of remnant vegetation. The Ellensfield Study Area has a total landscape-scale attribute score of 20 out of 20.

Table 6. Landscape-scale Attribute Scores

Landscape attribute	Comment	Score
Patch size	>500 ha of remnant	10
Connectivity	100% remnant adjacent and >500 ha remnant	5
Context	100% remnant	5
Ecological Corridors	Located partially within a mapped Biodiversity corridors (state terrestrial corridor)	-
Total		20



3.4.2 Site-based Attribute Scores

A total of 49 BioCondition Survey Sites were conducted within 11 Assessment Units (AUs) across the Ellensfield Investigation Area. Of the 11 AUs, five are found within the Ellensfield Study Area (Table 6). The number of BioCondition Assessment survey sites conducted within each of the five AUs located in the Ellensfield Study Area includes the survey data collected within the corresponding AUs across the Investigation Area.

The raw BioCondition Assessment data for the Ellensfield Study Area is provided in Appendix B.

AUs are characterised by vegetation height, cover, and species consistent with the BioCondition Benchmarks. The vegetation conditions within the Ellensfield Study Area AUs were in good condition. Site condition attributes leading to a reduction in Habitat Quality scores included:

- low native tree, shrub, grass and native forb species richness and cover, potentially due to the introduction of exotic pasture species for livestock grazing
- high non-native plant cover, particularly from non-native grasses and forbs, including buffel grass (*Cenchrus ciliaris**), *Harrisia martini*, *Sida cordifolia*, and *Parthenium hysterophorus** (parthenium); and
- low coarse woody debris cover, potentially due to grazing management and historical clearing (selective) and thinning of large trees.

The overall vegetation condition within the Ellensfield Study Area has been degraded by cattle grazing and the introduction of weeds.

Table 7. Site-based Attribute Scores

Environmental Matter	Relevant RE(s)	Broad condition state	AU	Area (ha)	Average site-based attribute score (/10)
MNES known to occur					
koala (<i>Phascolarctos cinereus</i>)	11.3.4	remnant	2	47.43	6.14
	11.3.25	remnant	3	41.23	
	11.9.9	remnant	9	2.16	
	11.10.4a	remnant	10	133.32	
	11.10.7	remnant	11	1,094.02	
greater glider (<i>Petauroides volans</i>)	11.3.4	remnant	2	47.43	6.17
	11.3.25	remnant	3	41.23	
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	11.3.4	remnant	2	47.43	6.15
	11.3.25	remnant	3	41.23	
	11.9.5	High value regrowth	6	6.51	
	11.9.9	remnant	9	2.16	
	11.10.4a	remnant	10	133.32	



	11.10.7	remnant	11	1,094.02	
MSES known to occur (in addition to the MNES listed above)					
Endangered RE	11.9.5	High value regrowth	6	6.51	7.33
Of concern RE	11.3.4	remnant	2	47.43	6.49
	11.10.8	remnant	NA	8.21	NA
Watercourse REs	11.3.4	remnant	2	9.61	6.49
	11.3.25	remnant	3	35.37	5.80
	11.9.9	remnant	9	0.12	7.50
	11.10.4a	remnant	10	10.21	6.76
	11.10.7	remnant	11	78.92	6.06

3.4.3 Fauna Species-based Attribute Scores

Species habitat attributes indicate the ability of the area to support a particular fauna species based on their specific habitat requirements (Table 8). Each individual score has a 25% weighting. Consistent with the approach undertaken to assess site-based attribute scores (Section 3.4.2) habitat attribute scores have been calculated using the data collected across the Ellensfield Investigation Area. Each score is out of a maximum value of 25. Fauna species-based condition data for the Ellensfield Study Area is provided in Appendix C.

Table 8. Fauna Species-Based Attribute Score Summary

Species	Habitat attribute	Indicator	Score
koala (<i>Phascolarctos cinereus</i>)	Quality and availability of food and habitat required for foraging	Abundance of koala food trees (<i>Eucalyptus</i> spp.)	15
	Quality and availability of habitat required for shelter and breeding	Abundance of koala shelter trees	15
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation	20
	Threat abundance	Historical clearing/fragmentation	
		Abundance of feral dogs	17
Vehicle strike risk			
			6.7/10
greater glider (<i>Petauroides volans</i>)	Quality and availability of food and habitat required for foraging	Abundance of food trees/canopy cover	12.5
	Quality and availability of habitat required for shelter and breeding	Abundance of large hollows/canopy cover	10



Species	Habitat attribute	Indicator	Score	
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation	20	
	Threat abundance	Historical clearing/fragmentation	18.5	
		Bushfire risk (low)		
		Barbwire entanglement risk		
	6.1/10			
squatter pigeon (southern subspecies) (<i>Geophaps scripta scripta</i>)	Quality and availability of food and habitat required for foraging	Vegetation condition (remnant, non-remnant, regrowth)	10	
	Quality and availability of habitat required for shelter and breeding	Average distance to water, well draining soil, ground cover density	8.75	
	Quality and availability of habitat required for mobility	Cover	25	
	Threat abundance	Historical clearing	12	
		Weeds and pasture grass incursion		
		Abundance of pests (feral dogs/cats)		
	Overall Habitat Quality Score			6.03/10



4 Conclusion

Field surveys of the Ellensfield investigation Area successfully identified target MNES and MSES values. Table 9 outlines the relevant MNES and MSES identified within the Ellensfield Study Area. Fauna species habitat attribute scores and habitat quality scores were less than benchmark scores with downgrading largely due to grazing modifications made to the landscape such as the introduction of weed and pest species.

Table 9. Summary of findings for all relevant MNES and MSES

Environmental Matter	Relevant RE(s)	Broad condition class	Area available within the Ellensfield Study Area (ha)
MNES known to occur			
koala (<i>Phascolarctos cinereus</i>)	11.3.4, 11.3.25, 11.9.9, 11.10.4a and 11.10.7	remnant	1,318.16
greater glider (<i>Petauroides volans</i>)	11.3.4 and 11.3.25	remnant	88.66
squatter pigeon (<i>Geophaps scripta scripta</i>)	11.3.4, 11.3.25, 11.9.5, 11.9.9, 11.10.4a and 11.10.7	remnant and high value regrowth	1,324.68 (dispersal habitat)
MSES known to occur (including the MNES above)			
Endangered RE	11.9.5 (BVG 25a)	high value regrowth	6.51
Of Concern REs	11.3.4 (BVG 16c)	remnant	47.43
	11.10.8 (BVG 7a)	remnant	8.21
Watercourse REs	11.3.4 (BVG 16c)	remnant	9.61
	11.3.25 (BVG 16a)	remnant	35.37
	11.9.9 (BVG 13c)	remnant	0.12
	11.10.7 (BVG 12a)	remnant	38.08
	11.10.7/11.10.4a (BVG 12a/12a)	remnant	51.05



5 References

- Andrews, S. P., Gration, G., Quin, D., & Smith, A. P. (1994). *Description and assessment of forestry impacts on fauna of the Urbenville Forestry Management Area. Report for State Forests of New South Wales.*
- Atlas of Living Australia. (2021). *Atlas of Living Australia Occurrence Records.* <https://www.ala.org.au/>
- Australian Koala Federation. (2015). *Australian Koala Foundation National Koala Tree Planting List.* Australian Koala Federation.
- Bean, A. R. (2004). The taxonomy and ecology of *Solanum* subg. *Leptostemonum* (Dunal) Bitter (Solanaceae) in Queensland and far north-eastern New South Wales, Australia. *Austrobaileya*, 6(4), 639-816.
- Bureau of Meteorology. (2021). *Climate Data Online.* <http://www.bom.gov.au/climate/data/>
- Cropper, S. (1993). *Management of Endangered Plants.* CSIRO Publishing.
- Department of Agriculture, Water and the Environment. (2021a). *Protected Matters Search Tool.* <http://www.environment.gov.au/epbc/pmst/>
- Department of Agriculture, Water and the Environment. (2021b). *Species Profile and Threats Database.* <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Department of Environment and Science. (2018). *Regional Ecosystem Technical Descriptions for the Brigalow Belt Bioregion.* Queensland Government. <https://www.publications.qld.gov.au/dataset/re-technical-descriptions>
- Department of Environment and Science. (2020a). *Guide to determining terrestrial habitat quality Methods for assessing habitat quality under the Queensland Environmental Offsets Policy Version 1.3.* Queensland Government. https://environment.des.qld.gov.au/__data/assets/pdf_file/0017/102833/habitat-quality-assessment-guide-v1-3.pdf
- Department of Environment and Science. (2020b). *Method for mapping Matters of state environmental significance For the State Planning Policy 2017 (Version 6.0).* Department of Environment and Science. https://environment.des.qld.gov.au/__data/assets/pdf_file/0037/88687/mses-methodology.pdf
- Department of Environment and Science. (2021a). *Matters of State Environmental Significance (MSES) Report Online.* Department of Environment and Science. <https://www.qld.gov.au/environment/pollution/management/environmental-reports-online>



Department of Environment and Science. (2021b). *Queensland Environmental Offsets Policy (version 1.11)*. Department of Environment and Science.

https://environment.des.qld.gov.au/__data/assets/pdf_file/0022/255226/offsets-policyv1-11.pdf

Department of Environment and Science. (2021c). *Queensland Statewide Corridors* [Map]. Department of Environment and Science. <https://www.data.qld.gov.au/dataset/queensland-statewide-corridors>

Department of Environment and Science. (2021d). *Wildlife Online Extract*.

<https://apps.des.qld.gov.au/report-request/species-list/>

Department of Resources. (2020a). *Queensland Detailed Surface Geology*. Department of Resources.

<https://qldspatial.information.qld.gov.au/catalogue/custom/detail.page?fid={9BA2F66C-1933-4439-B9C9-E631911ADD7E}>

Department of Resources. (2020b). *Vegetation management regulated vegetation management map—Version 4.10*. Queensland Government.

<https://www.data.qld.gov.au/dataset/vegetation-management-act-series>

Department of Resources. (2021). *QImagery*. QImagery. <https://qimagery.information.qld.gov.au/>

Department of Sustainability, Environment, Water, Population and Communities. (2011a). *Draft referral guidelines for the nationally listed Brigalow Belt reptiles*. Australian Government.

<https://www.awe.gov.au/sites/default/files/documents/draft-referral-guidelines-comment-brigalow-reptiles.pdf>

Department of Sustainability, Environment, Water, Population and Communities. (2011b). *Survey guidelines for Australia's threatened mammals*.

<https://www.awe.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf>

Department of Sustainability, Environment, Water, Population and Communities. (2011c). *Survey guidelines for Australia's threatened reptiles*. Australian Government.

<https://www.awe.gov.au/sites/default/files/documents/survey-guidelines-reptiles.pdf>

Department of the Environment. (2013). *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) ecological community*. Department of the Environment.

<http://www.environment.gov.au/biodiversity/threatened/communities/pubs/028-conservationadvice.pdf>

Department of the Environment. (2014). *EPBC Act referral guidelines for the vulnerable koala*. Australian Government.

<https://www.environment.gov.au/system/files/resources/dc2ae592-ff25-4e2c-ada3-843e4dea1dae/files/koala-referral-guidelines.pdf>



Department of the Environment, Water, Heritage and the Arts. (2010). *Survey guidelines for Australia's threatened birds*. Australian Government.

<https://www.awe.gov.au/sites/default/files/documents/survey-guidelines-birds-april-2017.pdf>

Ellis, W., FitzGibbon, S., Gillett, A., Hulse, L., & Barth, B. (2018). *Queensland Trust for Nature Koala Project*. The University of Queensland.

Geoscience Australia. (2021). *Australian Stratigraphic Units Database*. Australian Government.

<https://asud.ga.gov.au/search-stratigraphic-units>

Kavanagh, R. P. (1984). Seasonal changes in habitat use by gliders and possums in southeastern New South Wales. In *Possums and Gliders* (pp. 527-543). Surrey Beatty and Sons.

Melzer, A., Cristescu, R., Ellis, W., FitzGibbon, S., & Manno, G. (2014). The habitat and diet of koalas (*Phascolarctos cinereus*) in Queensland. *Australian Mammalogy*, 36(2), 189-199.

Neldner, V. J., Wilson, B. A., Dillewaard, H. A., Ryan, T. S., & Butler, D. W. (2020). *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland v.5.1*. Queensland Herbarium, Queensland Department of Science, Information Technology and Innovation.

Queensland Herbarium. (2018). *Terrestrial vertebrate fauna survey guidelines for Queensland*.

Queensland Government. https://www.qld.gov.au/__data/assets/pdf_file/0022/68224/fauna-survey-guidelines.pdf

Queensland Herbarium. (2021). *BioCondition Benchmark Database (Version 3.1)*.

Specht, R. L. (1970). Vegetation. In *Australian Environment* (4th ed., pp. 44-67). Melbourne University Press.

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

Threatened Species Scientific Committee. (2016). *Approved Conservation Advice for Petauroides volans (greater glider)*. Department of the Environment.

<http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf>





Appendix A Ellensfield Study Area Database Search Results





EPBC Act Protected Matters Report

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

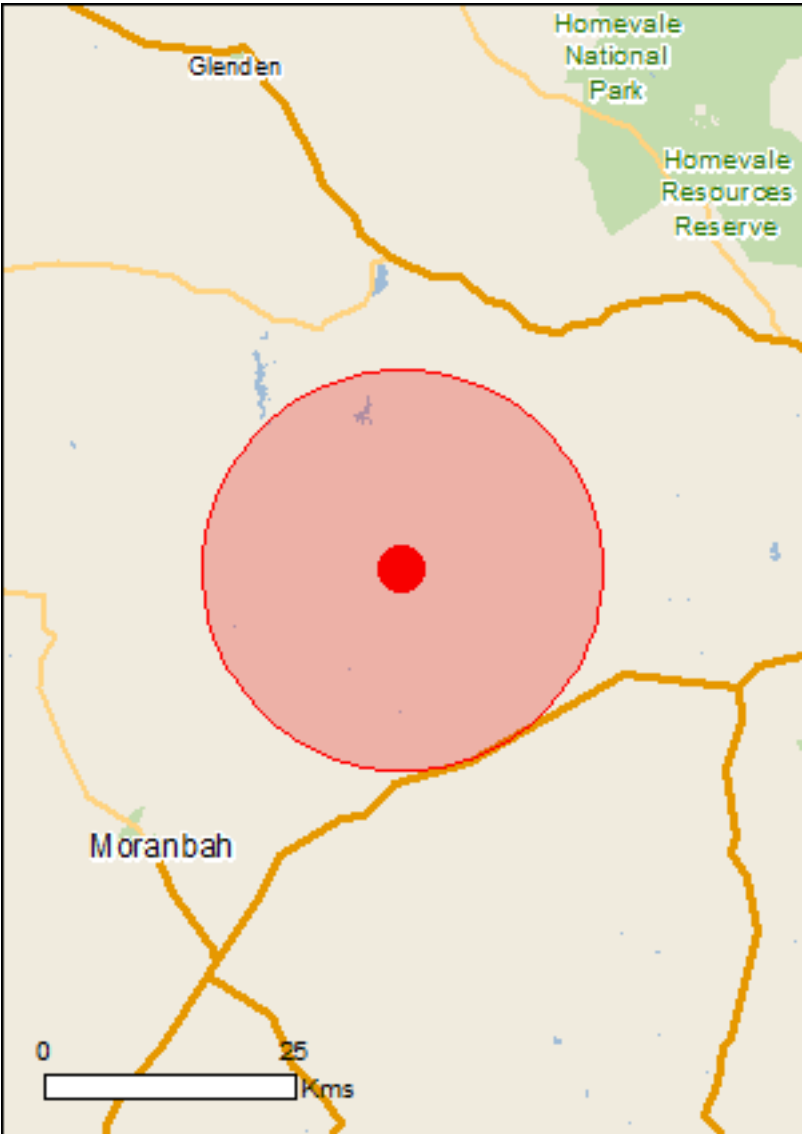
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 26/05/21 09:05:57

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

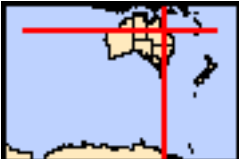
[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



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

[Coordinates](#)

Buffer: 20.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	21
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	16
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	18
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[Resource Information]

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

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to 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
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Mammals

Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Plants		
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lerista allanae Allan's Lerista, Retro Slider [1378]	Endangered	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]	Critically Endangered	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Tringa nebularia 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 EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]	Critically Endangered	Species or species habitat may 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
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]	Endangered*	Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]		Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Invasive Species	[Resource Information]
------------------	--------------------------

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

Name	Status	Type of Presence
Birds		
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species

Name	Status	Type of Presence
Capra hircus Goat [2]		habitat likely to occur within area Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata 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
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]		Species or species habitat likely to occur within area

Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-21.77319 148.26211

Acknowledgements

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

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

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

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

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Queensland Government

Department of Environment and Science

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest
Lot: 13 Plan: SP178466

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.

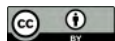


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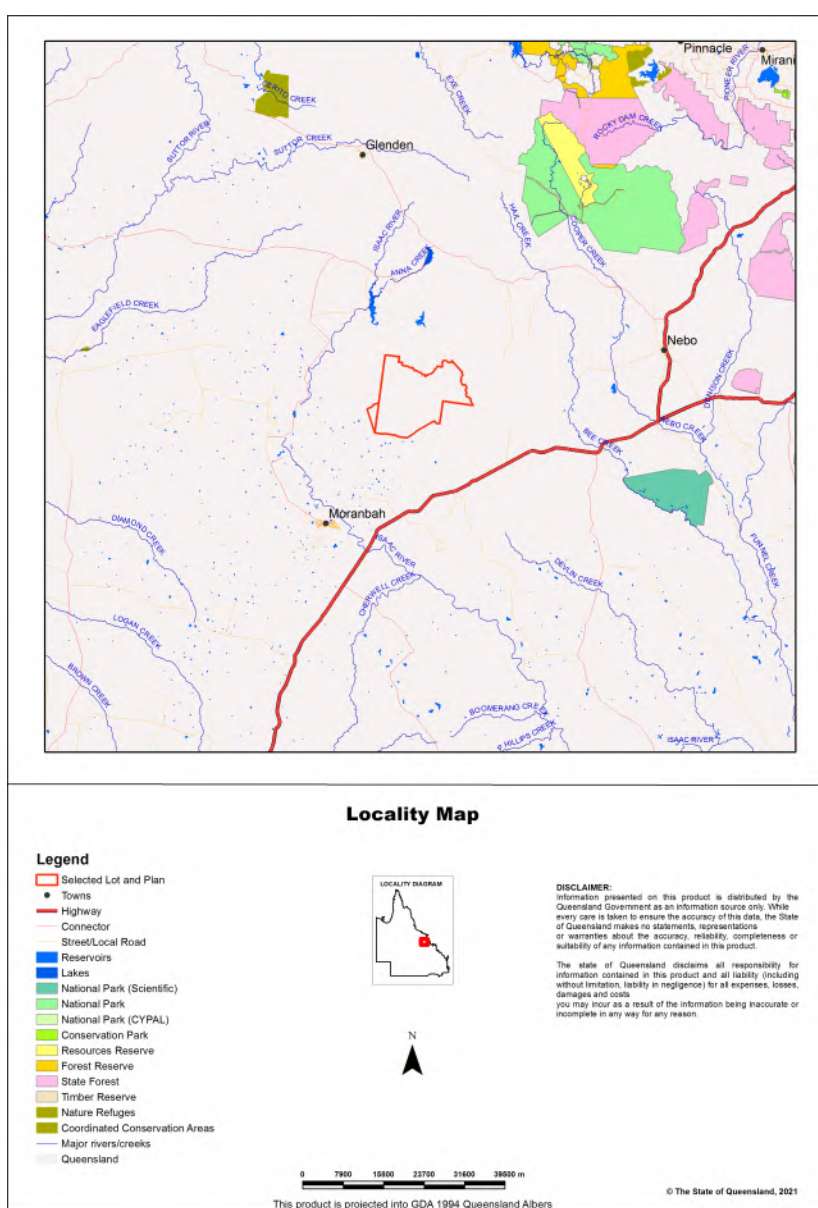
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Assessment Area Details

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 Lot: 13 Plan: SP178466

Size (ha)	19,503.06
Local Government(s)	Isaac Regional
Bioregion(s)	Brigalow Belt
Subregion(s)	Northern Bowen Basin
Catchment(s)	Fitzroy



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	2741.09 ha	14.1%
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)	1120.64 ha	5.7%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	147.16 ha	0.8%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	421.5 ha	2.2%
8d Regulated Vegetation - Essential habitat	3156.05 ha	16.2%
8e Regulated Vegetation - intersecting a watercourse **	250.0 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0.0 ha	0.0 %
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

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

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

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
<i>Petauroides volans</i>	greater glider	V	V	
<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)	V	V	

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:

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

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.9.5	E-dom	rem_end
11.9.5/11.7.2	E-dom	rem_end
11.9.5/11.5.3/11.7.2	E-dom	rem_end
11.5.3/11.4.9	E-subdom	rem_end
11.3.2/11.3.25	O-dom	rem_oc
11.3.4	O-dom	rem_oc
11.4.2	O-dom	rem_oc
11.10.8	O-dom	rem_oc
11.9.1/11.9.5	E-dom	rem_end

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

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.5.3/11.4.9	E-subdom	hvr_end
11.10.8	O-dom	hvr_oc
11.9.5	E-dom	hvr_end
11.9.5/11.7.2	E-dom	hvr_end
11.3.4	O-dom	hvr_oc

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

Regulated vegetation map category	Map number	RVM rule
R	8554	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

Not applicable

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

MSES - Offsets

9a. Legally secured offset areas - offset register areas

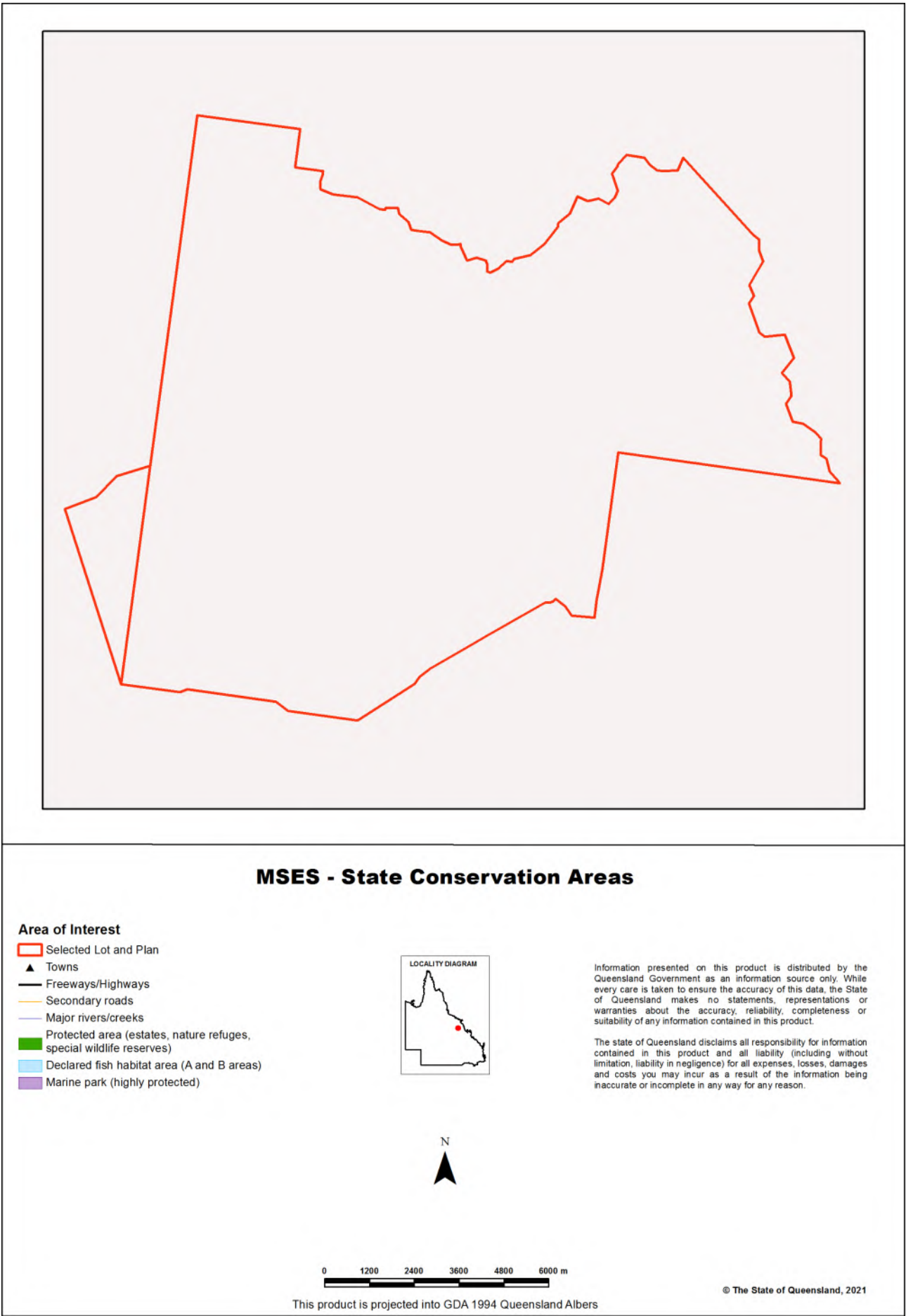
(no results)

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

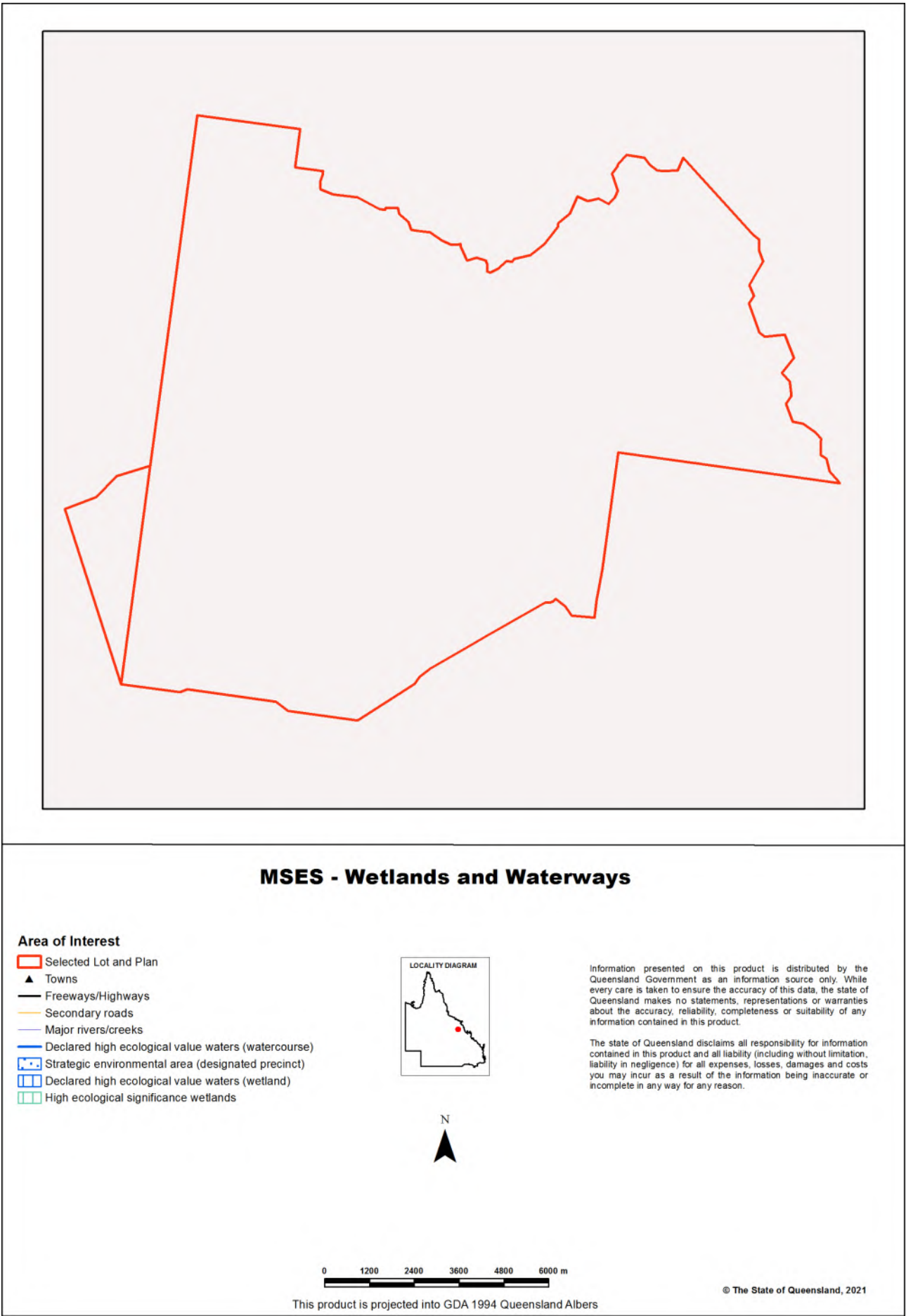
(no results)

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

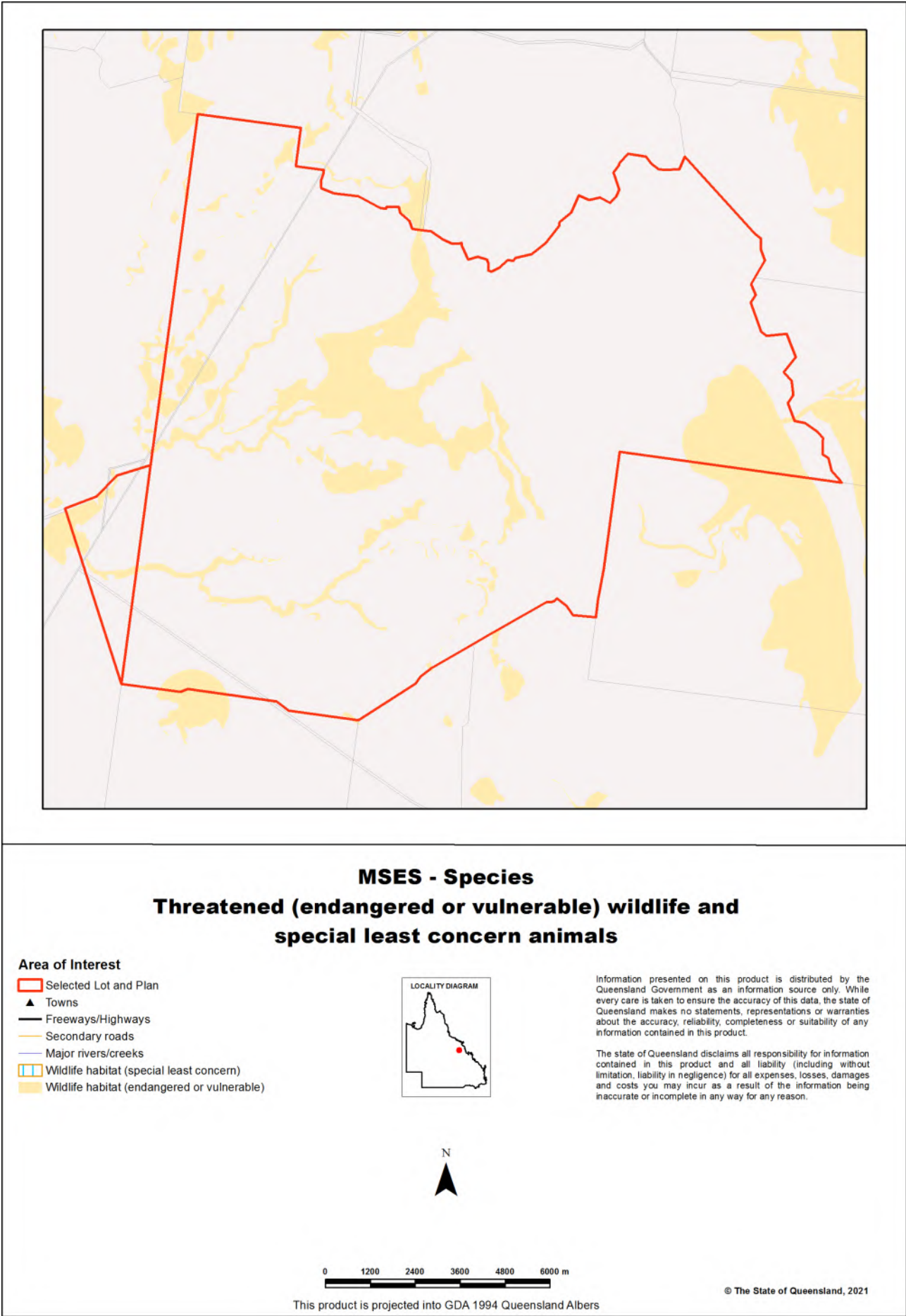
Map 1 - MSES - State Conservation Areas



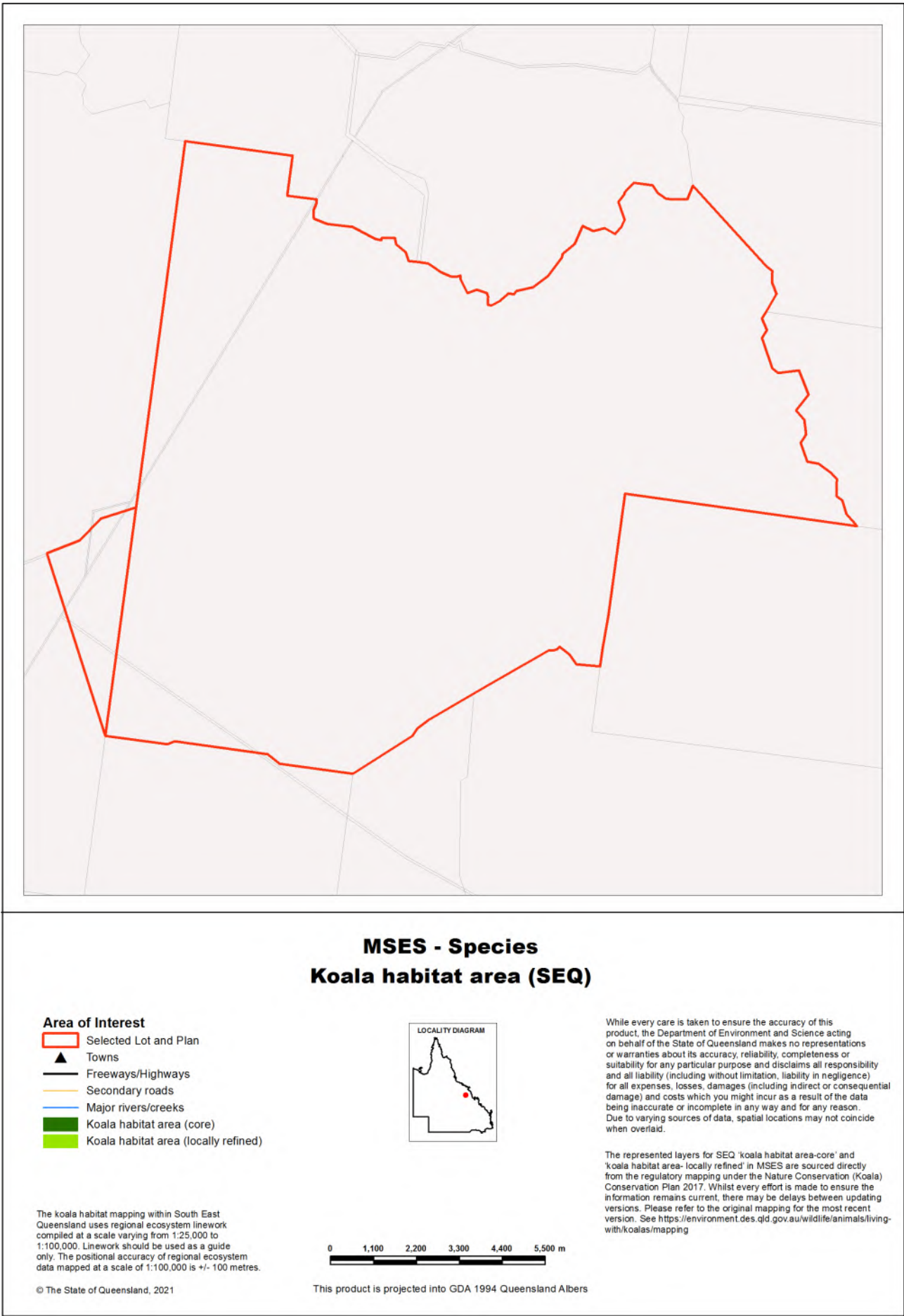
Map 2 - MSES - Wetlands and Waterways



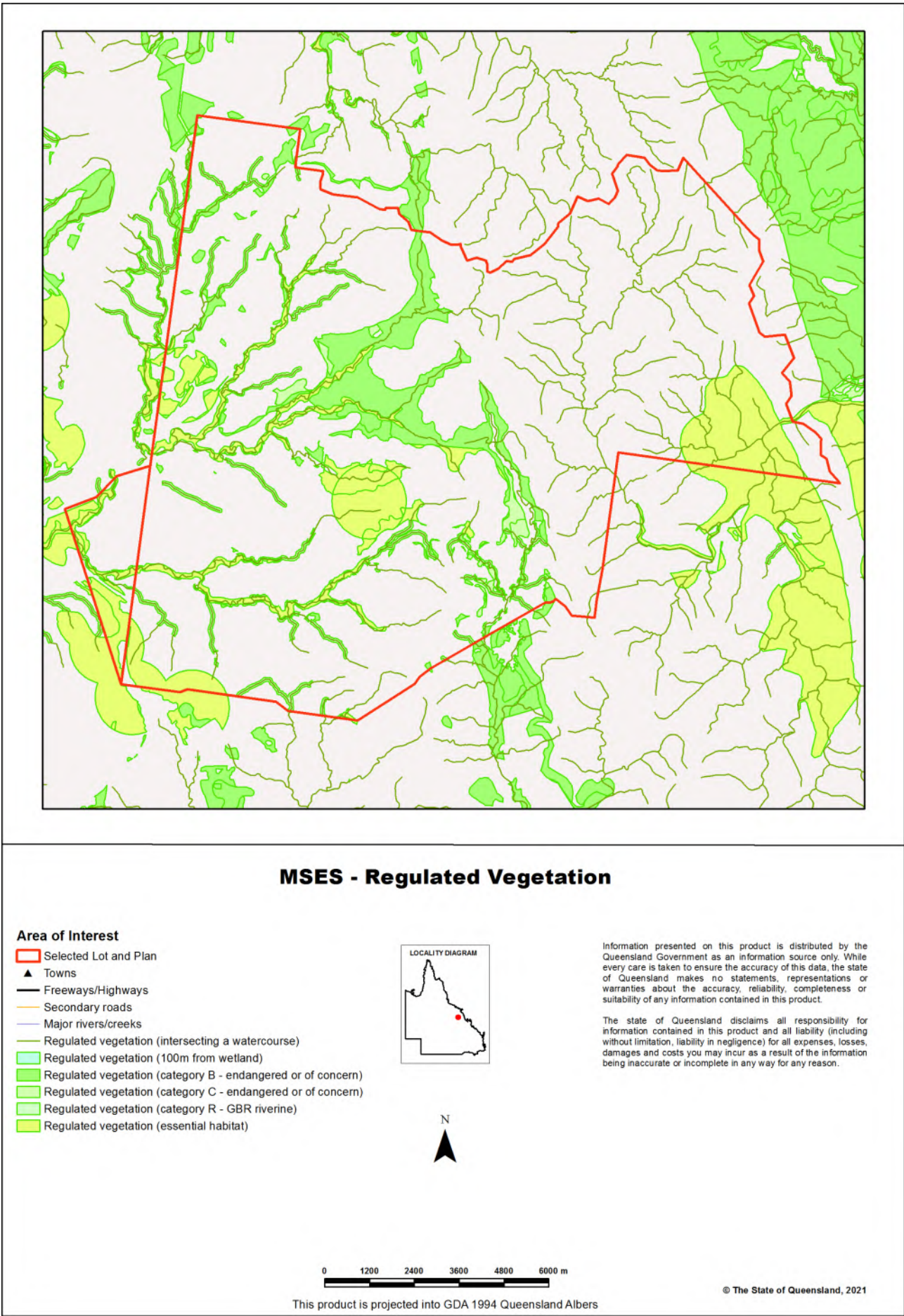
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



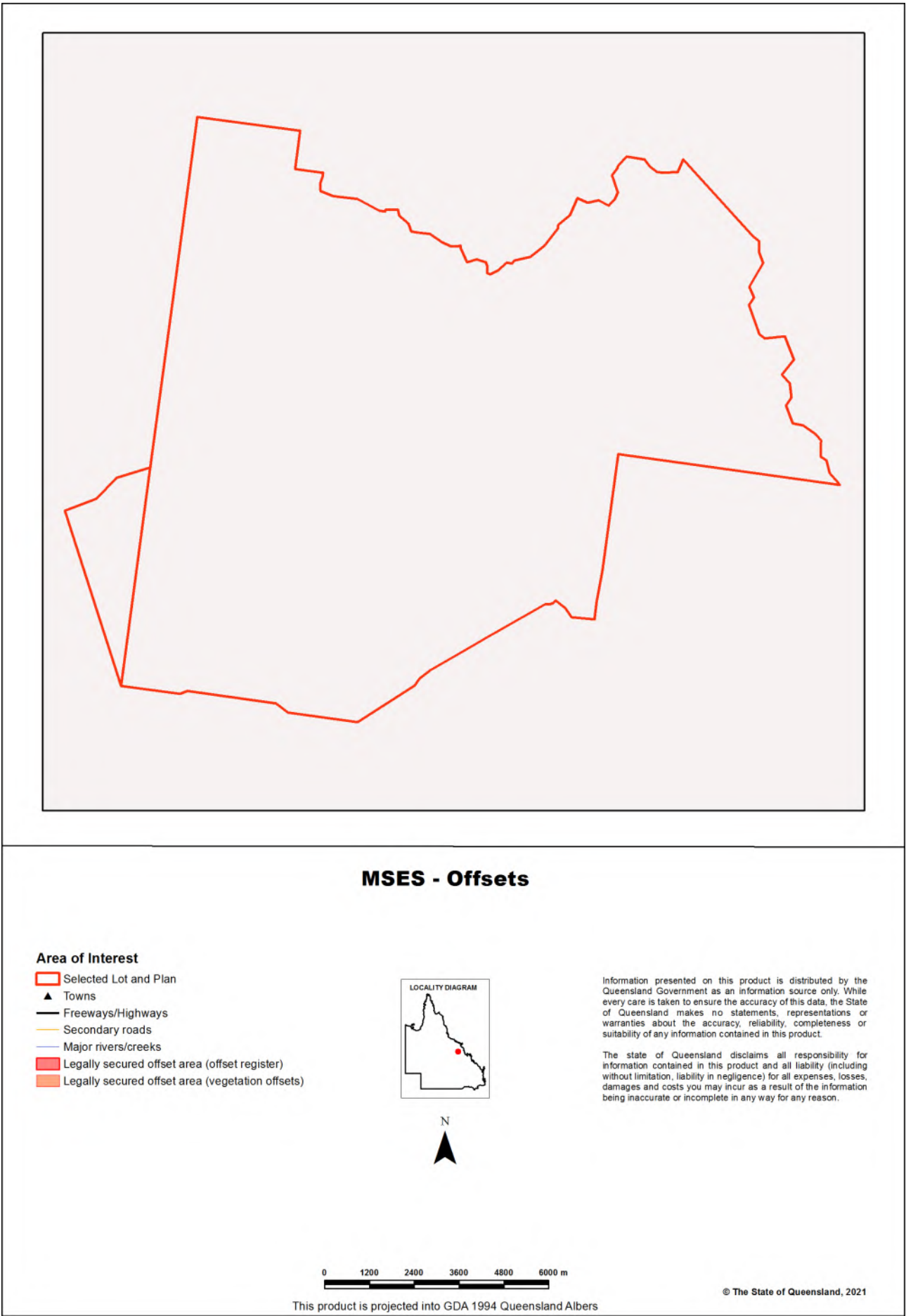
Map 3b - MSES - Species - Koala habitat area (SEQ)



Map 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	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - 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	- <i>Environmental Protection Act 1994</i>
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- <i>Nature Conservation Act 1992</i>
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- <i>Vegetation Management Act 1999</i>



Vegetation management report

For Lot: 13 Plan: SP178466

14/10/2021

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Recent changes

Updated mapping

Updated vegetation mapping was released on 8 September 2021 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, wetland, high-value regrowth and essential habitat mapping.

The Department of Environment and Science have also updated their protected plant and koala protection mapping to align with the Queensland Herbarium scientific updates.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Resources who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of Environment and Science who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:

- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 13 Plan: SP178466, are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
13	SP178466	Lands Lease	194,500,000
B	GV277	Easement	267,100
C	GV278	Easement	101,900
A	GV151	Easement	286,700
A	GV149	Easement	356,800
F	SP184907	Easement	63,100
A	GV150	Easement	21,720
D	SP184906	Easement	72,550
E	SP184908	Easement	3,405

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 13 Plan: SP178466, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Isaac Regional

Bioregion(s)	Subregion(s)
Brigalow Belt	Northern Bowen Basin

Catchment(s)
Fitzroy

2. Vegetation management framework (administered by the Department of Resources)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Resources or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Resources before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

<https://www.qld.gov.au/environment/land/vegetation/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Resources prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

<https://www.qld.gov.au/environment/land/vegetation/codes/>

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Resources before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at

<https://apps.dnrm.qld.gov.au/vegetation/>

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Resources and then follow the conditions and requirements listed in the AMP.

<https://www.qld.gov.au/environment/land/vegetation/area-plans/>

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

<https://www.qld.gov.au/environment/land/management/vegetation/development>

2.5. Contact information for the Department of Resources

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit <https://www.dnrme.qld.gov.au/?contact=vegetation> to submit an online enquiry.

3. Vegetation management framework for Lot: 13 Plan: SP178466

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 19503.04ha

Vegetation category	Area (ha)
Category A	1313.3
Category B	12460.0
Category C	283.0
Category R	421.5
Category X	5025.3

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Resources to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department of Resources to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property:

Reference number

2007/006829

Reference number

2013/002206

2013/007155

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

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

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.10.4	Least concern	B	2,677.15	Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp. woodland on coarse-grained sedimentary rocks	Sparse
11.10.4	Least concern	C	0.44	Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp. woodland on coarse-grained sedimentary rocks	Sparse
11.10.4	Least concern	R	0.07	Eucalyptus decorticans, Lysicarpus angustifolius +/- Eucalyptus spp., Corymbia spp., Acacia spp. woodland on coarse-grained sedimentary rocks	Sparse
11.10.7	Least concern	B	4,126.92	Eucalyptus crebra woodland on coarse-grained sedimentary rocks	Sparse
11.10.7	Least concern	C	0.66	Eucalyptus crebra woodland on coarse-grained sedimentary rocks	Sparse
11.10.7	Least concern	R	0.11	Eucalyptus crebra woodland on coarse-grained sedimentary rocks	Sparse
11.10.8	Of concern	B	8.51	Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks	Dense
11.10.8	Of concern	C	2.18	Semi-evergreen vine thicket in sheltered habitats on medium to coarse-grained sedimentary rocks	Dense
11.3.2	Of concern	B	2.16	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.2	Of concern	R	0.31	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.25	Least concern	B	659.26	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.25	Least concern	C	8.25	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.25	Least concern	R	27.17	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.4	Of concern	B	48.67	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.3.4	Of concern	C	2.11	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.3.4	Of concern	R	29.05	Eucalyptus tereticornis and/or Eucalyptus spp. woodland on alluvial plains	Sparse
11.4.2	Of concern	B	0.80	Eucalyptus spp. and/or Corymbia spp. grassy or shrubby woodland on Cainozoic clay plains	Sparse

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.4.9	Endangered	A	10.21	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.4.9	Endangered	B	90.19	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.4.9	Endangered	C	11.34	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.4.9	Endangered	R	6.86	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.5.15	Least concern	B	20.65	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Dense
11.5.15	Least concern	C	5.71	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Dense
11.5.15	Least concern	R	1.19	Semi-evergreen vine thicket on Cainozoic sand plains and/or remnant surfaces	Dense
11.5.2	Least concern	B	106.53	Eucalyptus crebra, Corymbia spp., with E. moluccana woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.2	Least concern	C	0.04	Eucalyptus crebra, Corymbia spp., with E. moluccana woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.2	Least concern	R	0.47	Eucalyptus crebra, Corymbia spp., with E. moluccana woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.3	Least concern	A	132.70	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.3	Least concern	B	1,198.58	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.3	Least concern	C	115.21	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.3	Least concern	R	88.92	Eucalyptus populnea +/- E. melanophloia +/- Corymbia clarksoniana woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.9	Least concern	A	5.30	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.9	Least concern	B	1,496.91	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	Sparse

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.5.9	Least concern	C	39.04	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.5.9	Least concern	R	57.30	Eucalyptus crebra and other Eucalyptus spp. and Corymbia spp. woodland on Cainozoic sand plains and/or remnant surfaces	Sparse
11.7.1	Least concern	B	9.96	Acacia harpophylla and/or Casuarina cristata and Eucalyptus thozetiana or E. microcarpa woodland on lower scarp slopes on Cainozoic lateritic duricrust	Sparse
11.7.1	Least concern	C	2.49	Acacia harpophylla and/or Casuarina cristata and Eucalyptus thozetiana or E. microcarpa woodland on lower scarp slopes on Cainozoic lateritic duricrust	Sparse
11.7.1	Least concern	R	1.17	Acacia harpophylla and/or Casuarina cristata and Eucalyptus thozetiana or E. microcarpa woodland on lower scarp slopes on Cainozoic lateritic duricrust	Sparse
11.7.2	Least concern	A	1,009.72	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Sparse
11.7.2	Least concern	B	1,816.91	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Sparse
11.7.2	Least concern	C	58.38	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Sparse
11.7.2	Least concern	R	54.77	Acacia spp. woodland on Cainozoic lateritic duricrust. Scarp retreat zone	Sparse
11.7.3	Least concern	A	56.22	Eucalyptus persistens, Triodia mitchellii open woodland on stripped margins of Cainozoic lateritic duricrust	Very sparse
11.7.3	Least concern	B	35.77	Eucalyptus persistens, Triodia mitchellii open woodland on stripped margins of Cainozoic lateritic duricrust	Very sparse
11.7.3	Least concern	C	8.12	Eucalyptus persistens, Triodia mitchellii open woodland on stripped margins of Cainozoic lateritic duricrust	Very sparse
11.7.5	Least concern	A	46.46	Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks	Sparse
11.7.5	Least concern	B	49.01	Shrubland on natural scalds on deeply weathered coarse-grained sedimentary rocks	Sparse
11.8.5	Least concern	B	0.05	Eucalyptus orgadophila open woodland on Cainozoic igneous rocks	Very sparse
11.9.1	Endangered	B	2.37	Acacia harpophylla-Eucalyptus cambageana woodland to open forest on fine-grained sedimentary rocks	Mid-dense
11.9.1	Endangered	R	18.09	Acacia harpophylla-Eucalyptus cambageana woodland to open forest on fine-grained sedimentary rocks	Mid-dense
11.9.2	Least concern	B	0.51	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Sparse

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.9.2	Least concern	R	0.10	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Sparse
11.9.3	Least concern	R	6.65	Dichanthium spp., Astrebla spp. grassland on fine-grained sedimentary rocks	Grassland Sch 4
11.9.5	Endangered	A	52.70	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
11.9.5	Endangered	B	109.01	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
11.9.5	Endangered	C	28.98	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
11.9.5	Endangered	R	121.52	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
11.9.7	Of concern	R	2.00	Eucalyptus populnea, Eremophila mitchellii shrubby woodland on fine-grained sedimentary rocks	Sparse
11.9.9	Least concern	R	5.75	Eucalyptus crebra woodland on fine-grained sedimentary rocks	Sparse
non-rem	None	X	5,025.27	None	None

Please note:

1. All area and area derived figures included in this table 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.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

- 1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.
1010	Taphozous australis	coastal sheath-tail bat	NT	All habitats within a few kilometres of coast, e.g. dune mesophyll/sclerophyll scrub, mangroves (Rhizophora, Bruguiera), heath, open forest/woodland, rainforest/monsoon forest and Melaleuca/sedge swamp, rocky escarpments ± low shrubfield.	Sea level to 150m.	None	None
1785	Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	Dry eucalypt woodland (including poplar box, spotted gum, yellow box, acacia and callitris), with sparse short grass, often on sandy areas near to permanent water; grassy eucalypt woodlands. Nest on ground near or under grass tussock, log or low bush.	None	None	Gravelly ridges, traprock and river flats.
2456	Petauroides volans minor	northern greater glider	V	Tall mature open wet and dry eucalypt forest (Eucalyptus &/or Corymbia spp.) to low open eucalypt woodland; presence of hollow-bearing trees.	Sea level to 1300m.	Usually on soils of relatively high fertility.	None
8936	Cerbera dumicola	None	NT	semi-evergreen vine thicket; low open woodland of Eucalyptus exserta; open woodland of Eucalyptus melanophloia, Acacia shirleyi, E. populnea, E. brownii; open woodland of Corymbia tessellaris, Acacia aneura; woodland of Acacia rhodoxylon; woodland to open forest of Acacia shirleyi, Corymbia dolichocarpa, or Acacia catenulata, A. shirleyi, Eucalyptus thozetiana; woodland to open forest of Corymbia citriodora, Eucalyptus fibrosa with Triodia understorey; low open forest of Acacia spp., Eucalyptus spp. On high coastal dune	0 to 600 m	sandy, sand loam to clay or hard red lateritic soil	undulating country, plateau or lateritic ridge top, rocky scarp, hill slope, coastal dune

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1, 10.9.6, 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6
1010	3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.12, 3.2.13, 3.2.14, 3.2.15, 3.2.16, 3.2.17, 3.2.18, 3.2.19, 3.2.20, 3.2.21, 3.2.22, 3.2.28, 3.2.29, 3.2.30, 3.2.31, 3.3.1, 3.3.2, 3.3.4, 3.3.5, 3.3.6, 3.3.7, 3.3.8, 3.3.9, 3.3.10, 3.3.11, 3.3.12, 3.3.13, 3.3.14, 3.3.15, 3.3.16, 3.3.17, 3.3.18, 3.3.19, 3.3.20, 3.3.21, 3.3.22, 3.3.23, 3.3.24, 3.3.25, 3.3.26, 3.3.27, 3.3.28, 3.3.29, 3.3.30, 3.3.31, 3.3.32, 3.3.33, 3.3.34, 3.3.35, 3.3.36, 3.3.37, 3.3.38, 3.3.39, 3.3.40, 3.3.41, 3.3.42, 3.3.43, 3.3.44, 3.3.45, 3.3.46, 3.3.47, 3.3.48, 3.3.49, 3.3.50, 3.3.51, 3.3.52, 3.3.53, 3.3.54, 3.3.55, 3.3.63, 3.3.67, 3.3.68, 3.3.69, 3.3.70, 3.5.1, 3.5.2, 3.5.3, 3.5.4, 3.5.5, 3.5.6, 3.5.7, 3.5.8, 3.5.9, 3.5.10, 3.5.11, 3.5.12, 3.5.13, 3.5.14, 3.5.15, 3.5.16, 3.5.17, 3.5.18, 3.5.19, 3.5.20, 3.5.21, 3.5.22, 3.5.23, 3.5.24, 3.5.25, 3.5.26, 3.5.27, 3.5.28, 3.5.31, 3.5.33, 3.5.36, 3.5.37, 3.5.38, 3.5.39, 3.5.40, 3.5.41, 3.5.42, 3.7.1, 3.7.2, 3.7.3, 3.7.4, 3.7.5, 3.7.6, 3.8.1, 3.8.2, 3.8.3, 3.8.5, 3.9.2, 3.9.4, 3.9.5, 3.9.6, 3.9.7, 3.10.1, 3.10.2, 3.10.3, 3.10.5, 3.10.6, 3.10.7, 3.10.8, 3.10.9, 3.10.10, 3.10.11, 3.10.12, 3.10.13, 3.10.14, 3.10.15, 3.10.16, 3.10.17, 3.10.18, 3.10.21, 3.11.1, 3.11.2, 3.11.3, 3.11.4, 3.11.6, 3.11.7, 3.11.8, 3.11.9, 3.11.10, 3.11.11, 3.11.12, 3.11.13, 3.11.14, 3.11.15, 3.11.17, 3.11.18, 3.11.20, 3.12.1, 3.12.2, 3.12.3, 3.12.4, 3.12.5, 3.12.6, 3.12.7, 3.12.8, 3.12.9, 3.12.10, 3.12.11, 3.12.12, 3.12.13, 3.12.14, 3.12.15, 3.12.16, 3.12.17, 3.12.18, 3.12.19, 3.12.20, 3.12.21, 3.12.22, 3.12.23, 3.12.24, 3.12.25, 3.12.26, 3.12.27, 3.12.28, 3.12.35, 3.12.39, 3.12.40, 3.12.41, 3.12.42, 3.12.43, 3.12.44, 3.12.45, 3.12.46, 3.12.47, 7.1.1, 7.1.3, 7.1.4, 7.1.5, 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, 7.2.6, 7.2.7, 7.2.8, 7.2.9, 7.2.10, 7.2.11, 7.3.3, 7.3.4, 7.3.5, 7.3.6, 7.3.7, 7.3.8, 7.3.9, 7.3.10, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.17, 7.3.19, 7.3.20, 7.3.21, 7.3.23, 7.3.25, 7.3.26, 7.3.28, 7.3.34, 7.3.35, 7.3.36, 7.3.37, 7.3.38, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.46, 7.3.47, 7.3.48, 7.3.49, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.1, 7.8.2, 7.8.3, 7.8.4, 7.8.7, 7.8.8, 7.8.10, 7.8.11, 7.8.12, 7.8.13, 7.8.14, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.1, 7.11.2, 7.11.3, 7.11.5, 7.11.6, 7.11.7, 7.11.8, 7.11.10, 7.11.12, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.23, 7.11.24, 7.11.25, 7.11.26, 7.11.27, 7.11.28, 7.11.29, 7.11.30, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.36, 7.11.37, 7.11.38, 7.11.40, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.1, 7.12.2, 7.12.4, 7.12.5, 7.12.6, 7.12.7, 7.12.9, 7.12.10, 7.12.11, 7.12.12, 7.12.13, 7.12.16, 7.12.17, 7.12.19, 7.12.20, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.37, 7.12.38, 7.12.39, 7.12.40, 7.12.41, 7.12.42, 7.12.43, 7.12.44, 7.12.45, 7.12.46, 7.12.47, 7.12.48, 7.12.49, 7.12.50, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.57, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.64, 7.12.65, 7.12.66, 7.12.68, 7.12.69, 8.1.5, 8.2.1, 8.2.2, 8.2.3, 8.2.4, 8.2.5, 8.2.6, 8.2.7, 8.2.8, 8.2.11, 8.2.12, 8.2.13, 8.2.14, 8.3.1, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.8, 8.3.9, 8.3.10, 8.3.11, 8.3.13, 8.5.1, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.8.1, 8.9.1, 8.11.1, 8.11.2, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.11.10, 8.11.12, 8.12.1, 8.12.2, 8.12.3, 8.12.4, 8.12.5, 8.12.6, 8.12.7, 8.12.8, 8.12.9, 8.12.10, 8.12.11, 8.12.12, 8.12.13, 8.12.14, 8.12.16, 8.12.17, 8.12.18, 8.12.19, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 8.12.26, 8.12.27, 8.12.28, 8.12.29, 8.12.30, 8.12.31, 8.12.32, 11.1.4, 11.2.1, 11.2.2, 11.2.3, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.5, 11.3.6, 11.3.7, 11.3.8, 11.3.9, 11.3.10, 11.3.11, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.20, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 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1785	8.2.1, 8.2.7, 8.2.8, 8.2.12, 8.3.2, 8.3.3, 8.3.5, 8.3.6, 8.3.13, 8.5.2, 8.5.3, 8.5.5, 8.5.6, 8.9.1, 8.11.1, 8.11.3, 8.11.4, 8.11.5, 8.11.6, 8.11.8, 8.12.6, 8.12.7, 8.12.9, 8.12.12, 8.12.14, 8.12.20, 8.12.22, 8.12.23, 8.12.25, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.9, 9.3.11, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.18, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.23, 9.4.1, 9.4.2, 9.4.3, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.16, 9.7.1, 9.7.2, 9.7.3, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.6, 9.8.9, 9.8.10, 9.8.11, 9.10.1, 9.10.3, 9.10.6, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.11, 9.11.12, 9.11.13, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.23, 9.11.26, 9.11.28, 9.11.29, 9.11.31, 9.11.32, 9.12.1, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.26, 9.12.28, 9.12.30, 9.12.31, 9.12.33, 9.12.35, 9.12.37, 9.12.39, 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.19, 10.3.20, 10.3.27, 10.3.28, 10.3.30, 10.3.31, 10.4.3, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.7, 10.5.9, 10.5.10, 10.5.11, 10.5.12, 10.7.2, 10.7.3, 10.7.5, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, 10.10.7, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.7, 11.3.8, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.2, 11.9.3, 11.9.7, 11.9.9, 11.9.14, 11.10.1, 11.10.4, 11.10.6, 11.10.7, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.15, 11.11.16, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.11, 11.12.12, 11.12.13, 11.12.14, 11.12.17, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.10, 12.2.11, 12.3.3, 12.3.6, 12.3.10, 12.3.12, 12.3.14, 12.3.18, 12.3.19, 12.5.1, 12.5.2, 12.5.4, 12.5.5, 12.5.7, 12.5.8, 12.5.11, 12.5.12, 12.7.1, 12.7.2, 12.8.14, 12.8.16, 12.8.17, 12.8.19, 12.9.10.5, 12.9.10.7, 12.9.10.8, 12.9.10.12, 12.9.10.13, 12.9.10.25, 12.9.10.26, 12.9.10.28, 12.11.5, 12.11.7, 12.11.8, 12.11.14, 12.11.15, 12.11.20, 12.11.21, 12.11.22, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.7, 12.12.8, 12.12.9, 12.12.12, 12.12.14, 12.12.21, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.27, 13.3.1, 13.3.4, 13.3.7, 13.11.1, 13.11.3, 13.11.4, 13.11.8, 13.12.2, 13.12.3, 13.12.5, 13.12.8, 13.12.9, 13.12.10

Label	Regional Ecosystem (mandatory unless otherwise specified)
2456	7.3.7, 7.3.8, 7.3.9, 7.3.12, 7.3.13, 7.3.14, 7.3.16, 7.3.19, 7.3.20, 7.3.21, 7.3.25, 7.3.26, 7.3.39, 7.3.40, 7.3.42, 7.3.43, 7.3.44, 7.3.45, 7.3.47, 7.3.48, 7.3.50, 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.8.7, 7.8.8, 7.8.10, 7.8.15, 7.8.16, 7.8.17, 7.8.18, 7.8.19, 7.11.5, 7.11.6, 7.11.13, 7.11.14, 7.11.16, 7.11.18, 7.11.19, 7.11.20, 7.11.21, 7.11.31, 7.11.32, 7.11.33, 7.11.34, 7.11.35, 7.11.37, 7.11.38, 7.11.41, 7.11.42, 7.11.43, 7.11.44, 7.11.45, 7.11.46, 7.11.47, 7.11.48, 7.11.49, 7.11.50, 7.11.51, 7.12.4, 7.12.5, 7.12.17, 7.12.21, 7.12.22, 7.12.23, 7.12.24, 7.12.25, 7.12.26, 7.12.27, 7.12.28, 7.12.29, 7.12.30, 7.12.33, 7.12.34, 7.12.35, 7.12.51, 7.12.52, 7.12.53, 7.12.54, 7.12.55, 7.12.56, 7.12.58, 7.12.59, 7.12.60, 7.12.61, 7.12.62, 7.12.63, 7.12.65, 7.12.66, 7.12.69, 9.3.1, 9.3.2, 9.3.3, 9.3.5, 9.3.6, 9.3.8, 9.3.10, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.19, 9.3.20, 9.3.21, 9.3.22, 9.3.24, 9.4.1, 9.4.2, 9.5.1, 9.5.3, 9.5.4, 9.5.5, 9.5.6, 9.5.7, 9.5.8, 9.5.9, 9.5.10, 9.5.11, 9.5.12, 9.5.13, 9.5.14, 9.5.15, 9.5.16, 9.5.17, 9.7.1, 9.7.2, 9.7.3, 9.7.4, 9.7.5, 9.7.6, 9.8.1, 9.8.2, 9.8.4, 9.8.5, 9.8.9, 9.8.10, 9.8.11, 9.10.1, 9.10.3, 9.10.4, 9.10.5, 9.10.7, 9.10.8, 9.11.1, 9.11.2, 9.11.3, 9.11.4, 9.11.5, 9.11.7, 9.11.10, 9.11.12, 9.11.13, 9.11.14, 9.11.15, 9.11.16, 9.11.17, 9.11.18, 9.11.19, 9.11.21, 9.11.22, 9.11.23, 9.11.24, 9.11.25, 9.11.26, 9.11.28, 9.11.29, 9.11.30, 9.11.31, 9.11.32, 9.12.1, 9.12.2, 9.12.3, 9.12.4, 9.12.5, 9.12.6, 9.12.7, 9.12.10, 9.12.11, 9.12.12, 9.12.13, 9.12.14, 9.12.15, 9.12.16, 9.12.17, 9.12.18, 9.12.19, 9.12.20, 9.12.21, 9.12.22, 9.12.23, 9.12.24, 9.12.25, 9.12.26, 9.12.27, 9.12.28, 9.12.29, 9.12.30, 9.12.31, 9.12.32, 9.12.33, 9.12.35, 9.12.36, 9.12.37, 9.12.38, 9.12.39, 9.12.40, 9.12.44, 10.3.2, 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.12, 11.3.13, 11.3.14, 11.3.15, 11.3.16, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.7, 11.4.8, 11.4.10, 11.4.12, 11.4.13, 11.5.1, 11.5.2, 11.5.3, 11.5.4, 11.5.5, 11.5.7, 11.5.8, 11.5.9, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.20, 11.7.1, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.15, 11.11.16, 11.11.19, 11.11.20, 11.12.1, 11.12.2, 11.12.3, 11.12.5, 11.12.6, 11.12.7, 11.12.8, 11.12.9, 11.12.10, 11.12.11, 11.12.13, 11.12.14, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.10, 12.2.11, 12.3.2, 12.3.3, 12.3.4, 12.3.5, 12.3.6, 12.3.7, 12.3.9, 12.3.10, 12.3.11, 12.3.12, 12.3.14, 12.3.15, 12.3.18, 12.3.19, 12.3.20, 12.5.1, 12.5.2, 12.5.3, 12.5.4, 12.5.5, 12.5.6, 12.5.7, 12.5.8, 12.5.10, 12.5.11, 12.5.12, 12.7.1, 12.7.2, 12.8.1, 12.8.2, 12.8.8, 12.8.10, 12.8.11, 12.8.12, 12.8.14, 12.8.16, 12.8.17, 12.8.20, 12.8.23, 12.8.24, 12.8.25, 12.8.26, 12.9-10.1, 12.9-10.2, 12.9-10.3, 12.9-10.4, 12.9-10.5, 12.9-10.7, 12.9-10.8, 12.9-10.11, 12.9-10.12, 12.9-10.13, 12.9-10.14, 12.9-10.17, 12.9-10.18, 12.9-10.19, 12.9-10.20, 12.9-10.21, 12.9-10.23, 12.9-10.24, 12.9-10.25, 12.9-10.26, 12.9-10.27, 12.9-10.28, 12.9-10.29, 12.11.2, 12.11.3, 12.11.5, 12.11.6, 12.11.7, 12.11.8, 12.11.9, 12.11.14, 12.11.15, 12.11.16, 12.11.17, 12.11.18, 12.11.19, 12.11.20, 12.11.21, 12.11.22, 12.11.23, 12.11.24, 12.11.25, 12.11.26, 12.11.27, 12.11.28, 12.12.2, 12.12.3, 12.12.4, 12.12.5, 12.12.6, 12.12.7, 12.12.8, 12.12.9, 12.12.11, 12.12.12, 12.12.14, 12.12.15, 12.12.20, 12.12.21, 12.12.22, 12.12.23, 12.12.24, 12.12.25, 12.12.26, 12.12.27, 12.12.28, 13.3.1, 13.3.2, 13.3.3, 13.3.4, 13.3.5, 13.3.7, 13.9.2, 13.11.1, 13.11.2, 13.11.3, 13.11.4, 13.11.5, 13.11.6, 13.11.8, 13.11.9, 13.12.1, 13.12.2, 13.12.3, 13.12.4, 13.12.5, 13.12.6, 13.12.8, 13.12.9, 13.12.10
8936	6.5.9, 8.12.5, 8.12.10, 8.12.14, 9.7.2, 10.5.5, 10.5.12, 10.7.3, 10.10.4, 11.5.2, 11.5.9, 11.7.2, 11.9.4, 11.10.1, 11.10.2, 11.10.3, 11.10.8, 11.11.2, 11.11.7, 11.12.1

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:

<https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new [property maps of assessable vegetation \(PMAV\)](#).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

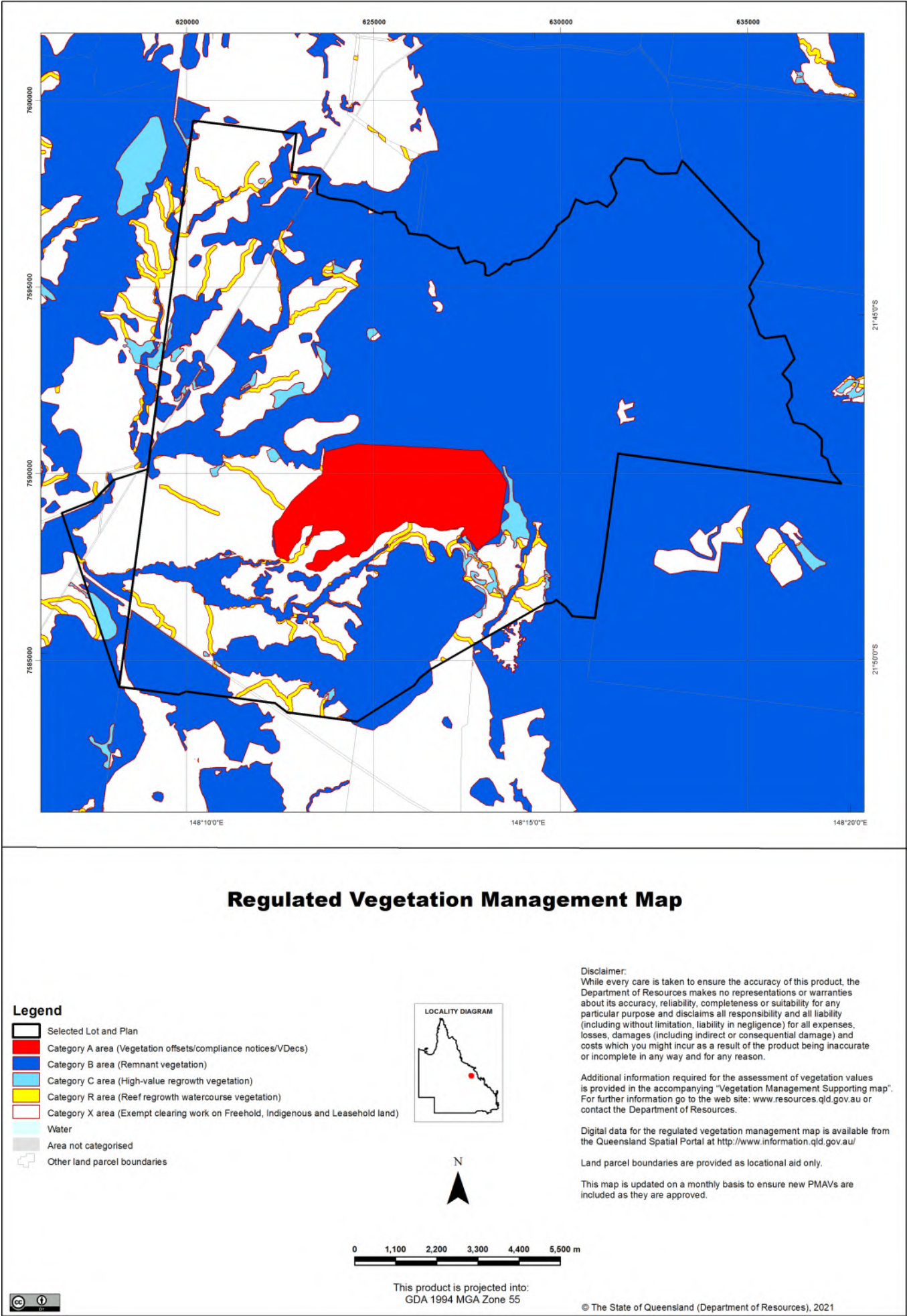
Coastal/non-coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

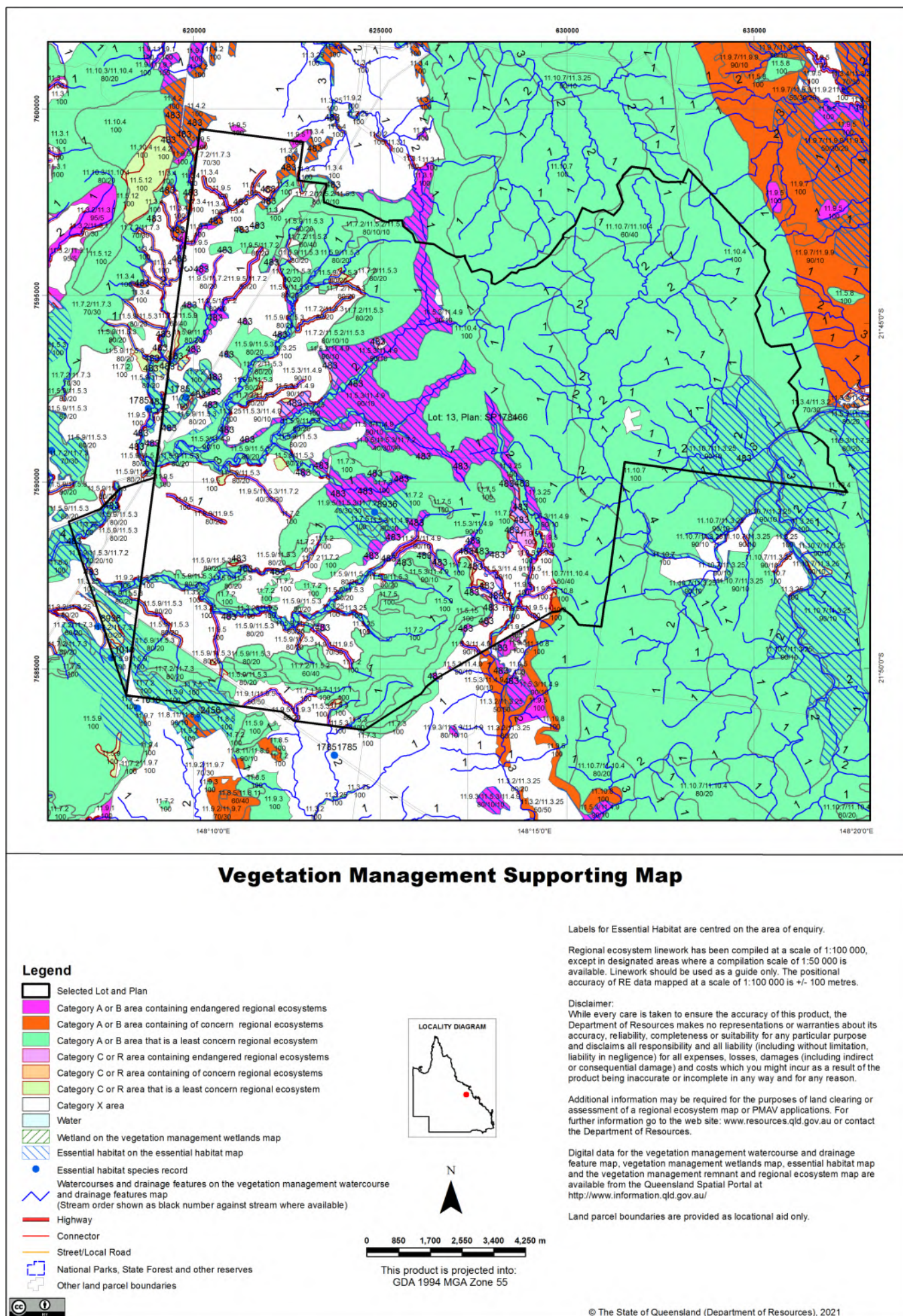
Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

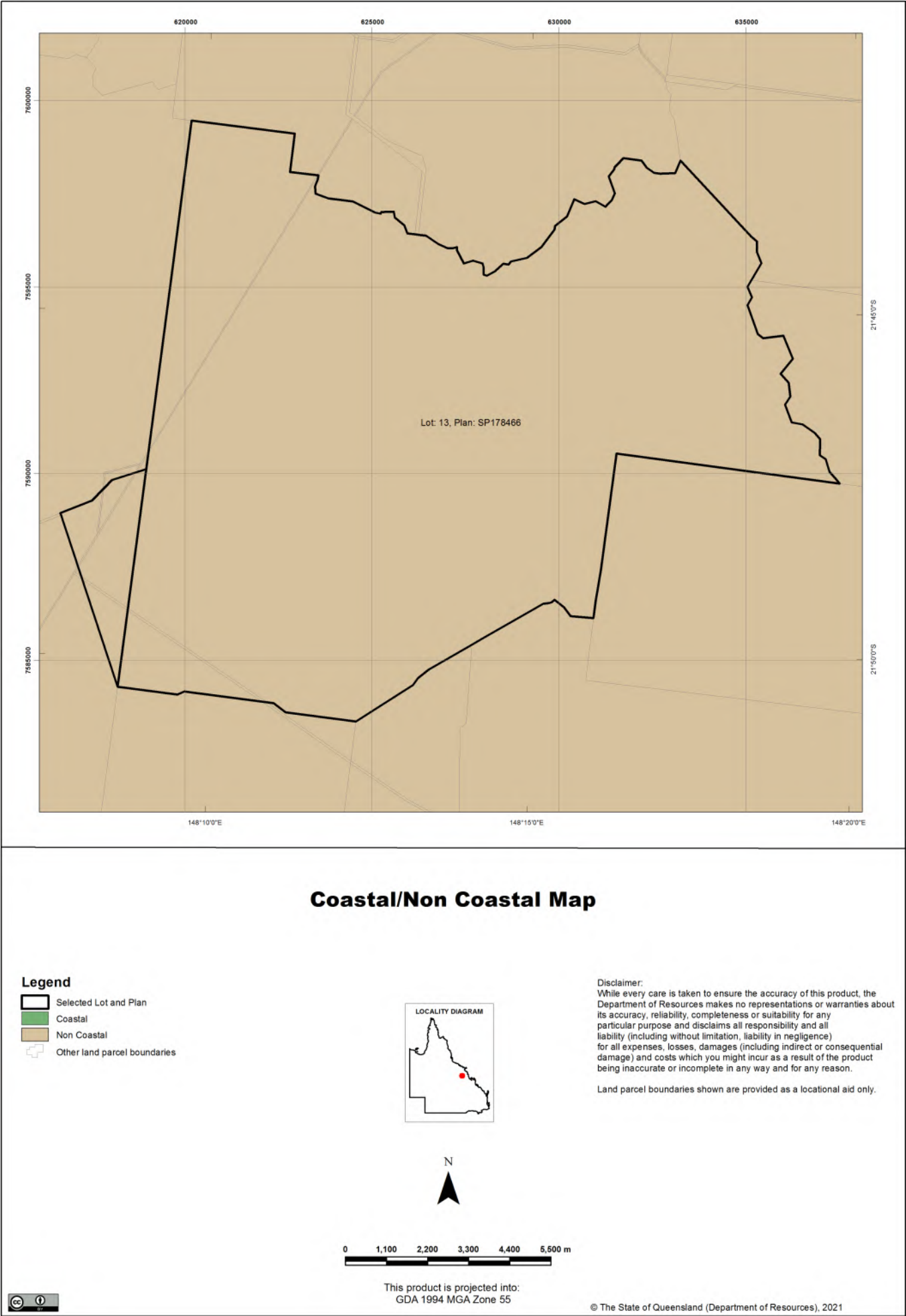
4.1 Regulated vegetation management map



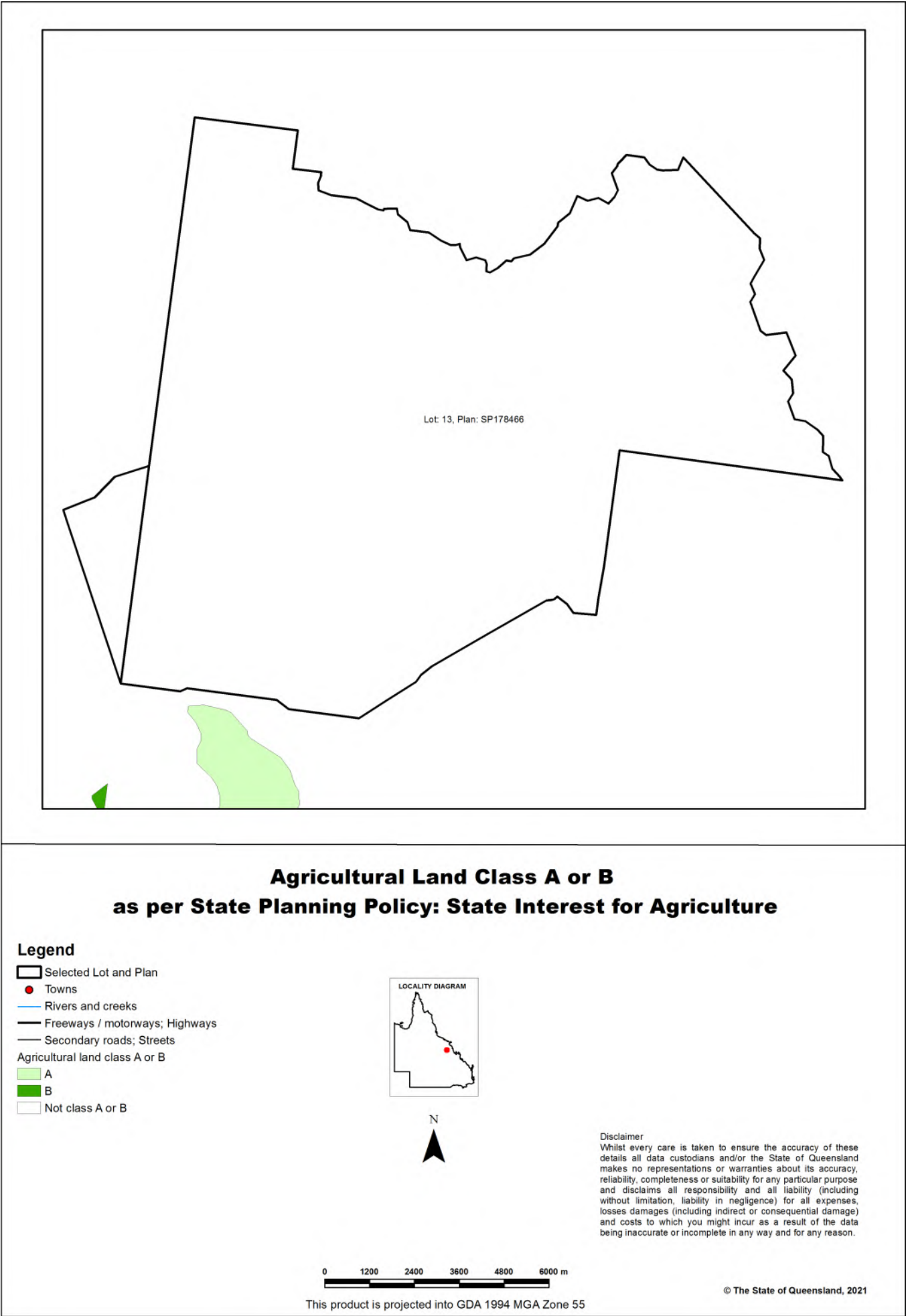
4.2 Vegetation management supporting map



4.3 Coastal/non-coastal map



4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](#) (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for endangered, vulnerable or near threatened (EVNT) plants. These are areas where EVNT plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the [Flora survey guidelines](#). The main objective of a flora survey is to locate any EVNT plants that may be present in the clearing impact area.

If the flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An [exempt clearing notification form](#) must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the [clearing permit application form](#).

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DES

For further information on the protected plants framework:

Phone 1300 130 372 (and select option four)

Email palm@des.qld.gov.au

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

5.5 Protected plants flora survey trigger map

This map included may also be requested individually at: <https://apps.des.qld.gov.au/map-request/flora-survey-trigger/>.

Updates to the data informing the flora survey trigger map

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

Species information

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



Protected Plants Flora Survey Trigger Map

Legend

- Selected Lot and Plan
- High risk area
- Other land parcel boundaries
- Freeways / motorways / highways
- Secondary roads / streets



0 820 1,640 2,460 3,280 4,100 m

This product is projected into:
GDA 1994 MGA Zone 55

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

Land parcel boundaries are provided as locational aid only.

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

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

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

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6. Koala protection framework (administered by the Department of Environment and Science (DES))

The koala (*Phascolarctos cinereus*) is listed in Queensland as vulnerable by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document [Spatial modelling in South East Queensland](#).

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document [Guideline - Requests to make, amend or revoke a koala habitat area determination](#).

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps>. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley,

Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

- 1) Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
- 2) Does not include destroying standing vegetation by stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the [Planning Regulation 2017](#). More information on exempted development can be found here:

<https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy>.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:
 - the local government planning scheme makes the development assessable;
 - the premises includes an area that is both a koala priority area and a koala habitat area; and
 - the development does not involve interfering with koala habitat (defined above); and
- development in identified koala broad-hectare areas.

The [Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks](#) outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the [Nature Conservation \(Koala\) Conservation Plan 2017](#) prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DES

For further information on the koala protection framework:

Phone 13 QGOV (13 74 68)

Email koala.assessment@des.qld.gov.au

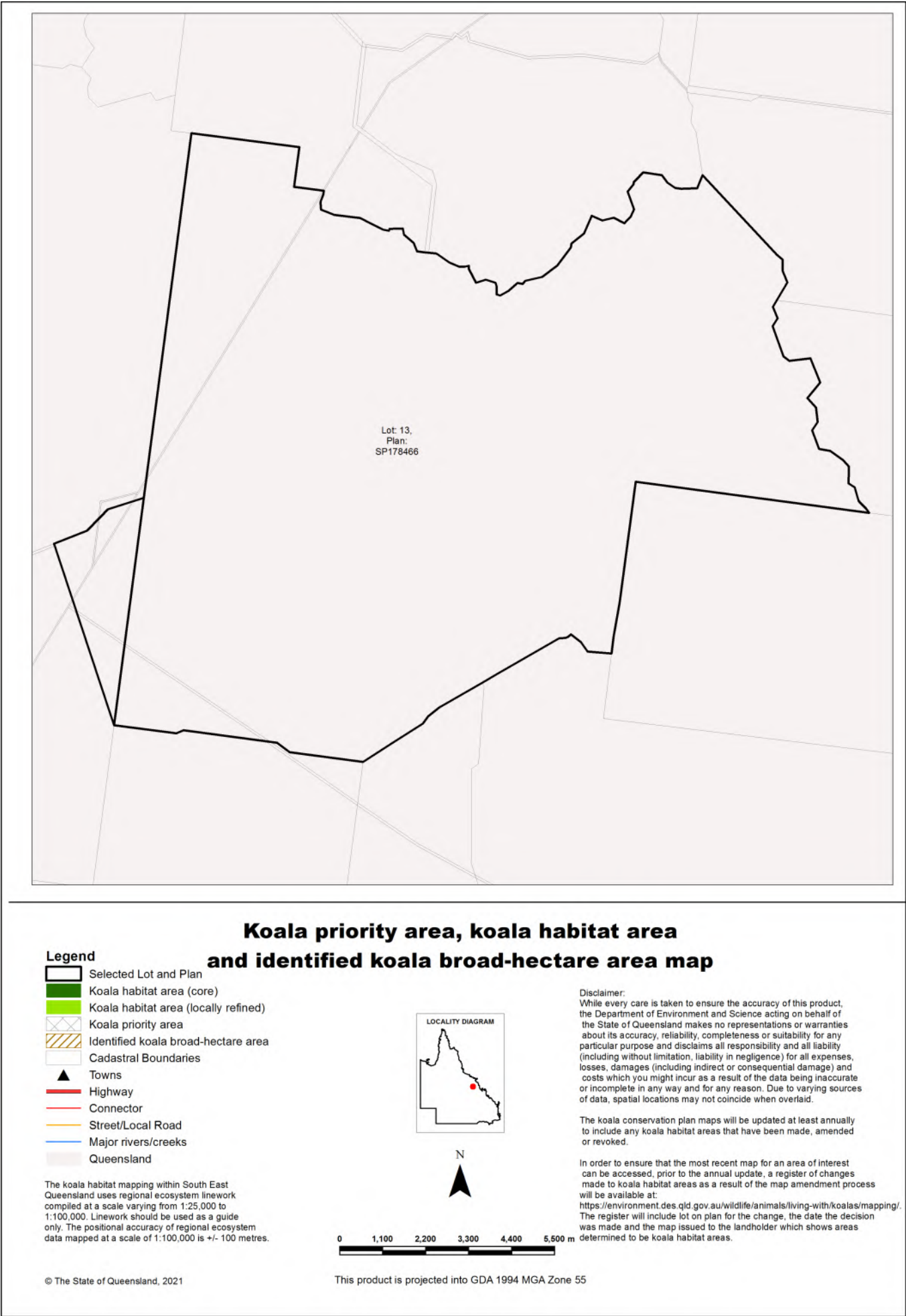
Visit <https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping>

7. Koala protection framework details for Lot: 13 Plan: SP178466

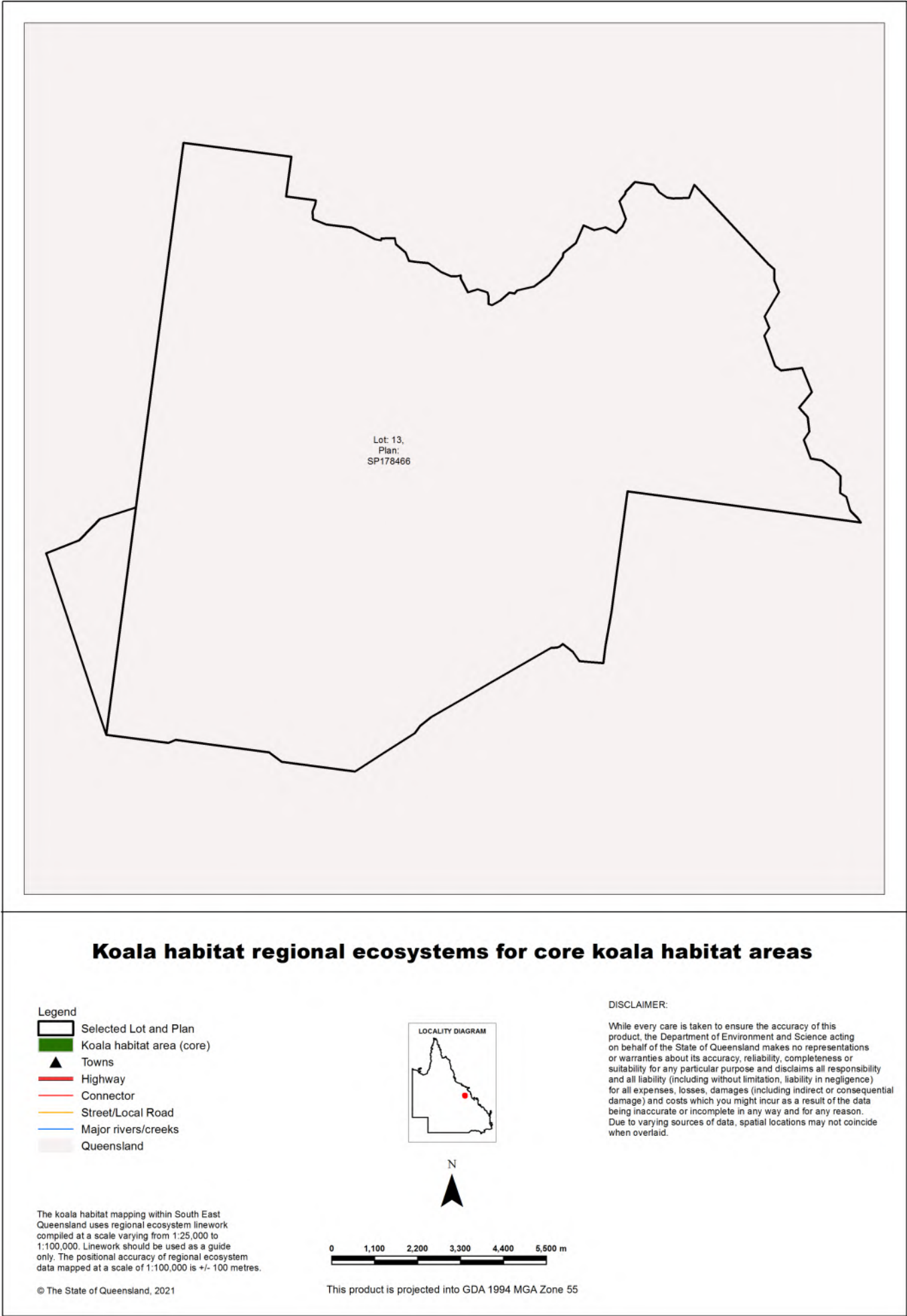
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare area map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Regional Development, Manufacturing and Water (Queensland Government) Department of Resources (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Protected plants and protected areas	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 1300 130 372 (option 4) palm@des.qld.gov.au www.des.qld.gov.au
• Koala mapping and regulations	<i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) Koala.assessment@des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities on State land tenures	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of Agriculture, Water and the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Department of State Development, Infrastructure, Local Government and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office
• Harvesting timber in the Wet Tropics of Qld World Heritage area	<i>Wet Tropics World Heritage Protection and Management Act 1993</i>	Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -21.7771
Longitude: 148.2147
Distance: 20
Email: emily.drummond@e2mconsulting.com.au
Date submitted: Friday 07 May 2021 09:48:27
Date extracted: Friday 07 May 2021 09:50:01

The number of records retrieved = 564

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.

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			25
animals	amphibians	Hylidae	<i>Litoria rothii</i>	northern laughing treefrog		C		2
animals	amphibians	Hylidae	<i>Litoria inermis</i>	bumpy rocketfrog		C		5
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		5
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		11
animals	amphibians	Hylidae	<i>Cyclorana brevipes</i>	superb collared frog		C		3
animals	amphibians	Hylidae	<i>Cyclorana alboguttata</i>	greenstripe frog		C		6
animals	amphibians	Hylidae	<i>Cyclorana novaehollandiae</i>	eastern snapping frog		C		5
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		1
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		7
animals	amphibians	Limnodynastidae	<i>Limnodynastes salmini</i>	salmon striped frog		C		2
animals	amphibians	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog		C		39
animals	amphibians	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog		C		8
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		6
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		1
animals	birds	Acanthizidae	<i>Gerygone fusca</i>	western gerygone		C		1
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		34
animals	birds	Acanthizidae	<i>Acanthiza apicalis</i>	inland thornbill		C		4
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		6
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		4
animals	birds	Acanthizidae	<i>Pyrrholaemus sagittatus</i>	speckled warbler		C		9
animals	birds	Acanthizidae	<i>Smicronis brevirostris</i>	weebill		C		126
animals	birds	Acanthizidae	<i>Acanthiza nana</i>	yellow thornbill		C		3
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		1
animals	birds	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk		C		2
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		18
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		1
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		3
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		11
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		1
animals	birds	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler		C		1
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		12
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		2
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		8
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		11
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		8
animals	birds	Anatidae	<i>Cygnus atratus</i>	black swan		C		2
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		7
animals	birds	Anatidae	<i>Malacorhynchus membranaceus</i>	pink-eared duck		C		2
animals	birds	Anatidae	<i>Nettapus coromandelianus</i>	cotton pygmy-goose		C		4
animals	birds	Anatidae	<i>Spatula rhynchotis</i>	Australasian shoveler		C		1
animals	birds	Anatidae	<i>Dendrocygna arcuata</i>	wandering whistling-duck		C		1
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		4
animals	birds	Ardeidae	<i>Bubulcus ibis</i>	cattle egret		C		1
animals	birds	Ardeidae	<i>Ardea pacifica</i>	white-necked heron		C		5
animals	birds	Ardeidae	<i>Ardea intermedia</i>	intermediate egret		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret		C		7
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		7
animals	birds	Artamidae	<i>Artamus cinereus</i>	black-faced woodswallow		C		2
animals	birds	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		85
animals	birds	Artamidae	<i>Strepera graculina</i>	pied currawong		C		61
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		79
animals	birds	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow		C		8
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		113
animals	birds	Artamidae	<i>Artamus minor</i>	little woodswallow		C		1
animals	birds	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew		C		2
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		23
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		52
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		1
animals	birds	Campephagidae	<i>Lalage tricolor</i>	white-winged triller		C		16
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		53
animals	birds	Campephagidae	<i>Coracina tenuirostris</i>	cicadabird		C		35
animals	birds	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike		C		8
animals	birds	Casuariidae	<i>Dromaius novaehollandiae</i>	emu		C		5
animals	birds	Charadriidae	<i>Vanellus miles</i>	masked lapwing		C		2
animals	birds	Charadriidae	<i>Elseya melanops</i>	black-fronted dotterel		C		3
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		1
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		C		2
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		5
animals	birds	Columbidae	<i>Geophaps scripta scripta</i>	squatter pigeon (southern subspecies)		V	V	34
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		7
animals	birds	Columbidae	<i>Phaps chalcoptera</i>	common bronzewing		C		1
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		22
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		7
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		46
animals	birds	Corcoracidae	<i>Struthidea cinerea</i>	apostlebird		C		31
animals	birds	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough		C		7
animals	birds	Corvidae	<i>Corvus bennetti</i>	little crow		C		1
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		166
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		2
animals	birds	Cuculidae	<i>Eudynamis orientalis</i>	eastern koel		C		5
animals	birds	Cuculidae	<i>Chalcites minutillius</i>	little bronze-cuckoo		C		4
animals	birds	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo		C		5
animals	birds	Cuculidae	<i>Chalcites minutillius barnardi</i>	Eastern little bronze-cuckoo		C		2
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		5
animals	birds	Cuculidae	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo		C		4
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		12
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		23
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		6
animals	birds	Cuculidae	<i>Chalcites osculans</i>	black-eared cuckoo		C		1
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		15
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		27
animals	birds	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar		C		3
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		8
animals	birds	Falconidae	<i>Falco longipennis</i>	Australian hobby		C		1
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		10
animals	birds	Gruidae	<i>Antigone rubicunda</i>	brolga		C		7
animals	birds	Halcyonidae	<i>Dacelo leachii</i>	blue-winged kookaburra		C		12
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		63
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		16
animals	birds	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher		C		8
animals	birds	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher		C		2
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		2
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		5
animals	birds	Jacanidae	<i>Irediparra gallinacea</i>	comb-crested jacana		C		2
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		19
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		34
animals	birds	Megapodiidae	<i>Alectura lathami</i>	Australian brush-turkey		C		4
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		20
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		21
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		57
animals	birds	Meliphagidae	<i>Manorina flavigula</i>	yellow-throated miner		C		23
animals	birds	Meliphagidae	<i>Gavicalis virescens</i>	singing honeyeater		C		23
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		14
animals	birds	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		91
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		14
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		65
animals	birds	Meliphagidae	<i>Acanthagenys rufogularis</i>	spiny-cheeked honeyeater		C		1
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		84
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		61
animals	birds	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch		SL		1
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		29
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		23
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		2
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		51
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		20
animals	birds	Oriolidae	<i>Sphecotheres vieillotii</i>	Australasian figbird		C		10
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		13
animals	birds	Otididae	<i>Ardeotis australis</i>	Australian bustard		C		9
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		23
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		45
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		1
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		101
animals	birds	Petroicidae	<i>Microeca fascians</i>	jacky winter		C		2
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		7
animals	birds	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		1
animals	birds	Phasianidae	<i>Coturnix sp.</i>			C		1
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		13
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		6
animals	birds	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		41
animals	birds	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot		C		37
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		57
animals	birds	Psittacidae	<i>Platycercus adscitus palliceps</i>	pale-headed rosella (southern form)		C		2
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		69
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus maculatus</i>	spotted bowerbird		C		4
animals	birds	Rallidae	<i>Fulica atra</i>	Eurasian coot		C		5
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		4
animals	birds	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		2
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		2
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		26
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		12
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		12
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		1
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		2
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		1
animals	birds	Turnicidae	<i>Turnix varius</i>	painted button-quail		C		3
animals	birds	Tytonidae	<i>Tyto delicatula</i>	eastern barn owl		C		1
animals	insects	Nymphalidae	<i>Melanitis leda bankia</i>	evening brown				1
animals	insects	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing				1
animals	insects	Nymphalidae	<i>Junonia orithya albicincta</i>	blue argus				2
animals	insects	Nymphalidae	<i>Junonia villida villida</i>	meadow argus				4
animals	insects	Nymphalidae	<i>Tirumala hamata hamata</i>	blue tiger				1
animals	insects	Nymphalidae	<i>Euploea corinna</i>	common crow				4
animals	insects	Nymphalidae	<i>Danaus petilia</i>	lesser wanderer				1
animals	insects	Papilionidae	<i>Papilio anactus</i>	dainty swallowtail				2
animals	insects	Papilionidae	<i>Cressida cressida cressida</i>	clearwing swallowtail				1
animals	insects	Pieridae	<i>Belenois java teutonia</i>	caper white				4
animals	insects	Pieridae	<i>Catopsilia pomona</i>	lemon migrant				4
animals	insects	Pieridae	<i>Elodina parthia</i>	striated pearl-white				1
animals	insects	Pieridae	<i>Eurema smilax</i>	small grass-yellow				1
animals	mammals	Canidae	<i>Canis sp.</i>		Y			16
animals	mammals	Canidae	<i>Canis familiaris (dingo)</i>	dingo				1
animals	mammals	Cervidae	<i>Axis axis</i>	chital	Y			1
animals	mammals	Emballonuridae	<i>Taphozous australis</i>	coastal sheath-tail bat			NT	3
animals	mammals	Emballonuridae	<i>Taphozous trough-toni</i>	Troughton's sheath-tail bat			C	7
animals	mammals	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat			C	23
animals	mammals	Felidae	<i>Felis catus</i>	cat	Y			9
animals	mammals	Leporidae	<i>Oryctolagus cuniculus</i>	rabbit	Y			14
animals	mammals	Macropodidae	<i>Petrogale herberti</i>	Herbert's rock-wallaby			C	3
animals	mammals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo			C	12
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby			C	4

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animals	mammals	Macropodidae	<i>Osphranter rufus</i>	red kangaroo		C		1
animals	mammals	Macropodidae	<i>Lagorchestes conspicillatus</i>	spectacled hare-wallaby		C		1
animals	mammals	Macropodidae	<i>Osphranter robustus</i>	common wallaroo		C		7
animals	mammals	Macropodidae	<i>Petrogale inornata</i>	unadorned rock-wallaby		C		7/2
animals	mammals	Macropodidae	<i>Notamacropus dorsalis</i>	black-striped wallaby		C		1
animals	mammals	Miniopteridae	<i>Miniopterus australis</i>	little bent-wing bat		C		9
animals	mammals	Miniopteridae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat		C		5
animals	mammals	Molossidae	<i>Mormopterus sp.</i>			C		1
animals	mammals	Molossidae	<i>Mormopterus lumsdenae</i>	northern free-tailed bat		C		11
animals	mammals	Molossidae	<i>Mormopterus norfolkensis</i>	east coast freetail bat		C		1
animals	mammals	Molossidae	<i>Mormopterus ridei</i>	eastern free-tailed bat		C		7
animals	mammals	Molossidae	<i>Chaerephon jobensis</i>	northern freetail bat		C		14
animals	mammals	Muridae	<i>Hydromys chrysogaster</i>	water rat		C		2
animals	mammals	Muridae	<i>Rattus fuscipes</i>	bush rat		C		1
animals	mammals	Muridae	<i>Rattus rattus</i>	black rat	Y			1
animals	mammals	Muridae	<i>Pseudomys delicatulus</i>	delicate mouse		C		4
animals	mammals	Peramelidae	<i>Isodon macrourus</i>	northern brown bandicoot		C		1
animals	mammals	Petauridae	<i>Petaurus norfolkensis</i>	squirrel glider		C		2
animals	mammals	Petauridae	<i>Petaurus notatus</i>	Kreff's glider		C		7
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		7
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	7
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		4
animals	mammals	Pseudocheiridae	<i>Petauroides armillatus</i>	central greater glider		V	V	30
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		2
animals	mammals	Suidae	<i>Sus scrofa</i>	pig	Y			6
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		10
animals	mammals	Vespertilionidae	<i>Nyctophilus sp.</i>			C		7
animals	mammals	Vespertilionidae	<i>Vespadelus sp.</i>			C		1
animals	mammals	Vespertilionidae	<i>Scotorepens sp.</i>			C		2
animals	mammals	Vespertilionidae	<i>Chalinolobus sp.</i>			C		14
animals	mammals	Vespertilionidae	<i>Chalinolobus morio</i>	chocolate wattled bat		C		10
animals	mammals	Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's long-eared bat		C		5
animals	mammals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		C		21
animals	mammals	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat		C		28
animals	mammals	Vespertilionidae	<i>Chalinolobus picatus</i>	little pied bat		C		9
animals	mammals	Vespertilionidae	<i>Scotorepens balstoni</i>	inland broad-nosed bat		C		8
animals	mammals	Vespertilionidae	<i>Vespadelus troughtoni</i>	eastern cave bat		C		16
animals	mammals	Vespertilionidae	<i>Chalinolobus nigrogriseus</i>	hoary wattled bat		C		14
animals	mammals	Vespertilionidae	<i>Vespadelus baverstocki</i>	inland forest bat		C		11
animals	reptiles	Agamidae	<i>Diporiphora nobbi</i>	nobbi		C		2
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		9
animals	reptiles	Agamidae	<i>Pogona vitticeps</i>	central bearded dragon		C		1
animals	reptiles	Agamidae	<i>Chlamydosaurus kingii</i>	frilled lizard		C		1
animals	reptiles	Agamidae	<i>Diporiphora australis</i>	tommy roundhead		C		6
animals	reptiles	Boidae	<i>Aspidites melanocephalus</i>	black-headed python		C		1
animals	reptiles	Boidae	<i>Antaresia maculosa</i>	spotted python		C		4

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animals	reptiles	Carphodactylidae	<i>Nephrurus asper</i>	spiny knob-tailed gecko		C		12
animals	reptiles	Chelidae	<i>Chelodina longicollis</i>	eastern snake-necked turtle		C		1
animals	reptiles	Colubridae	<i>Dendrelaphis punctulatus</i>	green tree snake		C		5
animals	reptiles	Colubridae	<i>Boiga irregularis</i>	brown tree snake		C		4
animals	reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		2
animals	reptiles	Diplodactylidae	<i>Diplodactylus platyurus</i>	eastern fat-tailed gecko		C		3
animals	reptiles	Diplodactylidae	<i>Lucasium steindachneri</i>	Steindachner's gecko		C		11
animals	reptiles	Diplodactylidae	<i>Diplodactylus vittatus</i>	wood gecko		C		13
animals	reptiles	Diplodactylidae	<i>Strophurus williamsi</i>	soft-spined gecko		C		14
animals	reptiles	Diplodactylidae	<i>Oedura monilis</i>	ocellated velvet gecko		C		24
animals	reptiles	Diplodactylidae	<i>Oedura monilis sensu lato</i>	ocellated velvet gecko		C		20
animals	reptiles	Elapidae	<i>Denisonia maculata</i>	ornamental snake		V	V	3
animals	reptiles	Elapidae	<i>Hoplocephalus bitorquatus</i>	pale-headed snake		C		6
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		6
animals	reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake		C		4
animals	reptiles	Elapidae	<i>Cryptophis boschmai</i>	Carpentaria whip snake		C		2
animals	reptiles	Elapidae	<i>Suta suta</i>	myall snake		C		3
animals	reptiles	Gekkonidae	<i>Gehyra catenata</i>	chain-backed dtella		C		17
animals	reptiles	Gekkonidae	<i>Gehyra sp.</i>			C		1
animals	reptiles	Gekkonidae	<i>Gehyra versicolor</i>			C		20
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella		C		119
animals	reptiles	Gekkonidae	<i>Heteronotia binoei</i>	Bynoe's gecko		C		91
animals	reptiles	Pygopodidae	<i>Delma tincta</i>	excitable delma		C		1
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		16
animals	reptiles	Pygopodidae	<i>Paradelma orientalis</i>	brigalow scaly-foot		C		2
animals	reptiles	Scincidae	<i>Lerista fragilis</i>	eastern mulch slider		C		10
animals	reptiles	Scincidae	<i>Ctenotus ingrami</i>	unspotted yellow-sided ctenotus		C		15
animals	reptiles	Scincidae	<i>Egernia striolata</i>	tree skink		C		2
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus		C		21
animals	reptiles	Scincidae	<i>Ctenotus strauchii</i>	eastern barred wedgesnout ctenotus		C		1
animals	reptiles	Scincidae	<i>Lygisaurus foliorum</i>	tree-base litter-skink		C		62
animals	reptiles	Scincidae	<i>Morethia boulengeri</i>	south-eastern morethia skink		C		52
animals	reptiles	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink		C		14
animals	reptiles	Scincidae	<i>Morethia taeniopleura</i>	fire-tailed skink		C		6
animals	reptiles	Scincidae	<i>Pygmaeascincus timlowi</i>	dwarf litter-skink		C		10
animals	reptiles	Scincidae	<i>Lerista punctatovittata</i>	eastern robust slider		C		2
animals	reptiles	Scincidae	<i>Cryptoblepharus pannosus</i>	ragged snake-eyed skink		C		3
animals	reptiles	Scincidae	<i>Liburnascincus mundivensis</i>	outcrop rainbow-skink		C		1
animals	reptiles	Scincidae	<i>Glaphyromorphus punctulatus</i>	fine-spotted mulch-skink		C		2
animals	reptiles	Scincidae	<i>Carlia pectoralis sensu lato</i>			C		16
animals	reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink		C		28
animals	reptiles	Scincidae	<i>Cryptoblepharus virgatus sensu lato</i>			C		5
animals	reptiles	Scincidae	<i>Carlia schmeltzii</i>	robust rainbow-skink		C		8
animals	reptiles	Scincidae	<i>Lerista sp.</i>			C		1
animals	reptiles	Scincidae	<i>Carlia munda</i>	shaded-litter rainbow-skink		C		1
animals	reptiles	Scincidae	<i>Menetia greyii</i>	common dwarf skink		C		16

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animals	reptiles	Scincidae	<i>Lygisaurus sp.</i>			C		1
animals	reptiles	Scincidae	<i>Carlia rubigo</i>	orange-flanked rainbow skink		C		113
animals	reptiles	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink		C		11
animals	reptiles	Typhlopidae	<i>Anilius affinis</i>	small-headed blind snake		C		2
animals	reptiles	Typhlopidae	<i>Anilius unguirostris</i>	claw-snouted blind snake		C		1
animals	reptiles	Varanidae	<i>Varanus tristis</i>	black-tailed monitor		C		5
animals	uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending				1
fungi	lecanoromycetes	Lecideaceae	<i>Lecidea</i>					3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia ballingalliana</i>			C		2/2
fungi	lecanoromycetes	Physciaceae	<i>Rinodina</i>					1/1
fungi	lecanoromycetes	Teloschistaceae	<i>Caloplaca cinnabarina</i>			C		1/1
fungi	lichinomycetes	Peltulaceae	<i>Peltula placodizans</i>			C		1/1
plants	land plants	Acanthaceae	<i>Rostellularia adscendens</i>			C		2/1
plants	land plants	Amaranthaceae	<i>Ptilotus uncinellus</i>			E		1/1
plants	land plants	Amaranthaceae	<i>Gomphrena celosioides</i>	gomphrena weed	Y			1
plants	land plants	Amaranthaceae	<i>Alternanthera nodiflora</i>	joyweed		C		1
plants	land plants	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1
plants	land plants	Apocynaceae	<i>Carissa lanceolata</i>			C		1
plants	land plants	Apocynaceae	<i>Cerbera dumicola</i>			NT		7/4
plants	land plants	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope		C		1
plants	land plants	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		2
plants	land plants	Apocynaceae	<i>Asclepias curassavica</i>	red-head cottonbush	Y			1
plants	land plants	Apocynaceae	<i>Marsdenia viridiflora subsp. viridiflora</i>			C		1/1
plants	land plants	Apocynaceae	<i>Marsdenia microlepis</i>			C		1
plants	land plants	Araliaceae	<i>Astrotricha biddulphiana</i>			C		1/1
plants	land plants	Asteraceae	<i>Parthenium hysterophorus</i>	parthenium weed	Y			2
plants	land plants	Asteraceae	<i>Symphotrichum subulatum</i>		Y			1
plants	land plants	Asteraceae	<i>Pterocaulon serrulatum var. serrulatum</i>			C		1/1
plants	land plants	Asteraceae	<i>Pluchea dentex</i>	bowl daisy		C		1/1
plants	land plants	Asteraceae	<i>Bidens bipinnata</i>	bipinnate beggar's ticks	Y			1
plants	land plants	Asteraceae	<i>Calotis cuneifolia</i>	burr daisy		C		2/1
plants	land plants	Asteraceae	<i>Emilia sonchifolia</i>		Y			1
plants	land plants	Asteraceae	<i>Euchiton sphaericus</i>			C		1/1
plants	land plants	Asteraceae	<i>Pterocaulon redolens</i>			C		1
plants	land plants	Asteraceae	<i>Xanthium occidentale</i>		Y			1
plants	land plants	Asteraceae	<i>Ageratum houstonianum</i>	blue billygoat weed	Y			1
plants	land plants	Asteraceae	<i>Cyanthillium cinereum</i>			C		2
plants	land plants	Bignoniaceae	<i>Pandorea pandorana</i>	wonga vine		C		1
plants	land plants	Bignoniaceae	<i>Pandorea</i>					1/1
plants	land plants	Boraginaceae	<i>Heliotropium indicum</i>		Y			1/1
plants	land plants	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		1
plants	land plants	Boraginaceae	<i>Heliotropium geocharis</i>			C		2/2
plants	land plants	Byttneriaceae	<i>Hannafordia shanesii</i>			C		1/1
plants	land plants	Cactaceae	<i>Harrisia martinii</i>		Y			1
plants	land plants	Cactaceae	<i>Opuntia</i>					1
plants	land plants	Cactaceae	<i>Opuntia stricta</i>		Y			2

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plants	land plants	Caesalpiniaceae	<i>Lysiphyllum</i>					1
plants	land plants	Caesalpiniaceae	<i>Cassia tomentella</i>			C		1/1
plants	land plants	Caesalpiniaceae	<i>Lysiphyllum hookeri</i>	Queensland ebony		C		2
plants	land plants	Caesalpiniaceae	<i>Lysiphyllum carronii</i>	ebony tree		C		2
plants	land plants	Caesalpiniaceae	<i>Cassia brewsteri</i>			C		2
plants	land plants	Campanulaceae	<i>Wahlenbergia</i>					1
plants	land plants	Campanulaceae	<i>Lobelia purpurascens</i>	white root		C		1
plants	land plants	Campanulaceae	<i>Lobelia leucotos</i>			C		2/1
plants	land plants	Capparaceae	<i>Capparis anomala</i>			C		1
plants	land plants	Capparaceae	<i>Capparis lasiantha</i>	nipan		C		2/1
plants	land plants	Capparaceae	<i>Capparis canescens</i>			C		1
plants	land plants	Casuarinaceae	<i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i>			C		1
plants	land plants	Celastraceae	<i>Elaeodendron australe</i>			C		1
plants	land plants	Celastraceae	<i>Denhamia cunninghamii</i>			C		1
plants	land plants	Celastraceae	<i>Elaeodendron australe</i> var. <i>integrifolium</i>			C		1/1
plants	land plants	Centrolepidaceae	<i>Centrolepis exserta</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Enchylaena tomentosa</i> var. <i>tomentosa</i>			C		1/1
plants	land plants	Chenopodiaceae	<i>Salsola australis</i>			C		1
plants	land plants	Clusiaceae	<i>Hypericum gramineum</i>			C		1/1
plants	land plants	Combretaceae	<i>Terminalia oblongata</i> subsp. <i>oblongata</i>			C		2
plants	land plants	Commelinaceae	<i>Commelina</i>					1
plants	land plants	Convolvulaceae	<i>Ipomoea plebeia</i>	bellvine		C		1
plants	land plants	Convolvulaceae	<i>Polymeria ambigua</i>			C		1/1
plants	land plants	Convolvulaceae	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>			C		1
plants	land plants	Convolvulaceae	<i>Polymeria longifolia</i>	polymeria		C		1/1
plants	land plants	Cyperaceae	<i>Cyperus bifax</i>	western nutgrass		C		1/1
plants	land plants	Cyperaceae	<i>Gahnia aspera</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus fulvus</i>			C		1
plants	land plants	Cyperaceae	<i>Cyperus gilesii</i>			C		1
plants	land plants	Cyperaceae	<i>Cyperus gracilis</i>			C		2/1
plants	land plants	Cyperaceae	<i>Cyperus rotundus</i>	nutgrass	Y			1
plants	land plants	Cyperaceae	<i>Cyperus exaltatus</i>	tall flatsedge		C		1
plants	land plants	Cyperaceae	<i>Cyperus rigidellus</i>			C		1
plants	land plants	Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony		C		1
plants	land plants	Erpodiaceae	<i>Venturiella hodgkinsoniae</i>			C		1/1
plants	land plants	Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine tree		C		2
plants	land plants	Euphorbiaceae	<i>Croton pheballoides</i>	narrow-leaved croton		C		4/2
plants	land plants	Euphorbiaceae	<i>Euphorbia coghlanii</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Euphorbia sarcostemmoides</i>	climbing caustic		C		1/1
plants	land plants	Euphorbiaceae	<i>Bertya pedicellata</i>			NT		6/6
plants	land plants	Euphorbiaceae	<i>Adriana tomentosa</i> var. <i>tomentosa</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Croton insularis</i>	Queensland cascarilla		C		3/1
plants	land plants	Euphorbiaceae	<i>Acalypha eremorum</i>	soft acalypha		C		2
plants	land plants	Fabaceae	<i>Desmodium campylocaulon</i>			C		1
plants	land plants	Fabaceae	<i>Sesbania cannabina</i> var. <i>cannabina</i>			C		1
plants	land plants	Fabaceae	<i>Indigofera australis</i> subsp. <i>australis</i>			C		1/1

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plants	land plants	Fabaceae	<i>Macroptilium lathyroides</i> var. <i>semierectum</i>		Y			1
plants	land plants	Fabaceae	<i>Crotalaria novae-hollandiae</i> subsp. <i>novae-hollandiae</i>			C		1
plants	land plants	Fabaceae	<i>Stylosanthes</i>					1
plants	land plants	Fabaceae	<i>Hovea longipes</i>	brush hovea		C		1
plants	land plants	Fabaceae	<i>Glycine falcata</i>			C		1/1
plants	land plants	Fabaceae	<i>Clitoria ternatea</i>	butterfly pea	Y			1
plants	land plants	Fabaceae	<i>Crotalaria juncea</i>	sunhemp	Y			1/1
plants	land plants	Fabaceae	<i>Rhynchosia minima</i>			C		2
plants	land plants	Fabaceae	<i>Glycine tomentella</i>	woolly glycine		C		2/1
plants	land plants	Fabaceae	<i>Sesbania cannabina</i>			C		1
plants	land plants	Fabaceae	<i>Desmodium macrocarpum</i>			C		4/3
plants	land plants	Fabaceae	<i>Crotalaria medicaginea</i>	trefoil rattlepod		C		1
plants	land plants	Fabroniaceae	<i>Fabronia australis</i>			C		1/1
plants	land plants	Frullaniaceae	<i>Frullania</i>					1/1
plants	land plants	Juncaceae	<i>Juncus usitatus</i>			C		2
plants	land plants	Lamiaceae	<i>Teucrium junceum</i>			C		1
plants	land plants	Lamiaceae	<i>Ocimum caryophyllinum</i>			C		1/1
plants	land plants	Lamiaceae	<i>Basilicum polystachyon</i>			C		1
plants	land plants	Lamiaceae	<i>Teucrium integrifolium</i>			C		1/1
plants	land plants	Lamiaceae	<i>Clerodendrum floribundum</i>			C		2
plants	land plants	Laxmanniaceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>			C		1
plants	land plants	Laxmanniaceae	<i>Lomandra confertifolia</i> subsp. <i>pallida</i>			C		1
plants	land plants	Laxmanniaceae	<i>Lomandra longifolia</i>			C		2/1
plants	land plants	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry		C		1
plants	land plants	Lecythidaceae	<i>Planchonia careya</i>	cockatoo apple		C		1
plants	land plants	Loranthaceae	<i>Lysiana subfalcata</i>			C		1/1
plants	land plants	Lythraceae	<i>Ammannia multiflora</i>	jerry-jerry		C		1
plants	land plants	Malvaceae	<i>Sida spinosa</i>	spiny sida	Y			2
plants	land plants	Malvaceae	<i>Sida macropoda</i>			C		1/1
plants	land plants	Malvaceae	<i>Sida cordifolia</i>		Y			2
plants	land plants	Malvaceae	<i>Sida trichopoda</i>			C		2/1
plants	land plants	Malvaceae	<i>Hibiscus sturtii</i>			C		1
plants	land plants	Malvaceae	<i>Sida atherophora</i>			C		2/1
plants	land plants	Malvaceae	<i>Sida hackettiana</i>			C		1
plants	land plants	Malvaceae	<i>Sida rhombifolia</i>		Y			2
plants	land plants	Malvaceae	<i>Gossypium sturtianum</i>			C		1
plants	land plants	Malvaceae	<i>Hibiscus divaricatus</i>			C		1/1
plants	land plants	Malvaceae	<i>Abutilon micropetalum</i>			C		1/1
plants	land plants	Malvaceae	<i>Sida filiformis</i> - <i>S. macropoda</i>			C		1
plants	land plants	Meliaceae	<i>Owenia acidula</i>	emu apple		C		1
plants	land plants	Mimosaceae	<i>Acacia julifera</i> subsp. <i>curvinervia</i>			C		1/1
plants	land plants	Mimosaceae	<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>			C		2
plants	land plants	Mimosaceae	<i>Neptunia gracilis</i> forma <i>gracilis</i>			C		1
plants	land plants	Mimosaceae	<i>Acacia crassa</i> subsp. <i>crassa</i>			C		1
plants	land plants	Mimosaceae	<i>Acacia blakei</i> subsp. <i>blakei</i>			C		1/1
plants	land plants	Mimosaceae	<i>Archidendropsis thozetiana</i>			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Mimosaceae	<i>Archidendropsis basaltica</i>	red lancewood		C		1
plants	land plants	Mimosaceae	<i>Acacia bancroftiorum</i>			C		1/1
plants	land plants	Mimosaceae	<i>Acacia harpophylla</i>	brigalow		C		3
plants	land plants	Mimosaceae	<i>Acacia catenulata</i>	bendee		C		1
plants	land plants	Mimosaceae	<i>Acacia shirleyi</i>	lancewood		C		1
plants	land plants	Mimosaceae	<i>Acacia salicina</i>	doolan		C		2/1
plants	land plants	Mimosaceae	<i>Acacia oswaldii</i>	miljee		C		2/1
plants	land plants	Mimosaceae	<i>Acacia conferta</i>			C		2/2
plants	land plants	Mimosaceae	<i>Acacia excelsa</i>			C		2
plants	land plants	Mimosaceae	<i>Acacia</i>					1
plants	land plants	Molluginaceae	<i>Glinus lotoides</i>	hairy carpet weed		C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus</i>					2
plants	land plants	Myrtaceae	<i>Eucalyptus camaldulensis subsp. acuta</i>			C		2
plants	land plants	Myrtaceae	<i>Eucalyptus tereticornis subsp. tereticornis</i>			C		2
plants	land plants	Myrtaceae	<i>Thryptomene parviflora</i>			C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus tholiformis</i>			C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus thozetiana</i>			C		1
plants	land plants	Myrtaceae	<i>Eucalyptus persistens</i>			C		2/1
plants	land plants	Myrtaceae	<i>Eucalyptus cambageana</i>	Dawson gum		C		1
plants	land plants	Myrtaceae	<i>Corymbia clarksoniana</i>			C		2
plants	land plants	Myrtaceae	<i>Melaleuca pallescens</i>			C		1/1
plants	land plants	Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash		C		2
plants	land plants	Myrtaceae	<i>Corymbia dallachiana</i>			C		1
plants	land plants	Myrtaceae	<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany		C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus populnea</i>	poplar box		C		2
plants	land plants	Myrtaceae	<i>Eucalyptus exserta</i>	Queensland peppermint		C		3/1
plants	land plants	Myrtaceae	<i>Eucalyptus brownii</i>	Reid River box		C		2
plants	land plants	Myrtaceae	<i>Calytrix tetragona</i>	fringe myrtle		C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark		C		1
plants	land plants	Myrtaceae	<i>Micromyrtus capricornia</i>			C		1/1
plants	land plants	Myrtaceae	<i>Eucalyptus drepanophylla</i>			C		1
plants	land plants	Nyctaginaceae	<i>Boerhavia sp. (St George A.Hill AQ399299)</i>			C		1/1
plants	land plants	Onagraceae	<i>Ludwigia octovalvis</i>	willow primrose		C		1
plants	land plants	Orchidaceae	<i>Cymbidium canaliculatum</i>			C		2
plants	land plants	Phyllanthaceae	<i>Breynia oblongifolia</i>			C		1
plants	land plants	Phyllanthaceae	<i>Flueggea leucopyrus</i>			C		1
plants	land plants	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree		C		2
plants	land plants	Pittosporaceae	<i>Pittosporum angustifolium</i>			C		1
plants	land plants	Pittosporaceae	<i>Bursaria incana</i>			C		2/1
plants	land plants	Pittosporaceae	<i>Pittosporum spinescens</i>			C		1
plants	land plants	Plantaginaceae	<i>Scoparia dulcis</i>	scoparia	Y			2
plants	land plants	Poaceae	<i>Cleistochloa subjuncea</i>			C		1
plants	land plants	Poaceae	<i>Enneapogon lindleyanus</i>			C		1
plants	land plants	Poaceae	<i>Urochloa mosambicensis</i>	sabi grass	Y			1
plants	land plants	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		1
plants	land plants	Poaceae	<i>Paspalidium caespitosum</i>	brigalow grass		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Poaceae	<i>Sporobolus jacquemontii</i>		Y			1/1
plants	land plants	Poaceae	<i>Paspalidium albobillosum</i>			C		1
plants	land plants	Poaceae	<i>Sporobolus australasicus</i>			C		1
plants	land plants	Poaceae	<i>Dichanthium queenslandicum</i>			V	E	4/4
plants	land plants	Poaceae	<i>Cynodon dactylon</i> var. <i>dactylon</i>		Y			2
plants	land plants	Poaceae	<i>Aristida calycina</i> var. <i>calycina</i>			C		1/1
plants	land plants	Poaceae	<i>Megathyrsus maximus</i> var. <i>maximus</i>		Y			1
plants	land plants	Poaceae	<i>Aristida holathera</i> var. <i>holathera</i>			C		1/1
plants	land plants	Poaceae	<i>Setaria pumila</i> subsp. <i>subtesselata</i>		Y			1/1
plants	land plants	Poaceae	<i>Megathyrsus maximus</i> var. <i>pubiglumis</i>		Y			2
plants	land plants	Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>			C		1/1
plants	land plants	Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>			C		1
plants	land plants	Poaceae	<i>Aristida jerichoensis</i> var. <i>subspinulifera</i>			C		1/1
plants	land plants	Poaceae	<i>Bothriochloa decipiens</i> var. <i>cloncurrrensensis</i>			C		1
plants	land plants	Poaceae	<i>Calyptochloa gracillima</i> subsp. <i>gracillima</i>			C		3/1
plants	land plants	Poaceae	<i>Poaceae</i>					1
plants	land plants	Poaceae	<i>Setaria</i>					1
plants	land plants	Poaceae	<i>Bothriochloa</i>					1
plants	land plants	Poaceae	<i>Eulalia aurea</i>	silky browntop		C		1
plants	land plants	Poaceae	<i>Chloris gayana</i>	rhodes grass	Y			1
plants	land plants	Poaceae	<i>Melinis repens</i>	red natal grass	Y			2
plants	land plants	Poaceae	<i>Chloris virgata</i>	feathertop rhodes grass	Y			2
plants	land plants	Poaceae	<i>Eleusine indica</i>	crowsfoot grass	Y			1/1
plants	land plants	Poaceae	<i>Panicum effusum</i>			C		1
plants	land plants	Poaceae	<i>Aristida lignosa</i>			C		1
plants	land plants	Poaceae	<i>Digitaria blakei</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria fumida</i>			C		1/1
plants	land plants	Poaceae	<i>Digitaria minima</i>			C		1
plants	land plants	Poaceae	<i>Themeda avenacea</i>			C		2/1
plants	land plants	Poaceae	<i>Themeda triandra</i>	kangaroo grass		C		2
plants	land plants	Poaceae	<i>Aristida calycina</i>			C		2
plants	land plants	Poaceae	<i>Astrebla lappacea</i>	curly mitchell grass		C		2/2
plants	land plants	Poaceae	<i>Cenchrus ciliaris</i>		Y			3
plants	land plants	Poaceae	<i>Dinebra decipiens</i>			C		1
plants	land plants	Poaceae	<i>Eriochloa procera</i>	slender cupgrass		C		1
plants	land plants	Poaceae	<i>Sorghum halepense</i>	Johnson grass	Y			1
plants	land plants	Poaceae	<i>Sporobolus caroli</i>	fairly grass		C		1
plants	land plants	Poaceae	<i>Thellungia advena</i>	coolibah grass		C		1/1
plants	land plants	Poaceae	<i>Urochloa piligera</i>			C		1
plants	land plants	Poaceae	<i>Aristida personata</i>			C		1
plants	land plants	Poaceae	<i>Astrebla squarrosa</i>	bull mitchell grass		C		1/1
plants	land plants	Poaceae	<i>Digitaria ciliaris</i>	summer grass	Y			1
plants	land plants	Poaceae	<i>Echinochloa colona</i>	awnless barnyard grass	Y			2/1
plants	land plants	Poaceae	<i>Paspalum dilatatum</i>	paspalum	Y			1
plants	land plants	Poaceae	<i>Digitaria ammophila</i>	silky umbrella grass		C		1
plants	land plants	Poaceae	<i>Enteropogon ramosus</i>			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Poaceae	<i>Eragrostis elongata</i>			C		2
plants	land plants	Poaceae	<i>Leptochloa digitata</i>			C		1
plants	land plants	Poaceae	<i>Sporobolus fertilis</i>	giant Parramatta grass	Y			1/1
plants	land plants	Poaceae	<i>Bothriochloa bladhii</i>			C		1
plants	land plants	Poaceae	<i>Bothriochloa pertusa</i>		Y			2/1
plants	land plants	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass		C		2
plants	land plants	Poaceae	<i>Dichanthium fecundum</i>	curly bluegrass		C		1/1
plants	land plants	Poaceae	<i>Dichanthium sericeum</i>			C		1
plants	land plants	Poaceae	<i>Eragrostis lacunaria</i>	purple lovegrass		C		1
plants	land plants	Poaceae	<i>Eragrostis tenellula</i>	delicate lovegrass		C		1
plants	land plants	Poaceae	<i>Sporobolus elongatus</i>			C		2/1
plants	land plants	Poaceae	<i>Sporobolus scabridus</i>			C		1
plants	land plants	Poaceae	<i>Themeda quadrivalvis</i>	grader grass	Y			1
plants	land plants	Poaceae	<i>Dichanthium annulatum</i>	sheda grass	Y			1
plants	land plants	Poaceae	<i>Dichanthium aristatum</i>	angleton grass	Y			1
plants	land plants	Poaceae	<i>Dichanthium caricosum</i>		Y			1/1
plants	land plants	Poaceae	<i>Eragrostis tenuifolia</i>	elastic grass	Y			1/1
plants	land plants	Poaceae	<i>Heteropogon contortus</i>	black speargrass		C		2
plants	land plants	Poaceae	<i>Heteropogon triticeus</i>	giant speargrass		C		1
plants	land plants	Poaceae	<i>Aristida caput-medusae</i>			C		1
plants	land plants	Poaceae	<i>Bothriochloa ewartiana</i>	desert bluegrass		C		3/2
plants	land plants	Proteaceae	<i>Persoonia amaliae</i>			C		1/1
plants	land plants	Proteaceae	<i>Hakea lorea subsp. lorea</i>			C		1
plants	land plants	Pteridaceae	<i>Cheilanthes distans</i>	bristly cloak fern		C		1/1
plants	land plants	Pteridaceae	<i>Cheilanthes sieberi subsp. sieberi</i>			C		1
plants	land plants	Ptychomitriaceae	<i>Ptychomitrium australe</i>			C		1/1
plants	land plants	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		2
plants	land plants	Rhamnaceae	<i>Ventilago viminalis</i>	supplejack		C		1/1
plants	land plants	Rubiaceae	<i>Psydrax odorata</i>			C		1
plants	land plants	Rubiaceae	<i>Everistia vacciniifolia forma vacciniifolia</i>			C		2
plants	land plants	Rubiaceae	<i>Spermacoce sp. (Dislyn A.R.Bean 14098)</i>			C		1/1
plants	land plants	Rubiaceae	<i>Psydrax odorata subsp. australiana</i>			C		1/1
plants	land plants	Rubiaceae	<i>Dolichocarpa coerulescens</i>			C		1/1
plants	land plants	Rubiaceae	<i>Spermacoce brachystema</i>			C		1/1
plants	land plants	Rubiaceae	<i>Larsenaikia ochreatea</i>			C		2/1
plants	land plants	Rubiaceae	<i>Dentella repens</i>	dentella		C		1/1
plants	land plants	Rutaceae	<i>Phebalium nottii</i>	pink phebalium		C		2
plants	land plants	Rutaceae	<i>Citrus glauca</i>			C		1
plants	land plants	Rutaceae	<i>Phebalium glandulosum subsp. glandulosum</i>			C		1/1
plants	land plants	Rutaceae	<i>Flindersia dissosperma</i>			C		1
plants	land plants	Rutaceae	<i>Flindersia australis</i>	crow's ash		C		1
plants	land plants	Rutaceae	<i>Flindersia maculosa</i>	leopardwood		C		1
plants	land plants	Rutaceae	<i>Geijera parviflora</i>	wilga		C		1
plants	land plants	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		2
plants	land plants	Sapindaceae	<i>Atalaya hemiglauca</i>			C		1
plants	land plants	Sapindaceae	<i>Atalaya</i>					1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Sapotaceae	<i>Planchonella pohlmaniana</i>			C		2/2
plants	land plants	Scrophulariaceae	<i>Eremophila deserti</i>			C		1
plants	land plants	Scrophulariaceae	<i>Myoporum acuminatum</i>	coastal boobialla		C		1/1
plants	land plants	Scrophulariaceae	<i>Eremophila mitchellii</i>			C		2
plants	land plants	Simaroubaceae	<i>Samadera sp. (Dam Creek T.S.Ryan 1006)</i>			C		1/1
plants	land plants	Solanaceae	<i>Solanum ellipticum</i>	potato bush		C		2/1
plants	land plants	Solanaceae	<i>Solanum esuriale</i>	quena		C		1/1
plants	land plants	Solanaceae	<i>Solanum</i>					1
plants	land plants	Sterculiaceae	<i>Brachychiton populneus subsp. trilobus</i>			C		1/1
plants	land plants	Stereophyllaceae	<i>Stereophyllum radiculosum</i>			C		1/1
plants	land plants	Verbenaceae	<i>Stachytarpheta jamaicensis</i>	Jamaica snakeweed	Y			1
plants	land plants	Violaceae	<i>Afrohybanthus stellarioides</i>			C		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 B Ellensfield Study Area Site-based Attribute Scores



Assessment Unit	2			2			2			2			2		
Site	S31			S35			S37			S38			S41		
Regional ecosystem	11.10.4a			11.10.4a			11.10.4a			11.10.4a			11.10.4a		
Broad condition state	Remnant			Remnant			Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		66	3		75	5		75	5		75	5
Native plant species richness - trees (No.)	4	3	2.5	4	4	5	4	4	5	4	4	5	4	4	5
Native plant species richness - shrubs (No.)	6	6	5	6	5	2.5	6	4	2.5	6	9	5	6	8	5
Native plant species richness - grasses (No.)	5	4	2.5	5	2	2.5	5	4	2.5	5	9	5	5	2	2.5
Native plant species richness - forbs (No.)	5	6	5	5	3	2.5	5	8	5	5	5	5	5	3	2.5
Tree emergent height (m)	na	0		na	0		na	0		na	0		na	0	
Tree canopy height (m)	20	15	5	20	12	3	20	15	5	20	16	5	20	12	3
Tree sub-canopy height (m)	na	6		na	7		na	8		na	9		na	6	
Tree height - average			5			3			5			5			3
Tree emergent cover (%)	na	0		na	0		na	0		na	0		na	0	
Tree canopy cover (%)	27	35.8	5	27	0	0	27	45	5	27	39	5	27	42	5
Tree sub-canopy cover (%)	na	40		na	0		na	25		na	10		na	15	
Tree cover - average			5			0			5			5			5
Native shrub canopy cover (%)	4	3	5	4	5	5	4	2	5	4	8	5	4	5	5
Native perennial grass cover (%)	23	16	3	23	0.6	0	23	37.6	5	23	19	3	23	14.4	3
Organic litter (%)	30	38	5	30	0	0	30	48	5	30	31	5	30	73.6	3
Large trees/ha - total	21	2	5	21	0	0	21	0	0	21	0	0	21	0	0
Coarse woody debris (m/ha)	410	90	2	410	40	0	410	580	5	410	720	5	410	650	5
Non-native plant cover (%)	0	0	10	0	1	10	0	1	10	0	1	10	0	0	10
Maximum site-based score			80			80			80			80			80
Site-based BioCondition score (out of 10)			7.5			4.19			7.5			7.88			6.75

Assessment Unit (AU)

2

Average AU BioCondition Score

6.7625



Assessment Unit	3			3			3			3			3		
Site	S10			S11			S32			S34			S36		
Regional ecosystem	11.10.7			11.10.7			11.10.7			11.10.7			11.10.7		
Broad condition state	Remnant			Remnant			Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		100	5		60	3		33	3
Native plant species richness - trees (No.)	6	4	2.5	6	4	2.5	6	4	2.5	6	5	2.5	6	3	2.5
Native plant species richness - shrubs (No.)	6	3	2.5	6	9	5	6	7	5	6	7	5	6	8	5
Native plant species richness - grasses (No.)	7	9	5	7	8	5	7	2	2.5	7	3	2.5	7	3	2.5
Native plant species richness - forbs (No.)	9	6	2.5	9	7	2.5	9	3	2.5	9	5	2.5	9	5	2.5
Tree emergent height (m)	na	0		na	0		na	0		na	0		na	0	
Tree canopy height (m)	18	14.5	5	18	13.5	5	18	16	5	18	16	5	18	14	5
Tree sub-canopy height (m)	7	6	5	7	7	5	7	5	5	7	8	5	7	5	5
Tree height - average			5			5			5			5			5
Tree emergent cover (%)	na	0		na	0		na	0		na	0		na	0	
Tree canopy cover (%)	40	22.2	5	40	12.8	2	40	25	5	40	27	5	40	20	5
Tree sub-canopy cover (%)	17	8.2	2	17	48.6	3	17	17.5	5	17	10	5	17	5	2
Tree cover - average			3.5			2.5			5			5			3.5
Native shrub canopy cover (%)	8	0	0	8	1.7	3	8	10	5	8	11	5	8	3	3
Native perennial grass cover (%)	20	28	5	20	40	5	20	5.4	1	20	6	1	20	5.4	1
Organic litter (%)	53	40	5	53	28	5	53	44	5	53	59	5	53	5	0
Large trees/ha - total	23	6	5	23	4	5	23	0	0	23	0	0	23	0	0
Coarse woody debris (m/ha)	387	40	2	387	300	5	387	260	5	387	730	5	387	210	5
Non-native plant cover (%)	0	12	5	0	10	5	0	5	5	0	2	10	0	1	10
Maximum site-based score			80			80			80			80			80
Site-based BioCondition score (out of 10)			6			6.9375			6.0625			6.4375			5.375

Assessment Unit (AU) 3
Average AU BioCondition Score 6.0625



Assessment Unit	3			3			3		
Site	S39			S6			S7		
Regional ecosystem	11.10.7			11.10.7			11.10.7		
Broad condition state	Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		100	5
Native plant species richness - trees (No.)	6	1	0	6	8	5	6	4	2.5
Native plant species richness - shrubs (No.)	6	4	2.5	6	7	5	6	4	2.5
Native plant species richness - grasses (No.)	7	4	2.5	7	6	2.5	7	9	5
Native plant species richness - forbs (No.)	9	3	2.5	9	8	2.5	9	7	2.5
Tree emergent height (m)	na	0		na	0		na	0	
Tree canopy height (m)	18	16	5	18	14	5	18	12	3
Tree sub-canopy height (m)	7	0	0	7	6	5	7	7	5
Tree height - average			2.5			5			4
Tree emergent cover (%)	na	0		na	0		na	0	
Tree canopy cover (%)	40	30	5	40	55.4	5	40	22.8	5
Tree sub-canopy cover (%)	17	0	0	17	25.2	5	17	1.7	2
Tree cover - average			2.5			5			3.5
Native shrub canopy cover (%)	8	0	0	8	4	5	8	0.4	0
Native perennial grass cover (%)	20	21	5	20	13.4	3	20	35	5
Organic litter (%)	53	26	3	53	47.6	5	53	23	3
Large trees/ha - total	23	0	0	23	4	5	23	0	0
Coarse woody debris (m/ha)	387	240	5	387	220	5	387	520	5
Non-native plant cover (%)	0	1	10	0	10	5	0	5	5
Maximum site-based score	80			80			80		
Site-based BioCondition score (out of 10)	5.0625			7.25			5.375		
Assessment Unit (AU) 3									
Average AU BioCondition Score 6.0625									



Assessment Unit	6			6			6			3		
Site	S12			S20			S30			S32		
Regional ecosystem	11.3.25			11.3.25			11.3.25			11.3.25		
Broad condition state	Remnant			Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		100	5		60	3
Native plant species richness - trees (No.)	6	4	2.5	6	4	2.5	6	4	2.5	6	5	2.5
Native plant species richness - shrubs (No.)	6	3	2.5	6	9	5	6	7	5	6	7	5
Native plant species richness - grasses (No.)	7	9	5	7	8	5	7	2	2.5	7	3	2.5
Native plant species richness - forbs (No.)	9	6	2.5	9	7	2.5	9	3	2.5	9	5	2.5
Tree emergent height (m)	na	0		na	0		na	0		na	0	
Tree canopy height (m)	18	14.5	5	18	13.5	5	18	16	5	18	16	5
Tree sub-canopy height (m)	7	6	5	7	7	5	7	5	5	7	8	5
Tree height - average			5			5			5			5
Tree emergent cover (%)	na	0		na	0		na	0		na	0	
Tree canopy cover (%)	40	22.2	5	40	12.8	2	40	25	5	40	27	5
Tree sub-canopy cover (%)	17	8.2	2	17	48.6	3	17	17.5	5	17	10	5
Tree cover - average			3.5			2.5			5			5
Native shrub canopy cover (%)	8	0	0	8	1.7	3	8	10	5	8	11	5
Native perennial grass cover (%)	20	28	5	20	40	5	20	5.4	1	20	6	1
Organic litter (%)	53	40	5	53	28	5	53	44	5	53	59	5
Large trees/ha - total	23	6	5	23	4	5	23	0	0	23	0	0
Coarse woody debris (m/ha)	387	40	2	387	300	5	387	260	5	387	730	5
Non-native plant cover (%)	0	12	5	0	10	5	0	5	5	0	2	10
Maximum site-based score			80			80			80			80
Site-based BioCondition score (out of 10)			6			6.9375			6.0625			6.4375
Assessment Unit (AU) 6												
Average AU BioCondition Score 5.85416												



Assessment Unit	7			7			7			7			7		
Site	S4			S5			S52			S8			S9		
Regional ecosystem	11.3.4			11.3.4			11.3.4			11.3.4			11.3.4		
Broad condition state	Remnant			Remnant			Remnant			Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5		40	3		67	3		100	5
Native plant species richness - trees (No.)	4	9	5	4	3	2.5	4	5	5	4	5	5	4	8	5
Native plant species richness - shrubs (No.)	2	6	5	2	1	2.5	2	6	5	2	5	5	2	3	5
Native plant species richness - grasses (No.)	7	10	5	7	4	2.5	7	1	0	7	8	5	7	7	5
Native plant species richness - forbs (No.)	10	11	5	10	8	2.5	10	1	0	10	5	2.5	10	7	2.5
Tree emergent height (m)	na	0		na	0		na	0		na	0		na	0	
Tree canopy height (m)	22	18	5	22	21	5	22	24	5	22	16.5	5	22	17.5	5
Tree sub-canopy height (m)	12	9	5	12	10	5	12	10	5	12	8	3	12	8	3
Tree height - average			5			5			5			4			4
Tree emergent cover (%)	na	0		na	0		na	0		na	0		na	0	
Tree canopy cover (%)	17	44.3	3	17	30.2	5	17	8	2	17	27.6	5	17	55.2	3
Tree sub-canopy cover (%)	5	7.4	5	5	5.4	5	5	15	3	5	8.1	5	5	21.4	3
Tree cover - average			4			5			2.5			5			3
Native shrub canopy cover (%)	1	1.3	5	1	1.2	5	1	5	3	1	0.8	5	1	2	5
Native perennial grass cover (%)	43	46	5	43	16	1	43	1	0	43	21	1	43	16.8	1
Organic litter (%)	20	27	5	20	19	5	20	41	3	20	24	5	20	27.6	5
Large trees/ha - total	35	16	5	35	8	5	35	8	5	35	4	5	35	18	10
Coarse woody debris (m/ha)	384	395	5	384	55	2	384	240	5	384	280	5	384	150	2
Non-native plant cover (%)	0	10	5	0	30	3	0	100	0	0	20	5	0	15	5
Maximum site-based score			80			80			80			80			80
Site-based BioCondition score (out of 10)			8			5.75			4.5625			6.9375			7.1875

Assessment Unit (AU) 7
Average AU BioCondition Score 6.4875



Assessment Unit	8			8		
Site	S16			S3		
Regional ecosystem	11.9.9			11.9.9		
Broad condition state	Remnant			Remnant		
Biocondition attribute	Benchmark	Value	Score	Benchmark	Value	Score
Recruitment of woody perennial species (%)		100	5		100	5
Native plant species richness - trees (No.)	3	9	5	3	7	5
Native plant species richness - shrubs (No.)	7	4	2.5	7	10	5
Native plant species richness - grasses (No.)	7	7	5	7	10	5
Native plant species richness - forbs (No.)	8	4	2.5	8	4	2.5
Tree emergent height (m)	na	0		na	0	
Tree canopy height (m)	18	15.5	5	18	14.5	5
Tree sub-canopy height (m)	6	7	5	6	7	5
Tree height - average			5			5
Tree emergent cover (%)	na	0		na	0	
Tree canopy cover (%)	20	9.3	2	20	26.6	5
Tree sub-canopy cover (%)	4	12.4	3	4	21.4	3
Tree cover - average			2.5			4
Native shrub canopy cover (%)	5	1.9	3	5	0	0
Native perennial grass cover (%)	22	21	5	22	26	5
Organic litter (%)	39	21	5	39	17	3
Large trees/ha - total	12	8	10	12	18	15
Coarse woody debris (m/ha)	268	100	2	268	140	5
Non-native plant cover (%)	0	7	5	0	40	3
Maximum site-based score	80			80		
Site-based BioCondition score (out of 10)	7.1875			7.8125		
Assessment Unit (AU) 8						
Average AU BioCondition Score 7.5						





Appendix C Ellensfield Study Area Fauna Species-based Attribute Scores



Species	Habitat attributes	Indicators	Score	Weighting	Weighted score	
Koala	Quality and availability of food and habitat required for	Abundance of koala food trees (absent (0) to high (5)) x5	15	1	15	
		Sub-total		1	15.00	
		Quality and availability of	Abundance of koala shelter trees (absent (0) to high (5)) x5	15	1	15
		habitat required for shelter and	Sub-total		1	15
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation (completely fragmented (0) to highly connected (5)) x5	20	1	20	
		Sub-total		1	20	
	Threat Abundance	Historical clearing / fragmentation (abundant (0) to absent (5)) x5	20	0.4	8	
		Abundance of feral dogs (abundant (0) to absent (5)) x5	10	0.4	4	
		Vehicle strike risk (high (0) to absent (5)) x5	25	0.2	5	
		Sub-total		1	17	
Total				6.70		
Greater Glider	Quality and availability of food and habitat required for foraging	Abundance of food trees / eucalypts (absent (0) to high (5)) x5	15	0.5	7.5	
		canopy cover (low (0) to high (5)) x5	10	0.5	5	
		Sub-total			12.50	
	Quality and availability of habitat required for shelter and breeding	Abundance of large hollows (absent (0) to high (5)) x 5	10	0.5	5	
		Canopy cover (low (0) to high (5)) x 5	10	0.5	5	
					10	
	Quality and availability of habitat required for mobility	Connectivity to remnant vegetation (completely fragmented (0) to highly connected (5)) x5	20	0.5	10	
		Average patch size (<1ha (0), 1-5ha (8.3), 5-10ha (16.6), >10ha (25))	25	0.5	12.5	
		Sub-total			20	
	Threat Abundance	Historical clearing / fragmentation (abundant (0) to high (5)) x5	20	0.6	12	
		Bushfire risk (high (0) to low (5)) x5	15	0.3	4.5	
		Barbwire entanglement risk (abundant (0) to absent (5)) x5	20	0.1	2	
		Sub-total		1	18.5	
Total				6.10		
Squatter pigeon	Quality and availability of food and habitat required for foraging	Average ground cover density (sparse <5% (2), patchy 6-33% (5), dense 34-69% (2), very dense >70% (0)) x 5	20	0.5	10	
		Average distance to permanent water (>3km (0), 1-3km (12.5), <1km (25))	0	0.5	0	
		Sub-total			10.00	
	Quality and availability of habitat required for shelter and breeding	Average distance to water (>3km (0), 1-3km (12.5), <1km (25))	0	0.5	0	
		Average ground cover density (sparse <5% (2), patchy 6-33% (5), dense 34-69% (2), very dense >70% (0)) x 5	25	0.25	6.25	
		well draining soil	10	0.25	2.5	
		Sub-total			8.75	
	Quality and availability of habitat required for mobility	Dispersal habitat availability between foraging and breeding habitat (cleared land (0) to scattered trees/shrubs (5)) x 5	25	1	25	
		Sub-total			25.00	
	Threat Abundance	Historical clearing (Abundant (0) to Absent (5)) x5	20	0.33	6.6	
		weeds and pasture grass (Abundant (0) to absent (5)) x5	20	0.33	6.6	
		Abundance of pests (feral dogs / cats) (abundant (0) to absent (5)) x5	10	0.33	3.3	
		Sub-total			16.50	
Total				6.03		