

BIODIVERSITY OFFSET PROPOSAL

PROJECT	Galilee Coal Project
PREPARED FOR	Waratah Coal Pty Ltd
PREPARED BY	Biodiversity and Carbon
DATE	March 2013



Waratah Coal Pty Ltd
Biodiversity Offset Proposal
March 2013

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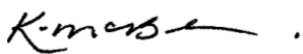
Waratah Coal Pty Ltd
Biodiversity Offset Proposal
March 2013

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EXECUTIVE SUMMARY

Waratah Coal Pty Ltd (Waratah Coal), a privately owned Australian Coal Exploration and Coal Development company, proposes to develop the Galilee Coal Project (Northern Export Facility) (the project) in Queensland. The project is expected to produce 1.4 billion tonnes of raw coal from Waratah Coal's existing tenements (EPC 1040 and part of EPC 1079) and consists of two project components:

- a new coal mine and associated infrastructure located north of the town of Alpha in the Galilee Basin
- a new rail network linking the mine to the Abbot Point State Development Area located near the town of Bowen on the east coast.

As a condition of project approval, offsets will be required to be delivered in accordance with Queensland and Australian Government offset policies where unavoidable impacts on environmental values cannot be reasonably avoided or mitigated.

A Preliminary Biodiversity Offset Proposal was prepared in December 2012 to demonstrate that, for the unavoidable impacts of the project, it is possible to deliver compliant offsets in accordance with the applicable offset policies and to fulfil Waratah Coal's voluntary commitment to provide an offset to compensate for the loss of the Bimble Box Nature Refuge (BNR).

Due to the uncertainty regarding the actual impacts associated with underground mining activities, Waratah Coal has updated the Preliminary Biodiversity Offset Proposal to reflect a staged approach to offset delivery. This approach will still involve upfront delivery of offsets for the project's rail component, open cut pits, coal preparation plants and underground mining activities proposed to occur in years 0 to 5. However, to allow for information gained from monitoring of the impacts of subsidence between years 0 and 5 to inform the offset requirements for impacts arising from underground mining activities that may occur between years 5 and 30, offsets for underground mining activities will be delivered in five yearly stages that correspond with the underground mining development sequence.

Two versions of the Biodiversity Offset Proposal (the proposal) have been prepared. One version is for agency review only and includes confidential property information. The second version (this proposal) excludes confidential property information and is suitable for public review. This publicly available version of the proposal includes:

- an explanation of how the project has been designed and located to avoid and/or minimise the extent of clearing
- identification of the impacts of the project requiring offsets, including impacts on the BNR
- summation of the offset requirements of the project under relevant Queensland and Australian Government offset policies
- the approach to offset delivery including:

- » details of direct offset options incorporating Queensland Government preferred offset options identified by the Nature Refuge team and within the strategic footprint of Galilee Basin Offset Strategy
- » alternative, or back-up, direct offset options for specific environmental values and for the replacement of the BNR
- » details of the staged approach to offset delivery.
- the proposed approach to offset implementation, including landholder engagement, field assessments, regulatory approval, development of Offset Area Management Plans (OAMPs), reporting requirements, legally binding mechanisms, and implementation of the OAMPs.

Information that has been omitted from this version of the proposal includes:

- lot on plan numbers and addresses of offset options
- property descriptions such as location adjacent to protected areas and names of watercourses
- property specific mining reports and threatened species records reports
- maps of offset properties.

In determining the impacts of the project that are likely to trigger offset requirements, impacts associated with the open cut mine areas, preparation plants, the underground long-wall mines for years 0 to 5 and the rail construction footprint have been considered. Impacts of the mine and rail components on matters of national environmental significance and on matters of state environmental significance have been assessed. The impacts of the mine and rail components of the project likely to require offsets are outlined below in **Table ES1**.

Table ES1: Impacts of the project requiring offsets

JURISDICTION	VALUE IMPACTED – MINE	VALUE IMPACTED - RAIL
Australian Government	Habitat for six threatened fauna species	Four threatened ecological communities
		Habitat for 10 threatened fauna species
Queensland Government	One threshold regional ecosystem	Three endangered regional ecosystems
		16 of concern regional ecosystems
	Habitat for 11 threatened fauna species	Two threshold regional ecosystems
	One threatened flora species	High value regrowth vegetation
	Essential habitat for 1 species	Habitat for 20 threatened fauna species
	Watercourse vegetation	Watercourse vegetation
	Connectivity	Connectivity
	Wetlands	Wetlands
	Bimblebox Nature Refuge	

Ecofund has determined the offset requirements of the project based on an assessment of project impacts against the following policies:

- *Environment Protection and Biodiversity Conservation Act 1999* Environmental Offsets Policy, 2012 (EOP)
- Queensland Government Environmental Offsets Policy, 2008 (QGEOP)
- Policy for Vegetation Management Offsets Version 3, 2011 (PVMO)
- Queensland Biodiversity Offset Policy Version 1, 2011 (QBOP)
- Marine fish habitat offset policy, 2012 (FHOP)

Ecofund has also determined the applicability of the offset policies to each of the project components (**Table ES2**).

Table ES2: Applicable offset policies

POLICY	APPLICABLE TO MINE	APPLICABLE TO RAIL
EOP	Yes	Yes
QGEOP	Yes	Yes
PVMO	No	Yes
QBOP	Likely	Likely
FHOP	No	No

While QBOP does not apply to development that is a significant project declared under section 26(1)(a) of the *State Development and Public Works Organisation Act 1971*, the Coordinator-General may use discretionary powers to require compliance with the policy as part of an approval for a significant project. It is expected that QBOP will be required to be applied to the project’s mine and rail impacts. Advice received from the Office of the Coordinator-General has indicated that offsets for the project are likely to be required to be delivered in the spirit of QBOP and not strictly in compliance with each criterion. Therefore, flexibility in the application of the policy is considered acceptable.

In addition to delivering offsets in accordance with the policies specified above, Waratah Coal is committed to voluntarily offset the BNR at an impact to offset ratio of 1:2.

Ecofund has determined that the offset requirements of the project will be acquitted through direct offsets and, if required, indirect offsets or compensatory measures. Ecofund has selected seven priority properties that contain potential offset areas to acquit the offset requirements of the project under both Queensland and Australian Government offset policies. All identified properties are located wholly or partially within areas defined in the Galilee Basin Offset Strategy and within 150 km of the project.

Based on a desktop assessment these properties have the ability to acquit the offset requirements of the project, however, further field investigations are required to confirm the suitability of the offset areas. All impacted values are represented on these properties based on spatial analysis except significant wetlands. This is likely to be due to data limitations and targeted field surveys will be undertaken to identify significant wetland areas on the ground. Ecofund has also identified a number of alternative properties, should offsets be unable to be secured on any of the priority properties due to either landholder disinterest or unsuitability as an offset.

The offset requirements for each impacted value, in terms of the areas actually required to be secured and managed on the ground will vary and field assessments will form an important component of determining the suitability of proposed offsets. The Australian Government recommends the use of the offsets assessment guide as a decision support framework in determining the suitability of offset proposals, including the appropriateness of the size of the offset. Preliminary analysis of the proposed offsets for matters of national environmental significance has been undertaken using the guide and once completed the results will be provided to the Australian Government during the assessment process.

Under Queensland Government offset policies the ecological equivalence methodology is applied to determine the suitability of a direct offset. Based on this methodology impact areas are scored and then offset areas with the same or higher score must be secured. BioCondition assessments have been undertaken at 43 sites across the project's mine footprint. The results from these BioCondition assessments will be used to inform the ecological equivalence assessments of the impact sites. Ecological equivalence assessments of the both the impact and offset sites will be undertaken in accordance with the Queensland Government's Ecological Equivalence Methodology Guideline Version 3.

Indirect offsets and/or compensatory measures will be proposed in the event that direct offsets are unable to solely fulfil the offset requirements for a particular value.

To compensate for the loss of BNR a direct offset containing similar environmental values is proposed to be secured. Property 1 is Waratah Coal's preferred property to compensate for the loss of the BNR. Property 1 contains similar vegetation and environmental values as BNR and based on discussions with the Nature Refuge Branch is suitable for gazettal as a protected area under the *Nature Conservation Act 1992*. It is also located on existing Waratah Coal mining tenements, which are proposed to be extinguished as part of offset delivery to ensure that mining could not take place on this land.

Implementation of the Biodiversity Offset Proposal will involve a number of components including:

- regulatory endorsement and project approval
- finalisation of ecological equivalence assessments of impact areas
- landholder engagement and negotiation

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- ecological equivalence and field assessments of offset areas
- offsets assessment guide calculations
- preparation of individual property reports, if required
- preparation of offset area management plans
- progress reporting to the regulators
- securing legally binding mechanisms
- implementation of the offset area management plans.

It is anticipated that Stage 1 offset implementation will be delivered in accordance with the tasks and timeframes set out in **Table ES3**.

Table ES3: Offset implementation tasks and timeframes

TASKS	TIMEFRAME
Submission of the Biodiversity Offset Proposal	March 2013
Co-ordinator Generals Report	Mid 2013
Landholder engagement and negotiation	March 2013 – ongoing
Field assessments and ecological equivalence	February 2013 – ongoing
Preparation of OAMPs	November 2013 – February 2014
Regulatory approval of OAMPs	March 2014
Securing legally binding mechanisms	March – April 2014
Implementation of OAMPs	April 2014 - ongoing

ABBREVIATION AND ACRONYMS

APSDA	Abbot Point State Development Area
BNR	Bimblebox Nature Refuge
BVG	Broad vegetation group
DEHP	Department of Environment and Heritage Protection
DERM	Department of Environment and Resource Management
DSEWPAC	Department of Sustainability, Environmental, Water, Population and Communities
E	Endangered
EIS	Environmental Impact Statement
EOP	<i>Environment Protection and Biodiversity Conservation Act 1999</i> Environmental Offsets Policy, 2012
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FHOP	Marine fish habitat offset policy, 2012
FPC	Foliage Projective Cover
GBR	Great Barrier Reef
HES	High Ecological Significance
HVR	high value regrowth
LC	Least concern
MNES	Matters of national environmental significance
MSES	Matters of state environmental significance
NC Act	<i>Nature Conservation Act 1992 (Qld)</i>
NT	Near threatened
OAMPs	Offset Area Management Plans
OC	Of concern
PMAV	Property map of assessable vegetation

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PR	Performance Requirements
PVMO	Policy for Vegetation Management Offsets Version 3, 2011
QBOP	Queensland Biodiversity Offset Policy Version 1, 2011
QGEO	Queensland Government Environmental Offsets Policy, 2008
RE	Regional ecosystem
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
SEIS	Supplementary Environmental Impact Statement
SLC	Special least concern
TEC	Threatened ecological community
The project	Galilee Coal Project
The proposal	Preliminary Biodiversity Offset Proposal
ToR	Terms of Reference
V	Vulnerable
VM Act	<i>Vegetation Management Act 1999</i>
Waratah Coal	Waratah Coal Pty Ltd

1 INTRODUCTION

1.1 Galilee Coal Project

Waratah Coal Pty Ltd (Waratah Coal), a privately owned Australian Coal Exploration and Coal Development company, proposes to develop the Galilee Coal Project (the project) in Queensland (**Figure 1**). The project is expected to produce 1.4 billion tonnes of raw coal from Waratah Coal's existing tenements (EPC 1040 and part of EPC 1079) and consists of two project components:

- a new coal mine and associated infrastructure located north of the town of Alpha in the Galilee Basin
- a new rail network linking the mine to the Abbot Point State Development Area (APSDA) located near the town of Bowen on the east coast.

The mine component consists of four underground long-wall coal mines, two open cut pits and two coal preparation plants and is located wholly within the Desert Uplands Bioregion. The proposed mine impact area consists of the mine disturbance area, which is subject to direct clearing from mine construction and operation, and the mine subsidence area above the proposed underground mining system.

The rail component consists of a railway system approximately 453 km in length. The railway easement is expected to be on average of 49.5 m wide¹. In areas where cross-slope cuttings are required the width of the easement will increase up to 150 m; with two instances up to a maximum width of 184 m (SEIS, Part A 2013). The proposed project rail impact area consists of the rail easement and associated infrastructure. The rail alignment is predominantly located in the Brigalow Belt Bioregion; however part of the western end of the alignment is located in the Desert Uplands Bioregion.

1.2 Approval process

In November 2008, the Queensland Government declared the project a 'significant project' pursuant to Part 4, section 26(1)(a) of the *State Development and Public Works Organisation Act 1971* (SDPWO Act). As such, an Environmental Impact Statement (EIS) was required in accordance with section 26(1)(a) of the SDPWO Act.

In March 2009 the project was declared a 'controlled action' by the then Australian Government Minister for the Environment, Water, Heritage and the Arts, due to likely potential impacts on matters of national environmental significance (MNES). The project therefore requires assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the controlling provisions are:

- sections 12 and 15A (World Heritage properties)
- sections 15B and 15C (National Heritage places)
- sections 18 and 18A (listed threatened species and communities)

¹ Average width was calculated by dividing the total rail footprint (2215 ha) by the length of the rail (453 km)

- sections 20 and 20A (listed migratory species)
- Commonwealth marine areas

In accordance with the Terms of Reference² (ToR) issued by the Coordinator-General in August 2009, Waratah Coal prepared an EIS to assess the environmental, social and economic impacts associated with the project. The project's draft EIS report was submitted to the Queensland and Australian Governments in September 2011 and was available for public review for 12 weeks, attracting 1,842 submissions. Following an evaluation of the submissions on the EIS, it was determined that a Supplementary EIS (SEIS) was required to address matters raised during the public consultation period.

1.3 Biodiversity Offset Proposal

As a condition of project approval, offsets will be required to be delivered in accordance with Queensland and Australian Government offset policies where unavoidable impacts on environmental values cannot be reasonably avoided or mitigated.

A Preliminary Biodiversity Offset Proposal was prepared in December 2012 to demonstrate that, for the unavoidable impacts of the project, it is possible to deliver compliant offsets in accordance with the applicable offset policies and to fulfil Waratah Coal's voluntary commitment to provide an offset to compensate for the loss of the Bimblebox Nature Refuge (BNR). The Preliminary Biodiversity Offset Proposal adopted a conservative assessment of potential project impacts by considering that all vegetation within the mine (open cut and underground mining areas) and rail footprint would be lost as a result of the project. The conservative assessment of project impacts assumed that subsidence above underground mining operations would result in the entire loss of environmental values.

Due to the uncertainty regarding the actual impacts associated with underground mining activities, Waratah Coal has updated the Preliminary Biodiversity Offset Proposal to reflect a staged approach to offset delivery. This approach will still involve upfront delivery of offsets for the project's rail component, open cut pits, coal preparation plants and underground mining activities proposed to occur in years 0 to 5. However, to allow for information gained from monitoring of the impacts of subsidence between years 0 and 5 to inform the offset requirements for impacts arising from underground mining activities that may occur between years 5 and 30, offsets for underground mining activities will be delivered in five yearly stages that correspond with the underground mining development sequence.

Two versions of the Biodiversity Offset Proposal (the proposal) have been prepared. One version is for agency review only and includes confidential property information. The second version (this proposal) excludes confidential property information and is suitable for public review. This publicly available version of the proposal includes:

- an explanation of how the project has been designed and located to avoid and/or minimise the extent of clearing

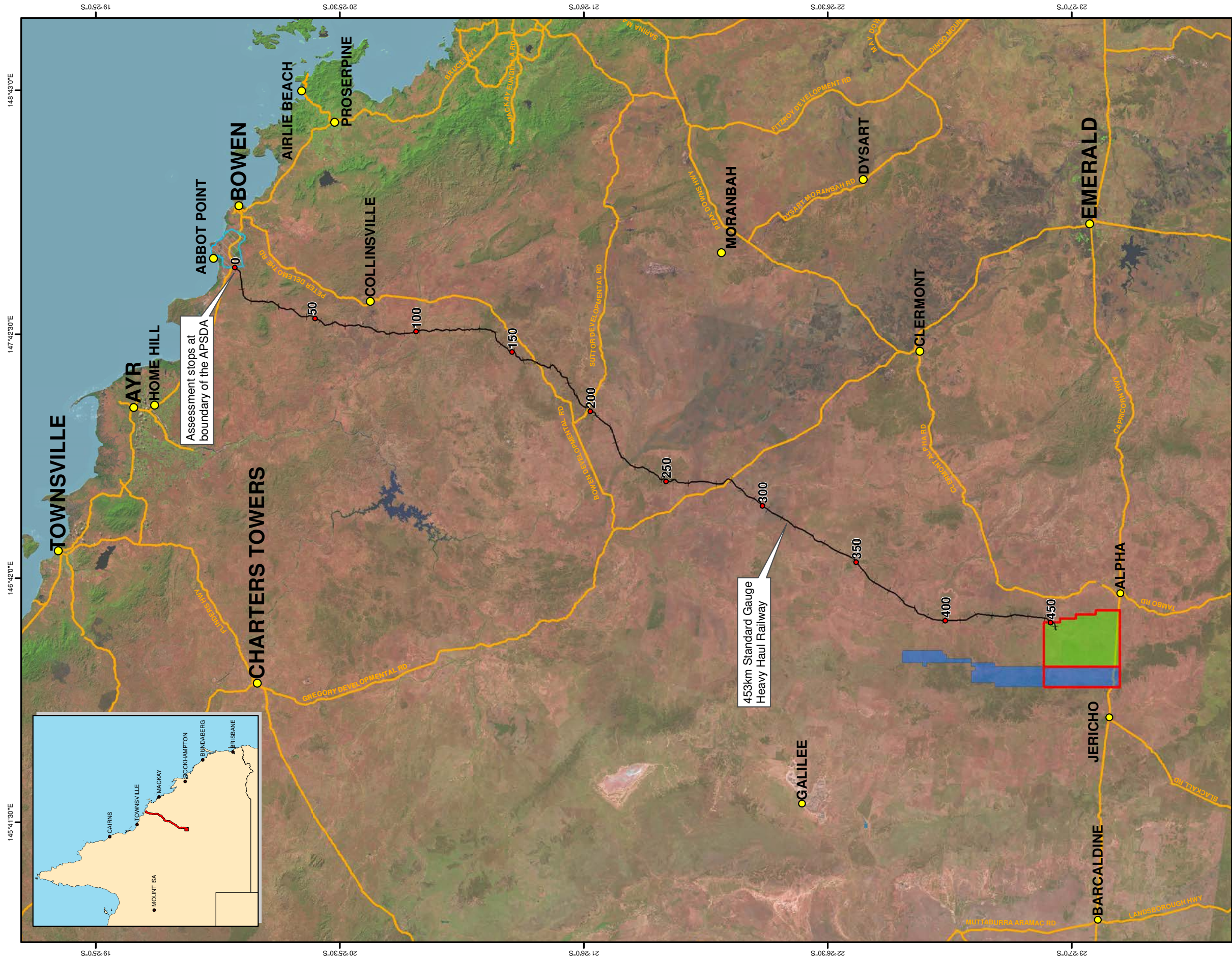
² One joint ToR was issued on behalf of both the Queensland and Australian Governments

- identification of the impacts of the project requiring offsets, including impacts on the BNR
- summation of the offset requirements of the project under relevant Queensland and Australian Government offset policies
- the approach to offset delivery including:
 - » details of direct offset options incorporating Queensland Government preferred offset options identified by the Nature Refuge team and within the strategic footprint of Galilee Basin Offset Strategy
 - » alternative, or back-up, direct offset options for specific environmental values and for the replacement of the BNR
 - » details of the staged approach to offset delivery.
- the proposed approach to offset implementation, including landholder engagement, field assessments, regulatory approval, development of Offset Area Management Plans (OAMPs), reporting requirements, legally binding mechanisms, and implementation of the OAMPs.

Information that has been omitted from this version of the proposal includes:

- lot on plan numbers and addresses of offset options
- property descriptions such as location adjacent to protected areas and names of watercourses
- property specific mining reports
- property specific threatened species records reports
- maps of offset properties.

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**FIGURE 1:
PROJECT
REGIONAL
CONTEXT**

Arterial Road

- Abbot Point State Development Area
- 50km Marker Point
- Proposed Rail Alignment (03.05.2012)
- Exploration Permit Coal (EPC) 1040
- Exploration Permit Coal (EPC) 1079

0 20 40 60 80
Kilometres

A3 Scale 1:1,500,000

Coordinate System: GCS GDA 1984

Source: Landsat Image Geoscience Australia 2005
© 2012 Waratah Coal Pty Ltd 2012
Abbot Point State Development Area, Moola 2009

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GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Mineralogy House, Level 7, 300 Queen Street, Brisbane, QLD 4000, Australia

2 METHODS

2.1 Environmental impacts

Project impact data obtained from Waratah Coal included impacts associated with the open cut mine areas and preparation plants and the rail construction footprint and associated infrastructure. For the mine, flora and fauna impact data was obtained from the flora and vegetation reports (Friend 2012; O2 Ecology 2012) and fauna report (Agnew 2012a) included in the SEIS. All other mine impacts were derived from a desktop assessment using relevant data sources as outlined in **Table 1**.

Impacts associated with underground mining activities in relation to seams B and D for the 0 to 5 year panels were calculated by Ecofund based on a desktop assessment. Spatial data representing the underground mining footprint was provided by Waratah Coal. Impacts associated with underground mining activities have been overestimated as the open cut mine footprint overlaps with the long-wall mining panels and this overlap was not taken into consideration. As such, impacts associated with underground mining activities as presented in this proposal should be considered a guide only and will be further refined.

Table 1: Data sources for mine related environmental impacts

VALUE TO BE OFFSET	DATA SOURCE
Threatened ecological communities (TEC)	The regional ecosystems analogous with each TEC (regional ecosystem analogues obtained from review of the Department of Sustainability, Environmental, Water, Population and Communities (DSEWPAC) listing advice for TEC)
Threatened fauna	Identified in Agnew 2012a (see SEIS Appendices)
Regional ecosystems	Vegetation Management Act Regional Ecosystems V 6.1 - Brigalow Belt and New England Tablelands ; Vegetation Management Act Regional Ecosystems V 6.1 - Western (South)
Threatened flora	Identified in Friend 2012
Essential habitat	Vegetation Management Act Essential Habitat - V 3.1 (polygons only), 16 September 2011
Watercourse vegetation	Vegetation Management Act Queensland Regrowth Watercourses Version 2.1; Vegetation Management Act Regional Ecosystems V 6.1 - Brigalow Belt and New England; and Vegetation Management Act Regional Ecosystems V 6.1 - Western (South)
Connectivity	Vegetation Management Act Regional Ecosystems V 6.1; Vegetation Management Act High Value Regrowth V2.1

VALUE TO BE OFFSET	DATA SOURCE
Wetlands	Great Barrier Reef (GBR) Wetland Protection Area trigger areas; GBR Wetland Protection Area of High Ecological Significance (HES); Department of Environment and Resource Management Wetland Data – Wetlands; Ground survey data for Lacustrine Waterbodies provided by Rob Friend and Associates

Fauna habitat impacts associated with the mine considers primary habitat only, and does not consider impacts on secondary habitat areas³. Areas considered to have primary habitat values comprised a combination of:

- species recorded within a suitable regional ecosystem (RE) type on the study site
- species recorded within RE type within the Desert Uplands Bioregion
- habitat that supports species-specific essential conditions and/or resources for the species
- habitat type is >50ha in area and/or ecologically connected with other remnant REs.

For the rail, all impact data was derived from a desktop assessment of relevant data as outlined in **Table 2**.

Table 2: Data sources for rail related environmental impacts

VALUE TO BE OFFSET	DATA SOURCE
Threatened ecological communities	The REs analogous with each TEC (obtained from review of the DSEWPAC listing advice for TEC)
Threatened fauna	Derived from Agnew 2012b (see Appendix A of this report)
Regional ecosystems	Vegetation Management Act Regional Ecosystems V 6.1 - Brigalow Belt and New England Tablelands; and Vegetation Management Act Regional Ecosystems V 6.1 - Western (North)
High value regrowth	Vegetation Management Act High Value Regrowth Vegetation V 2.1
Threatened flora	TBC
Essential habitat	Vegetation Management Act Essential Habitat - V 3.1 (polygons only), 16 September 2011
Watercourse vegetation	Vegetation Management Act Queensland Regrowth Watercourses V 2.1; Vegetation Management Act Regional Ecosystems V 6.1 - Brigalow

³ Areas considered to have secondary habitat values comprised a combination of: species recorded within a suitable RE type within the Desert Uplands Bioregion; habitat where species-specific essential conditions and/or resources were either depauperate or absent; habitat type is <50ha in area and/or does not interface with other remnant REs.

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 Biodiversity Offset Proposal
 March 2013

VALUE TO BE OFFSET	DATA SOURCE
	Belt and New England; and Vegetation Management Act Regional Ecosystems V 6.1 - Western (North)
Connectivity	Vegetation Management Act Regional Ecosystems V 6.1; Vegetation Management Act High Value Regrowth V2.1
Wetlands	TBC

Fauna habitat impacts associated with the rail were calculated using modelling to determine habitat values for the suite of threatened fauna species that are known to occur, or may occur along the rail. Modelling involved determining the likelihood of occurrence of a species and modelling its habitat to provide an area of primary and secondary habitat for each species. The full methodology for the fauna habitat calculations for the rail is provided in **Appendix A**. Impacts on fauna habitat for the rail component of the project considers both primary and secondary habitat as a precautionary approach, given that no ground truthing has occurred.

2.2 Offset requirements

Ecofund has determined the offset requirements of the project based on a review of the following policies and their applicability to the mine and rail components of the project:

- *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy, 2012 (EOP)*
- Queensland Government Environmental Offsets Policy, 2008 (QGEOP)
- Policy for Vegetation Management Offsets Version 3, 2011 (PVMO)
- Queensland Biodiversity Offset Policy Version 1, 2011 (QBOP)
- Marine fish habitat offset policy, 2012 (FHOP)

2.3 Offset identification

- Ecofund has estimated the potential offset areas available for each environmental value based on a desktop assessment.
- All potential offset areas have been identified on lots located wholly or partially within the strategic footprints outlined in the Galilee Basin Offset Strategy (DNRM et al. 2012).
- All potential offset areas are lands lease, leasehold or freehold tenure and are greater than 2 ha; small fragments less than 1 ha have not been included.
- Offset identification is based on lots, not properties. That is, some properties consist of more than one lot.
- Lots mapped as Queensland Estate and other land (DERM 2011a), protected areas of Queensland (DERM 2012a) and parts of lots declared as nature refuges (DERM 2012b), strategic cropping trigger areas (DERM 2011b) or existing mining leases (DME 2012) current as of August 2012 have not been included.

- REs used in each search have been obtained from those suitable to acquit the offset requirement as per the relevant policy. These were sourced from *Vegetation Management Act 1999* (VM Act) Essential Habitat Factors, wetland REs described in the relevant Regional Vegetation Management Code and Species Profile and Threats Database produced by the Department of Sustainability, Environment, Water, Population and Communities and from information provided by the project's fauna ecologist.
- For offset requirements under the PVMO or the QBOP, potential areas contain suitable environmental values mapped as non-remnant, high value regrowth (HVR) vegetation or Category X on a property map of assessable vegetation (PMAV). These areas do not include HVR that is:
 - » an endangered RE on freehold or indigenous land
 - » an endangered or of concern RE on leasehold land (agriculture and grazing)
 - » essential regrowth habitat
 - » within a wetland protection area.
- For offset requirements under the EPBC Act, potential areas contain suitable environmental values mapped as remnant, non-remnant, HVR vegetation or Category X on a PMAV.
- Foliage Projective Cover (FPC) 2010 data (DERM 2012c) showing areas mapped as containing greater than 6% FPC has been used to further refine the available offset areas.

2.4 Limitations

- This is a desktop assessment only. The offset potential of the identified values is subject to on-ground verification of environmental values.
- Some areas may include non-compliant HVR vegetation which is within a stream protection zone or on a slope greater than 12%. Excluding these areas requires a higher level of analysis. This impacts PVMO and QBOP potential offset areas.
- Offsets for impacts to significant wetlands have been sourced from wetland REs listed in the relevant Regional Vegetation Management Code. On ground verification of these areas is required to ensure compliance with the definition of significant wetlands.
- It is likely that some properties contain wetland areas that have not been identified through desktop assessment. Field assessments will be required to determine actual availability of wetland areas.
- Desktop watercourse offset assessments are limited as available drainage data is incomplete, particularly within the Desert Uplands Bioregion. It is highly likely that all identified properties have watercourses with at least a stream order 3 that has not been mapped. On-ground verification of the ordered drainage is therefore required.

- Some offset areas may not meet the policy requirement to be greater than 10 ha or connected to existing remnant vegetation that is in total greater than 10 ha.
- Potential offset areas may include areas which have conflicting land uses, such as agriculture and mining interests not on mining lease title.
- Landowners who own or lease these lots may not be interested in using parts of their land as an environmental offset.
- Some areas may be cleared and therefore may not meet the PVMO and QBOP requirement of containing functional REs. Other areas may be partially cleared and require extensive revegetation. However, this has been minimised by integrating the FPC $\geq 6\%$ criterion.
- For Queensland Government requirements, ecological equivalence assessments will need to be undertaken to determine the suitability of the offset and the size of the offset required for each impact.

3 AVOIDANCE AND MITIGATION

As a condition of project approval, offsets will be required to be delivered under Queensland and Australian Government offset policies where unavoidable impacts to identified ecological values cannot be reasonably avoided or mitigated. In accordance with Principle 2 of QGEOP, offsets are required when a project has demonstrated to the regulator that all practical and reasonable efforts have been taken to avoid and minimise impacts on identified ecological values but a residual impact remains. Similarly, the Australian Government's EOP states that offsets can compensate for any residual impacts only after all reasonable avoidance and mitigation measures have been identified.

The project mine has been located so as to extract the highest quality and shallowest coal reserves within Waratah Coal's existing tenements (EPC 1040 and part of EPC 1079). Access to these reserves, which are predominantly located beneath the BNR, is critical to the project's viability as they are the most cost effective of all reserves within the mining lease to recover. If these reserves are not mined the project becomes unviable. Although there are unavoidable direct impacts associated with the mine, the majority of the mine area consists of least concern REs (EIS, Executive Summary: 36).

Impacts on vegetation remaining above the underground mine area will be mitigated through the development and implementation of a Vegetation Management Plan and impacts on individual species will be mitigated through the implementation of Significant Species Management Plans. A Decommissioning and Rehabilitation Plan will make provision for progressive rehabilitation of land upon cessation of mining activities. Creek diversions have been designed with the inclusion of channel features (such as pools and riffles) to provide habitat and maintain connectivity. The creek diversions include revegetation plans and monitoring programs and assessment of indicators such as structural stability of vegetation, vegetation health and growth rate and longitudinal connectivity of vegetation.

Clearing along the rail corridor will be limited to the amount necessary to undertake earthworks and the construction corridor width will be minimised where possible (EIS, Executive Summary: 51). At present, the majority of REs within the rail area are least concern (EIS, Executive Summary: 52). It is anticipated that there could be threatened flora species recorded during detailed corridor surveys, which may be avoided by alignment refinements (EIS, Executive Summary: 53). The current alignment has sought to minimise the loss of potential threatened fauna species habitat within the local area. Further mitigation measures will include strategic preservation of significant features, such as habitat trees, rehabilitation of disturbed areas, and the implementation of Species Specific Management Plans.

4 IMPACTS OF THE MINE REQUIRING OFFSETS

4.1 Matters of national environmental significance

The following section outlines all MNES that are expected to be impacted by construction and operation of the project’s mine component. Impact areas include direct clearing of vegetation and subsidence associated with the proposed underground mining system for activities occurring in years 0 to 5. Impacts associated with underground mining activities and presented here as subsidence impacts have been overestimated as the open cut mine footprint overlaps with the long wall mining panels and this overlap was not taken into consideration. As such, impacts associated with underground mining activities as presented in the following section should be considered a guide only and will be further refined.

The construction and operation of the mine is not expected to impact on:

- listed threatened flora
- threatened ecological communities
- World Heritage properties
- National Heritage places
- wetlands of international importance (Ramsar wetlands)
- the Commonwealth marine environment
- the Great Barrier Reef (GBR) Marine Park.

There are not considered to be any significant impacts on listed migratory species protected under the EPBC Act.

4.1.1 Threatened fauna

Habitat for six EPBC Act listed threatened fauna species has been identified in the mine disturbance and subsidence areas (**Table 3**). Impacts on threatened fauna habitat are not cumulative as some species occur within the same area.

Table 3: Mine impacts on EPBC Act listed threatened fauna species

SPECIES	EPBC ACT STATUS	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Brigalow Scaly-foot <i>Paradelma orientalis</i>	V	1,473.31	801.04	2,274.35
Yakka Skink <i>Egernia rugosa</i>	V	1,422.18	801.04	2,223.22
Squatter Pigeon (sth. subsp.) <i>Geophaps scripta scripta</i>	V	2,789.24	801.04	3,590.28

SPECIES	EPBC ACT STATUS	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Ornamental Snake <i>Denisonia maculate</i>	V	33.73	0.00	33.73
Black-throated Finch (sth. subsp.) <i>Peophila cincta cincta</i>	E	2,789.24	801.04	3,590.28
Northern Quoll <i>Dasyurus hallucatus</i>	E	84.38	2.15	86.53

4.2 Matters of state environmental significance

The following sections describe the residual impacts on matters of state environmental significance (MSES) associated with the construction and operation of the project's mine component which are required to be offset under Queensland Government legislation. This includes impacts from both direct clearing and subsidence impacts associated with the proposed underground mining system for activities occurring in years 1 to 5.

4.2.1 Threshold regional ecosystems

One threshold RE is expected to be impacted by direct clearing associated with the project's mine component (**Table 4**).

Table 4: Mine impacts on threshold regional ecosystems

RE	DESCRIPTION	VM ACT CLASS	BVG	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)
11.5.5	<i>Eucalyptus melanophloia</i> , <i>Callitris glaucophylla</i> woodland	LC	17b	7.11	0.00

4.2.2 Threatened fauna

Habitat for 11 *Nature Conservation Act 1992* (NC Act) listed threatened or conservation significant fauna species has been identified in the mine clearing and subsidence areas (**Table 5**). Impacts on threatened fauna habitat are not cumulative as some species occur within the same area.

Table 5: Mine impacts on NC Act threatened fauna species

SPECIES	NC ACT STATUS	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Koala <i>Phascolarctos cinereus</i>	SLC	4,741.97	716.62	5,458.59
Brigalow Scaly-foot <i>Paradelma orientalis</i>	V	1,473.31	801.04	2,274.35

SPECIES	NC ACT STATUS	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Yakka Skink <i>Egernia rugosa</i>	V	1,422.18	801.04	2,223.22
Squatter Pigeon (sth. subsp.) <i>Geophaps scripta scripta</i>	V	2,789.24	801.04	3,590.28
Ornamental Snake <i>Denisonia maculata</i>	V	33.73	0.00	33.73
Black-throated Finch (southern) <i>Peophila cincta cincta</i>	E	2,789.24	801.04	3,590.28
Little Pied Bat <i>Chalinolobus picatus</i>	NT	1,434.71	801.04	2,235.75
<i>Ctenotus capricorni</i>	NT	3,216.22	795.40	4,011.62
Square-tailed Kite <i>Lophoictinia isura</i>	NT	4,741.97	801.04	5,543.01
Black-chinned Honeyeater <i>Melithreptus gularis</i>	NT	4,599.80	801.04	5,400.84
Common Death Adder <i>Acanthophis antarcticus</i>	NT	669.00	798.35	1,467.35

4.2.3 Threatened flora

One NC Act listed threatened flora species, *Desmodium macrocarpum*, is expected to be impacted by the project's mine component. A total of 135 individuals were identified during field surveys (Friend 2012) (Table 6).

Table 6: Mine impacts on NC Act threatened flora species

SPECIES	NC ACT STATUS	NO OF INDIVIDUALS
<i>Desmodium macrocarpum</i>	NT	135

4.2.4 Essential habitat

Essential habitat for one NC Act listed threatened fauna species is expected to be impacted by the project's mine component (Table 7).

Table 7: Mine impacts on essential habitat

SPECIES	NC ACT STATUS	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
<i>Desmodium macrocarpum</i>	NT	487.28	0.16	487.44

4.2.5 Watercourse vegetation

Direct clearing and subsidence associated with the construction and operation of the mine is expected to impact on approximately 955 ha of watercourse vegetation (**Table 8**).

Table 8: Mine impacts on remnant watercourse vegetation

STREAM ORDER	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Stream order 1	166.82	20.31	187.13
Stream order 2	6.68	0.00	6.68
Stream order 3	3.70	7.61	11.31
Stream order 4	57.78	0.00	57.78
Stream order 5	220.88	0.00	220.88
Total	455.86	27.92	483.78

4.2.6 Connectivity

The project's mine component is expected to impact on landscape connectivity including up to 5722 ha of vegetation (**Table 9**).

Table 9: Mine impact on connectivity

ENVIRONMENTAL VALUE	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Connectivity	4,921.61	801.04	5,722.65

4.2.7 Wetlands

The project's mine component is expected to impact on Wetland Protection Area trigger areas and significant wetlands (**Table 10**). The trigger wetland of high ecological significance is located within the southern section of the mines clearing footprint and consists of RE 10.3.14h.

Table 10: Mine impacts on wetlands

WETLAND TYPE	CLEARING AREA (HA)	SUBSIDENCE AREA (HA)	TOTAL AREA (HA)
Wetland Protection Areas	126.63	0.00	126.63
Significant wetlands	52.62	0.00	52.62

4.3 Bimblebox Nature Refuge

The BNR, listed in Schedule 5 of the Nature Conservation (Protected Areas) Regulations 1994, occupies an area of approximately 8,000 ha within EPC 1040. The BNR is expected to be impacted by mine construction and operation through both direct vegetation clearing and subsidence resulting from underground mining activities. The level of impact associated with subsidence is currently unknown. The area to be cleared to facilitate the open cut mines and supporting infrastructure is approximately 4,017 ha. An additional 3,422 ha will be subject to subsidence from the underground mining activities. As a result of these impacts the Nature Refuge status of the property is likely to be removed (Friend 2012).

Table 11 provides a summary of the mapped vegetation communities present within the BNR, based on an assessment of the RE mapping (Version 6.1). Vegetation survey work undertaken in the second half of 2012 determined that RE mapping was generally consistent with the vegetation on the ground with only a few minor inconsistencies (Friend 2012; O2 Ecology 2012).

Table 11: Mapped vegetation within the Bimblebox Nature Refuge

ENVIRONMENTAL VALUE VM ACT STATUS	RE / SPECIES	DESCRIPTION	IMPACT AREA (HA)
Least concern remnant vegetation	10.3.27a	<i>Eucalyptus populnea</i> open-woodland on alluvial plains	1,221.15
	10.3.12a	<i>Corymbia plena</i> open-woodland on sandy alluvial terraces (eastern)	17.31
	10.3.3b	<i>Acacia harpophylla</i> low open-woodland to open-woodland on alluvial plains	8.65
	10.3.28a	<i>Eucalyptus melanophloia</i> open woodland on sandy alluvial fans	268.51
	10.5.5a	<i>Eucalyptus melanophloia</i> open woodland on sand plains	5,414.50
	10.5.12	<i>Eucalyptus populnea</i> open woodland on sand plains	601.61
Least concern non-remnant vegetation	10.3.27a	<i>Eucalyptus populnea</i> open-woodland on alluvial plains	13.69
	10.3.12a	<i>Corymbia plena</i> open-woodland on sandy alluvial terraces (eastern)	0.01
	10.3.3b	<i>Acacia harpophylla</i> low open-woodland to open-woodland on alluvial plains	0.01
	10.3.28a	<i>Eucalyptus melanophloia</i> open woodland on sandy alluvial fans	3.40
	10.5.5a	<i>Eucalyptus melanophloia</i> open woodland on sand plains	329.71

ENVIRONMENTAL VALUE VM ACT STATUS	RE / SPECIES	DESCRIPTION	IMPACT AREA (HA)
	10.5.12	<i>Eucalyptus populnea</i> open woodland on sand plains	36.64
Least concern HVR vegetation	10.3.27a	<i>Eucalyptus populnea</i> open-woodland on alluvial plains	3.23
	10.3.28a	<i>Eucalyptus melanophloia</i> open woodland on sandy alluvial fans	0.81
	10.5.5a	<i>Eucalyptus melanophloia</i> open woodland on sand plains	7.39
	10.5.12	<i>Eucalyptus populnea</i> open woodland on sand plains	0.82
Essential habitat	<i>Desmodium macrocarpum</i>	Large-podded trefoil. Grows in open Eucalypt forest, in vine thicket and Eucalypt woodland.	802.00

5 IMPACTS OF THE RAIL REQUIRING OFFSETS

5.1 Matters of national environmental significance

The following section outlines all MNES that are expected to be impacted by construction and operation of the project's rail component. Impact areas are those affected by direct clearing of vegetation. The construction and operation of the rail is not expected to impact on:

- World Heritage properties
- National Heritage places
- the Commonwealth marine environment
- the Great Barrier Reef (GBR) Marine Park.

There are not considered to be any significant impacts on listed migratory species protected under the EPBC Act.

5.1.1 Threatened ecological communities

Four threatened ecological communities listed under the EPBC Act are expected to be impacted by the project's rail component (**Table 12**).

Table 12: Rail impacts on EPBC Act listed threatened ecological communities

ECOLOGICAL COMMUNITY	EPBC ACT STATUS	CLEARING AREA (HA)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	E	30.02
Weeping Myall Woodlands	E	23.42
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	E	1.94
Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	E	21.36

5.1.2 Threatened fauna

Habitat for 10 EPBC Act listed threatened fauna species is expected to be impacted by the project's rail component (**Table 13**). Impacts on threatened fauna habitat are not cumulative as some species occur within the same area.

Table 13: Rail impacts on EPBC Act listed threatened fauna species

SPECIES	EPBC ACT STATUS	CLEARING AREA (HA)
Ornamental Snake <i>Denisonia maculata</i>	V	185.29
Black-throated Finch <i>Poephila cincta cincta</i>	E	103.21
Brigalow Scaly-foot <i>Paradelma orientalis</i>	V	609.33
Northern Quoll <i>Dasyurus hallucatus</i>	E	291.41
Striped-tailed <i>Delma Delma labialis</i>	V	402.13
Yakka Skink <i>Egernia rugosa</i>	V	1,138.00
Dunmall's Snake <i>Furina dunmalli</i>	V	105.28
Red Goshawk <i>Erythroriorchis radiatus</i>	V	504.01
Australian Painted Snipe <i>Rostratula australis</i>	V	7.86

5.2 Matters of state environmental significance

The following section outlines the residual impacts from the construction and operation of the project's rail component that are required to be offset under Queensland Government legislation. Impact areas are those affected by direct clearing of vegetation. As the rail alignment passes through both the Desert Uplands Bioregion and the Brigalow Belt Bioregion some impacts occur in each Bioregion. Further survey efforts are required to determine impacts on:

- wetlands protected by the VM Act, including significant wetlands
- threatened flora species listed under the NC Act.

Waratah Coal propose to undertake these surveys in 2013.

5.2.1 Endangered and of concern regional ecosystems

Three endangered REs and 16 of concern REs as protected under the VM Act are expected to be impacted by the project's rail component, totalling an area of approximately 134 ha (**Table 14**).

Table 14: Rail impacts on endangered and of concern regional ecosystems

RE	DESCRIPTION	VM ACT CLASS	BVG	CLEARING AREA (HA)
11.3.1	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	E	25a	9.37
11.4.8	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	E	25a	23.18
11.4.9	<i>Acacia harpophylla</i> shrubby open forest to woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	E	25a	2.56
11.3.2	<i>Eucalyptus populnea</i> woodland on alluvial plains	OC	17a	18.26
11.3.3	<i>Eucalyptus coolabah</i> woodland on alluvial plains	OC	16c	23.21
11.3.33	<i>Eremophila mitchellii</i> open woodland on alluvial plains	OC	26a	2.25
11.3.4	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains	OC	16c	24.08
11.4.5	<i>Acacia argyrodendron</i> woodland on Cainozoic clay plains	OC	26a	4.81
11.4.6	<i>Acacia cambagei</i> woodland on Cainozoic clay plains	OC	26a	0.53
11.4.11	<i>Dichanthium sericeum</i> , <i>Astrebla</i> spp. and patchy <i>Acacia harpophylla</i> , <i>Eucalyptus coolabah</i> on Cainozoic clay plains	OC	30b	2.29
11.5.10	<i>Melaleuca tamariscina</i> shrubland on Cainozoic sand plains/remnant surfaces	OC	21b	2.19
11.9.10	<i>Acacia harpophylla</i> , <i>Eucalyptus populnea</i> open forest on fine-grained sedimentary rocks	OC	25a	7.76
11.11.13	<i>Acacia harpophylla</i> or <i>A. argyrodendron</i> , <i>Terminalia oblongata</i> low open forest on deformed and metamorphosed sediments and interbedded volcanics	OC	25a	5.02
11.11.16	<i>Eucalyptus cambageana</i> , <i>Acacia harpophylla</i> woodland on old sedimentary rocks with varying degrees of metamorphism and folding	OC	25a	1.47
11.12.10	<i>Corymbia clarksoniana</i> woodland on igneous rocks	OC	9c	2.61
11.12.14	<i>Lophostemon</i> spp. woodland on igneous rocks	OC	28e	1.18
11.12.15	<i>Allocasuarina torulosa</i> , <i>Livistona drudei</i> woodland on igneous rocks	OC	27c	1.58
11.12.16	<i>Acacia</i> spp. low woodland on igneous rocks.	OC	24a	1.58
11.12.18	Montane shrubland on igneous rocks	OC	29b	0.39
Total				134.32

5.2.2 Threshold regional ecosystems

Two threshold REs are expected to be impacted by the project's rail component with a total clearing area of approximately 10 ha (**Table 15**).

Table 15: Rail impacts on threshold regional ecosystems

RE	DESCRIPTION	VM ACT CLASS	BVG	CLEARING AREA (HA)
11.3.5	<i>Acacia cambagei</i> woodland on alluvial plains	LC	26a	9.16
11.5.5	<i>Eucalyptus melanophloia</i> , <i>Callitris glaucophylla</i> woodland on Cainozoic sand plains/remnant surfaces. Deep red sands	LC	17b	1.04
Total				10.20

5.2.3 High value regrowth

Approximately 9 ha of regulated HVR vegetation is expected to be impacted by the project's rail component (**Table 16**).

Table 16: Rail impacts on endangered and of concern high value regrowth

BVG	VM ACT CLASS	CLEARING AREA (HA)
25a	E	1.91
26a	OC	3.46
25a	OC	1.15
27c	OC	0.67
24a	OC	0.67
28e	OC	0.50
29b	OC	0.17
Total		8.53

5.2.4 Threatened fauna

Habitat for 20 NC Act listed threatened or conservation significant fauna species is expected to be impacted by the project's rail component (**Table 17**). Impacts on threatened fauna habitat are not cumulative as some species occur within the same area.

Table 17: Rail impacts on NC Act threatened fauna species

SPECIES	NC ACT STATUS	CLEARING AREA (HA)
Ornamental Snake <i>Denisonia maculata</i>	V	185.29
Black-throated Finch <i>Poephila cincta cincta</i>	E	103.21
Brigalow Scaly-foot <i>Paradelma orientalis</i>	V	609.33
Spotted-tailed Quoll <i>Dasyurus maculatus maculates</i>	E	291.41
Striped-tailed Delma <i>Delma labialis</i>	V	402.13
Yakka Skink <i>Egernia rugosa</i>	V	1,138.00
Dunmall's Snake <i>Furina dunmali</i>	V	105.28
Red Goshawk <i>Erythroriorchis radiatus</i>	V	504.01
Australian Painted Snipe <i>Rostratula australis</i>	V	7.86
Koala <i>Phascolarctos cinereus</i>	SLC	854.23
Little Pied Bat <i>Chalinolobus picatus</i>	NT	854.23
Common Death Adder <i>Acanthophis antarcticus</i>	NT	99.59
Rough Frog <i>Cyclorana verrucosa</i>	NT	47.85
Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	NT	7.86
Freckled Duck <i>Stictonetta naevosa</i>	NT	7.86
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	NT	7.86
Grey Goshawk <i>Accipiter novaehollandiae</i>	NT	489.69
Square-tailed Kite <i>Lophoictinia isura</i>	NT	407.91
Glossy Black Cockatoo <i>Calyptorhynchus lathami</i>	V	76.87
Black-chinned Honeyeater <i>Melithreptus gularis</i>	NT	407.91

5.2.5 Watercourse vegetation

Approximately 90 ha of watercourse vegetation is expected to be impacted by the project’s rail component (**Table 18**).

Table 18: Rail impacts on remnant watercourse vegetation

STREAM ORDER	CLEARING AREA BRIGALOW BELT BIOREGION (HA)	CLEARING AREA DESERT UPLANDS BIOREGION (HA)
Stream order 1	23.82	6.31
Stream order 2	17.98	0.78
Stream order 3	26.28	-
Stream order 4	1.36	0.68
Stream order 5	1.63	-
Stream order 6	7.97	1.85
Stream order 8	-	1.23
Total	79.04	10.85

5.2.6 Connectivity

The construction and operation of the project’s rail component has the potential to impact on landscape connectivity including 2,234 ha of vegetation (**Table 19**).

Table 19: Rail impacts on connectivity

ENVIRONMENTAL VALUE	CLEARING AREA (HA)
Connectivity	2,234.07

5.2.7 Wetlands

Direct clearing associated with the project’s rail component is expected to impact on approximately 108 ha of Wetland Protection Area trigger areas (**Table 20**). The trigger wetland of high ecological significance is located in the northern section of the rail alignment and consists of 1.19 ha of RE 11.3.25. The rail alignment does not directly impact the HES wetland.

Table 20: Rail impacts on wetland protection areas

WETLAND TYPE	CLEARING AREA (HA)
Wetland Protection Areas	107.50

6 OFFSET REQUIREMENTS

6.1 Applicable offset polices

The project’s terms of reference, released in August 2009, require the ‘identification of potential offset areas, in an ‘offset strategy’, consistent with QGEOP specific-issues offsets policies, to compensate for any loss of vegetation’. In addition, ‘offsets must be discussed with regard to impacts on EPBC matters’. Based on an assessment of the residual impacts of the project the following Queensland and Australian Government offset policies⁴ are likely to apply:

- EPBC Act Environmental Offsets Policy, 2012
- Queensland Government Environmental Offsets Policy, 2008
- Policy for Vegetation Management Offsets Version 3, 2011
- Queensland Biodiversity Offset Policy Version 1, 2011.

Table 21 provides a summary of the applicability of each of the relevant offset polices to the two project components.

Table 21: Offset policy applicability to project component

POLICY	APPLICABLE TO MINE	APPLICABLE TO RAIL
EOP	Yes	Yes
QGEOP	Yes	Yes
PVMO	No	Yes
QBOP	Yes	Yes

In addition to delivering offsets in accordance with the policies specified above, Waratah Coal has committed to voluntarily offset the BNR.

The offset requirements under each policy are presented in terms of the minimum offset area for each environmental value, based on the impacts outlined in **Sections 4** and **5**. For mine related offsets the minimum offset area includes offsets for impacts from direct clearing and subsidence associated with underground mining activities for years 0 to 5. The offset requirements for each value, in terms of the areas actually required to be secured and managed on the ground will vary and field assessments will form an important component of determining the suitability of proposed offsets.

The Australian Government recommends the use of the offsets assessment guide as a decision support framework in determining the suitability of offset proposals, including the appropriateness of the size of the offset. Preliminary analysis of the proposed offsets for MNES has been undertaken using the guide and once completed the results will be provided to the Australian Government during the assessment process.

⁴ Policies current at time of writing and are subject to change.

Under Queensland Government offset policies the ecological equivalence methodology is applied to determine the suitability of a direct offset. Based on this methodology impact areas are scored and then offset areas with the same or higher score must be secured. Ecological equivalence assessments will be undertaken as part of the implementation of the proposal.

Therefore, offset requirements have not been presented in terms of areas to be secured. It is important to note that offset requirements as presented in the following sections are not cumulative as some environmental values occur within the same area.

The QGEOP and EOP support the development of offset packages that meet the combined requirements of the Queensland Government offset policies and the Australian Government EOP. In delivering offsets for the project, offset values that occur within the same area will be collocated where possible. In considering this potential it is important to note that the PVMO and QBOP do not permit remnant vegetation as environmental offsets, while the EOP allows for the delivery of offsets consisting of remnant vegetation.

6.1.1 EPBC Act Environmental Offsets Policy

Due to anticipated impacts on MNES, including habitat for listed threatened fauna species and threatened ecological communities, it is expected that the EOP will be applied to the project. Under the EOP a suitable offset must:

- deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action
- be built around direct offsets but may include other compensatory measures
- be in proportion to the level of statutory protection that applies to the protected matter
- be of a size and scale proportionate to the impacts on the protected matter
- effectively account for and manage the risks of the offset not succeeding
- 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 state or territory offsets)
- be efficient, effective, timely, transparent, scientifically robust and reasonable
- have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Table 22 summaries the offset requirements of the project applicable under the EOP.

Table 22: Offset requirements of the project under the EOP

MNES	SPECIES/COMMUNITY	MINIMUM OFFSET AREA (HA)
Mine		
	Brigalow Scaly-foot <i>Paradelma orientalis</i>	2,274.35
	Yakka Skink <i>Egernia rugosa</i>	2,223.22
	Squatter Pigeon (sth. subsp.) <i>Geophaps scripta scripta</i>	3,590.28
	Ornamental Snake <i>Denisonia maculata</i>	33.73
	Black-throated Finch (sth. subsp.) <i>Peophila cincta cincta</i>	3,590.28
	Northern Quoll <i>Dasyurus hallucatus</i>	86.53
Rail		
	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	30.02
	Weeping Myall Woodlands	23.42
Threatened ecological communities	Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	1.94
	Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	21.36
Threatened fauna	Ornamental Snake <i>Denisonia maculata</i>	185.29
	Black-throated Finch <i>Poephila cincta cincta</i>	103.21
	Brigalow Scaly-foot <i>Paradelma orientalis</i>	609.33
	Northern Quoll <i>Dasyurus hallucatus</i>	291.41
	Striped-tailed Delma <i>Delma labialis</i>	402.13
	Yakka Skink <i>Egernia rugosa</i>	1,138.00
	Dunmall's Snake <i>Furina dunmali</i>	105.28
	Red Goshawk <i>Erythrorchis radiatus</i>	504.01
	Australian Painted Snipe <i>Rostratula australis</i>	7.86

6.1.2 Queensland Government Environmental Offset Policy

Offsets for the project will be delivered in accordance with the QGEOP which sets out seven principles that must be followed when delivering offsets. These principles are:

- Offsets will not replace or undermine existing environmental standards or regulatory requirements, or be used to allow development in areas otherwise prohibited through legislation or policy.
- Environmental impacts must first be avoided, then minimised, before considering the use of offsets for any remaining impact.
- Offsets must achieve an equivalent or better environmental outcome.
- Offsets must provide environmental values as similar as possible to those being lost.
- Offset provision should minimise the time-lag between the impact and delivery of the offset.
- Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values.
- Offsets must be legally secured for the duration of the offset requirement.

The types of environmental values to be offset are dictated by specific issue policies that operate within the QGEOP framework. The relevant specific issue policies and their applicability to the project are described below.

6.1.3 Policy for Vegetation Management Offsets, Version 3

Clearing native vegetation for a mining activity carried out on a mining lease is exempt under the VM Act and therefore exempt from offset requirements under the PVMO. However, clearing remnant vegetation outside of mining leases is subject to the provisions of the VM Act and as such the project's rail component is subject to PVMO offset requirements.

Table 23 summaries the offset requirements of the project's rail component under the PVMO.

Table 23: Offset requirements of the project's rail component under PVMO

ENVIRONMENTAL VALUE	DESCRIPTION	BVG	MINIMUM OFFSET AREA (HA)
Endangered regional ecosystems	11.3.1	25a	9.37
	11.4.8	25a	23.18
	11.4.9	25a	2.56
Of concern regional ecosystems	11.3.2	17a	18.26
	11.3.3	16c	23.21
	11.3.33	26a	2.25
	11.3.4	16c	24.08
	11.4.5	26a	4.81
	11.4.6	26a	0.53
	11.4.11	30b	2.29

ENVIRONMENTAL VALUE	DESCRIPTION	BVG	MINIMUM OFFSET AREA (HA)	
	11.5.10	21b		2.19
	11.9.10	25a		7.76
	11.11.13	25a		5.02
	11.11.16	25a		1.47
	11.12.10	9c		2.61
	11.12.14	28e		1.18
	11.12.15	27c		1.58
	11.12.16	24a		1.58
	11.12.18	29b		0.39
Threshold regional ecosystems	11.3.5	26a		9.16
	11.5.5	17b		1.04
Watercourse vegetation			Brigalow Belt Bioregion	Desert Uplands Bioregion
	Stream order 1		23.82	6.31
	Stream order 2		17.98	0.78
	Stream order 3		26.28	-
	Stream order 4		1.36	0.68
	Stream order 5		1.63	-
	Stream order 6	-	7.97	1.85
	Stream order 8	-	-	1.23
Connectivity	-	-		2,234.07

6.1.4 Queensland Biodiversity Offset Policy, Version 1

While QBOP does not apply to development that is a significant project declared under section 26(1)(a) of the SDPWO Act, the Coordinator-General may use discretionary powers to require compliance with the policy as part of an approval for a significant project. It is expected that QBOP will be required to be applied to the project's mine and rail impacts. Advice received from the Office of the Coordinator-General has indicated that offsets for the project are likely to be required to be delivered in the spirit of QBOP and not strictly in compliance with each criterion. Therefore, flexibility in the application of the policy is considered acceptable.

Table 24 summarises the potential offset requirements of the project under QBOP. Rail related impacts offset under the PVMO in **Section 6.1.3** are not offset under QBOP as QBOP does not apply to values that are offset by another Queensland Government offset policy.

Table 24: Applicable mine and rail impacts under QBOP

ENVIRONMENTAL VALUE	DESCRIPTION	MINIMUM OFFSET AREA (HA)
MINE		
Threshold regional ecosystems	11.5.5 (BVG 17b)	7.11
Threatened or conservation significant fauna NC Act	Koala <i>Phascolarctos cinereus</i>	5,458.59
	Brigalow Scaly-foot <i>Paradelma orientalis</i>	2,274.35
	Yakka Skink <i>Egernia rugosa</i>	2,223.22
	Squatter Pigeon <i>Geophaps scripta scripta</i>	3,590.28
	Ornamental Snake <i>Denisonia maculata</i>	33.73
	Black-throated Finch <i>Peophila cincta cincta</i>	3,590.28
	Little Pied Bat <i>Chalinolobus picatus</i>	2,235.75
	<i>Ctenotus capricorni</i>	4,011.62
	Square-tailed Kite <i>Lophoictinia isura</i>	5,543.01
	Black-chinned Honeyeater <i>Melithreptus gularis</i>	5,400.84
	Common Death Adder <i>Acanthophis antarcticus</i>	1,467.35
	Threatened flora NC Act	<i>Desmodium macrocarpum</i>
Essential habitat	<i>Desmodium macrocarpum</i>	487.44
Watercourse vegetation	Stream order 1	187.13
	Stream order 2	6.68
	Stream order 3	11.31
	Stream order 4	57.78
	Stream order 5	220.88
Connectivity	-	5,722.65
Wetlands	Wetland Protection Areas	126.63
	Significant wetlands	52.62
RAIL		
High value regrowth containing endangered regional ecosystems	BVG 25a	1.91
High value regrowth containing of concern regional ecosystems	BVG 26a, 25a, 27c, 24a, 28e, 29b	6.62
Threatened or conservation significant fauna NC Act	Ornamental Snake <i>Denisonia maculate</i>	185.29
	Black-throated Finch <i>Poephila cincta cincta</i>	103.21
	Brigalow Scaly-foot <i>Paradelma orientalis</i>	609.33
	Spotted-tailed Quoll <i>Dasyurus maculatus maculates</i>	291.41

ENVIRONMENTAL VALUE	DESCRIPTION	MINIMUM OFFSET AREA (HA)
	Striped-tailed Delma <i>Delma labialis</i>	402.13
	Yakka Skink <i>Egernia rugosa</i>	1,138.00
	Dunmall's Snake <i>Furina dunmali</i>	105.28
	Red Goshawk <i>Erythrotriorchis radiates</i>	504.01
	Australian Painted Snipe <i>Rostratula australis</i>	7.86
	Koala <i>Phascolarctos cinereus</i>	854.23
	Little Pied Bat <i>Chalinolobus picatus</i>	854.23
	Common Death Adder <i>Acanthophis antarcticus</i>	99.59
	Rough Frog <i>Cyclorana verrucosa</i>	47.85
	Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	7.86
	Freckled Duck <i>Stictonetta naevosa</i>	7.86
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	7.86
	Grey Goshawk <i>Accipiter novaehollandiae</i>	489.69
	Square-tailed Kite <i>Lophoictinia isura</i>	407.91
	GlossyBlack Cockatoo <i>Calyptorhynchus lathami</i>	76.87
	Black-chinned Honeyeater <i>Melithreptus gularis</i>	407.91
Threatened flora NC Act	TBC	TBC
Wetlands	Wetland Protection Areas	107.50

6.1.5 Bimblebox Nature Refuge

Waratah Coal has committed to voluntarily offset the BNR at a ratio of 1:2. Based on an impact area of 7,912 ha an offset area of approximately 15,824 ha is proposed to be secured as a Nature Refuge under the NC Act. In addition, Waratah Coal is committed to extinguishing any Waratah Coal mining tenements as part of the establishment of the Nature Refuge.

7 OFFSET DELIVERY

7.1 Approach to offset delivery

Based on a desktop assessment of available options, Ecofund has determined that the offset requirements of the project will be acquitted through direct offsets and, if required, indirect offsets.

7.1.1 Direct offsets

Direct offsets can involve the securing of land with similar environmental values, function and habitat as the impacted areas in order to deliver a measurable conservation gain for the impacted value. A conservation gain may be achieved by improving habitat quality, creating new habitat, reducing threats to the protected value or averting the loss of the protected value or its habitat. Directs that involve the securing of land must include ongoing land management for conservation purposes.

Direct offsets have been selected based on an assessment of the strategic footprint identified in the Galilee Basin Offset Strategy (DNRM *et al.* 2012) and on their ability to acquit the offset requirements under the applicable policies. All properties are located wholly or partially within strategic footprint areas as identified within the Galilee Basin Offset Strategy.

Offsets to compensate for the loss of the BNR were identified based on consultation with the Department of Environment and Heritage Protection's (DEHP's) Nature Refuge Branch and on a desktop assessment of the vegetation communities and environmental values present on each property.

Landholder engagement has not been undertaken to determine the interest of each property owner in supplying their property as an offset. In addition, all identified direct offsets require ground-truthing to determine whether the values identified through desktop assessment are present and to assess the ability of the direct offset to result in a measurable conservation gain.

7.1.2 Indirect offsets or compensatory measures

Under EOP compensatory measures are actions, such as funding for research or educational programs, which lead to benefits for the protected matter. Such programs must:

- endeavour to improve the viability of the impacted protected matter
- be targeted toward key research and/or educational activities as identified in the relevant Commonwealth approved recovery plan, threat abatement plan, conservation advice, ecological character description, management plan or listing document.
- be undertaken in a transparent, scientifically robust and timely manner.
- be undertaken by a suitably qualified individual or organisation in a manner approved by the department
- consider best practice research approaches.

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Under QBOP and PVMO, indirect offsets may form part of an offset package, in combination with a direct offset in situations where the offset area provided substantially achieves ecological equivalence with the area to be cleared, however, fails to meet the required ecological equivalence scores. The indirect offset must be:

- an activity that will result in, or improve the spatial capture of vegetation and wildlife information, including:
 - » habitat mapping/modelling for priority species
 - » development of RE BioCondition benchmarks
 - » finer scale RE mapping
 - » fauna surveys in identified strategic areas
 - » approved 'on-ground' and 'research and monitoring' actions derived from the Back on Track species prioritisation framework Action Plans.
 - » an action addressing a threatening process for a species or ecosystem (within the same bioregion) identified in a State or Commonwealth approved conservation or recovery plan.

Indirect offsets and/or compensatory measures will be proposed in the event that direct offsets are unable to solely fulfil the offset requirements for a particular value.

8 BIODIVERSITY OFFSET OPTIONS

8.1 Overview

Ecofund has selected seven priority properties that contain potential offset areas to acquit the offset requirements of the project under both Queensland and Australian Government offset policies. All identified properties are located wholly or partially within areas defined in the Galilee Basin Offset Strategy and within 150 km of the project's mine or rail component.

Based on a desktop assessment these properties have the ability to acquit the offset requirements of the project, however, further field investigations are required to confirm the suitability of the identified offset areas. All impacted values are represented on these properties based on spatial analysis except significant wetlands. This is likely to be due to data limitations and targeted field surveys will be undertaken to identify significant wetland areas on the ground. Ecofund has also identified a number of alternative properties, should offsets be unable to be secured on any of the priority properties due to either landholder disinterest or unsuitability as an offset.

8.2 Priority offset options

8.2.1 Property 1

Property 1 is located within Barcaldine Regional Council Local Government Area and the Desert Uplands Bioregion. The tenure of the property is leasehold and it is zoned as rural in the Local Government Planning Scheme. It is also surrounded by rural land and contains areas of Class C1 Good Quality Agricultural Land.

Property 1 is located within the Galilee Basin Offset Strategy strategic footprint and consists of of concern and least concern remnant vegetation and non-remnant areas. All non-remnant areas are classified as Category X on a Property Map of Assessable Vegetation (PMAV). Category X areas do not contain any assessable vegetation and can be cleared at any time. Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Least concern RE 10.5.5a (BVG 17b) - *Eucalyptus melanophloia* open-woodland.
- Least concern RE 10.9.2a (BVG 26a) - *Acacia cambagei* low open-woodland.
- Least concern RE 10.4.3a (BVG 25a) - *Acacia harpophylla* woodlands and low forests with *Eucalyptus cambageana* emergents or *Eucalyptus cambageana* grassy or shrubby woodlands.

The property is located upstream from Coongie Lakes, a Ramsar Wetland of International Importance (SEWPaC 2013) and a number of watercourses are present on the property with stream orders ranging from 1 to 3. Property 1 also contains mapped essential habitat for *Desmodium macrocarpum* and database searches reveal one record for squatter pigeon (southern subspecies) (DERM 2013). A number of MNES that are not being impacted by the project are likely to occur within or surrounding the property including listed threatened species and migratory species.

Property 1 is Waratah Coal's preferred property to compensate for the loss of the BNR. Property 1 contains similar vegetation and environmental values as BNR and based on discussions with the Nature Refuge Branch is suitable for gazettal as a protected area under the NC Act. The property is subject to coal, petroleum and gas exploration permits including coal exploration permits granted to Waratah Coal (DNRM 2013). As part of offset delivery Waratah Coal proposes to extinguish any of its mining tenements over the property to afford better protection to the offset.

In addition, Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment Property 1 also has the potential to acquit offset requirements of the project under the EOP, PVMO and QBOP (**Table 25**).

8.2.2 Property 2

Property 2 is located within the Brigalow Belt Bioregion and the Whitsunday Regional Council Local Government Area. The tenure of the property is leasehold. Property 2 is zoned as rural in the Local Government Planning Scheme and is also surrounded by rural land.

The property is located within the Galilee Basin Offset Strategy strategic footprint and consists of of concern and least concern remnant vegetation, of concern and least concern HVR and non-remnant areas. Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Least concern RE 11.3.32 (BVG 18a) - *Allocasuarina luehmannii* open woodland on alluvial plains.
- Least concern RE 11.12.9 (BVG 9b) - *Eucalyptus platyphylla* woodland on igneous rocks.
- Least concern RE 11.12.1 (BVG 13c) - *Eucalyptus crebra* woodland on igneous rocks.
- Of concern RE 11.12.15 (27c) - *Allocasuarina torulosa*, *Livistona drudei* woodland on igneous rocks.
- Of concern RE 11.12.16 (24a) - *Acacia* spp. low woodland on igneous rocks.

A number of watercourses are present on the property with stream orders ranging from 1 to 4. Database searches reveal one record for the black-chinned honeyeater (DERM 2013) and indicate that a number of threatened or conservation significant species being impacted by the project, or their habitat, is likely or known to occur within or surrounding the property including:

- Black throated finch
- Northern quoll
- Red goshawk
- Squatter pigeon (southern)
- Koala.

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes protected plants, migratory marine birds, migratory marine species and migratory terrestrial species (SEWPaC 2013). The property is subject to mineral exploration permits and coal exploration permit applications (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 2 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

8.2.3 Property 3

Property 3 straddles the Desert Uplands and Brigalow Belt Bioregion and is located within the Isaac Regional Council Local Government Area. The tenure of the property is leasehold. Property 3 is zoned as rural in the Local Government Planning Scheme and is surrounded by rural land and open space and recreational land to the east. It also contains areas of Class C1 Good Quality Agricultural Land.

The property is located within the Galilee Basin Offset Strategy strategic footprint and consists of endangered, of concern and least concern remnant vegetation, of concern HVR and non-remnant areas. Non-remnant areas of the property are classified as Category X on a PMAV. Category X areas do not contain any assessable vegetation and can be cleared at any time. Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Of concern RE 11.3.3 (BVG 16c) - *Eucalyptus coolabah* woodland on alluvial plains.
- Least concern RE 11.3.5 (BVG 26a) - *Acacia cambagei* woodland on alluvial plains.
- Least concern RE 10.5.5 (BVG 17b) - *Eucalyptus melanophloia* open woodland on sand plains.
- Least concern RE 10.3.28 (BVG 17b) - *Eucalyptus melanophloia* or *E. crebra* open woodland on sandy alluvial fans.

A number of watercourses are present on the property with stream orders ranging from 1 to 8. Database searches reveal one record for the black-necked stork, two records of the squatter pigeon (southern subspecies), eight records of the black-throated finch, one record of the koala, one record of the little pied bat, 16 records of the endangered northern hairy-nosed wombat and one record of the near threatened plant *Ctenotus capricorni* (DERM 2013). Database searches also indicate that the endangered Brigalow TEC may occur within the area. In addition a number of threatened or conservation significant species being impacted by the project, or their habitat, is likely or known to occur within or surrounding the property including:

- Dunmall's snake
- Ornamental snake
- Red goshawk
- Squatter pigeon (southern subspecies)
- Yakka skink
- Koala.

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes protected plants, migratory marine birds and migratory terrestrial species (SEWPaC 2013).

The property is subject to coal and mineral exploration permit applications and coal, petroleum and gas exploration permits. Part of the property is also subject to coal production permit applications (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 3 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

8.2.4 Property 4

Property 4 is located within the Brigalow Belt Bioregion and the Barcaldine Regional Council Local Government Area. The tenure of the property is leasehold. Property 4 is zoned as rural in the Local Government Planning Scheme and is surrounded by rural land. It also contains areas of Class C1 Good Quality Agricultural Land.

The property is located within the Galilee Basin Offset Strategy strategic footprint and consists of endangered, of concern and least concern remnant vegetation, of concern and least concern HVR and non-remnant areas. Non-remnant areas of the property are classified as Category X on a PMAV. Category X areas do not contain any assessable vegetation and can be cleared at any time. The property also contains areas classified as Category C on a PMAV. Regional ecosystem mapping indicates that some of the dominant remnant vegetation communities are:

- Least concern RE 11.10.3 (BVG 24a) – *Acacia catenulata* or *A. shirleyi* open forest on coarse-grained sedimentary rocks.
- Least concern RE 11.10.4 (BVG 12a) – *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp. woodland on coarse-grained sedimentary rocks.
- Least concern RE 11.10.7 (BVG 12a) – *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks.
- Least concern RE 11.10.11 (BVG 17a) – *Eucalyptus populnea*, *E. melanophloia* +/- *Callitris glaucophylla* woodland on coarse-grained sedimentary rocks.
- Least concern RE 11.10.12 (BVG 17a) – *Eucalyptus populnea* woodland on medium to coarse-grained sedimentary rocks.
- Endangered RE 11.4.8 (BVG 25a) – *Eucalyptus cambageana* woodland to open forest with *Acacia harpophylla* or *A. argyrodendron* on Cainozoic clay plains.
- Of concern RE 11.3.2 (BVG 17a) -. *Eucalyptus populnea* woodland on alluvial plains.
- Of concern RE 11.9.11 (BVG 25a) -. *Acacia harpophylla* shrubland on fine-grained sedimentary rocks.

Listed threatened ecological communities under the EPBC Act which may or are likely to occur within or surrounding the property include:

- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin
- Weeping Myall Woodlands.

The property is located upstream from Coongie Lakes, a Ramsar Wetland of International Importance (SEWPaC 2013) and a number of watercourses are present on the property with stream orders ranging from 1 to 6. Database searches reveal one record for the near threatened plant *Acacia spania* (DERM 2013) and that the vulnerable squatter pigeon (southern species) is likely to occur within or surrounding the property.

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes listed threatened species, protected plants, migratory marine birds and migratory terrestrial species (SEWPaC 2013). The property is subject to coal, petroleum and gas exploration permits (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 4 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

8.2.5 Property 5

Property 5 is a 23,600 ha cattle grazing property located within the Brigalow Belt Bioregion and the Isaac Regional Council Local Government Area. The tenure of the property is leasehold and it is mapped as containing areas of Good Quality Agricultural Land in the Local Government Planning Scheme.

The property is located within the Drummond Range Hub identified in the Galilee Basin Offset Strategy and consists of endangered, of concern and least concern remnant vegetation, endangered, of concern and least concern HVR and non-remnant areas (**Figure 7**). Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Least concern RE 11.10.1 (BVG 10a) - *Corymbia citriodora* open forest on coarse-grained sedimentary rocks.
- Least concern RE 11.10.12 (BVG 17a) - *Eucalyptus populnea* woodland on medium to coarse-grained sedimentary rocks.
- Of concern RE 11.3.2 (BVG 17a) -. *Eucalyptus populnea* woodland on alluvial plains.
- Least concern RE 11.3.25 (BVG 16a) - *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines.

Listed threatened ecological communities under the EPBC Act which are known or likely to occur within or surrounding the property include:

- Brigalow (*Acacia harpophylla* dominant and co-dominant)
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions
- Weeping Myall Woodlands.

The property contains mapped essential habitat for the little pied bat and a number of watercourses with stream orders ranging from 1 to 6 including Scott Creek, Gilbert Creek, Campbell Creek, Stephens Creek and Feez Creek. Database searches reveal one record for the square-tailed kite, five records of the squatter pigeon (southern subspecies), one record of the little pied bat, two records of the koala and 1 record of the endangered northern hairy-nosed (DERM 2013). In addition a number of threatened or conservation significant species being impacted by the project, or their habitat, is likely or known to occur within or surrounding the property including:

- Ornamental snake
- Squatter pigeon (southern subspecies)
- Northern quoll
- Red goshawk
- Koala.

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes protected plants, migratory marine birds and migratory terrestrial species (SEWPaC 2013). The property is subject to coal, petroleum and gas exploration permits (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 5 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

8.2.6 Property 6

Property 6 is located within the Brigalow Belt Bioregion and the Burdekin Shire Council Local Government Area. The tenure of the property is leasehold and it is zoned as rural land in the Local Government Planning Scheme. It is also surrounded by rural land.

The property is located within the Galilee Basin Offset Strategy strategic footprint and consists of of concern and least concern remnant vegetation, of concern HVR and non-remnant areas. Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Least concern RE 11.3.7 (BVG 9e) - *Corymbia* spp. woodland on alluvial plains.
- Least concern RE 11.3.9 (BVG 9e) - *Eucalyptus platyphylla*, *Corymbia* spp. woodland on alluvial plains.
- Least concern RE 11.3.31 (BVG 32a) -. *Ophiuros exaltatus*, *Dichanthium* spp. grassland on alluvial plains.
- Least concern RE 11.12.9 (BVG 9b) - *Eucalyptus platyphylla* woodland on igneous rocks.

The property contains a number of watercourses with stream orders ranging from 1 to 4. Database searches reveal one record for the vulnerable plant species *Eucalyptus raveretiana* (DERM 2013). In addition a number of threatened species being impacted by the project, or their habitat, is likely or known to occur within or surrounding the property including:

- Black-throated finch (southern)
- Australian painted snipe
- Squatter pigeon (southern subspecies)
- Yakka skink
- Red goshawk.

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes listed threatened species, protected plants, migratory marine birds and migratory marine, terrestrial and wetland species (SEWPaC 2013). The property is subject to mineral and coal exploration permit applications, mineral exploration permits and an infrastructure permit (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 5 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

8.2.7 Property 7

Property 7 is located predominantly within the Desert Uplands Bioregion and the Charters Towers Regional Council Local Government Area. The tenure of the property is leasehold. It is zoned as rural in the Local Government Planning Scheme and is entirely surrounded by rural land.

The property is located within the Galilee Basin Offset Strategy strategic footprint and consists of endangered, of concern and least concern remnant vegetation, least concern HVR and non-remnant areas. Non-remnant areas of the property are classified as Category X on a PMAV. Category X areas do not contain any assessable vegetation and can be cleared at any time. Regional ecosystem mapping indicates that the dominant remnant vegetation communities are:

- Least concern RE 10.5.1 (BVG 17c) - *Eucalyptus similis* and/or *Corymbia brachycarpa* and/or *Corymbia setosa* low open woodland to open woodland on sand plains
- Least concern RE 10.5.5 (BVG 17b) - *Eucalyptus melanophloia* open woodland on sand plains
- Least concern RE 10.3.3 (BVG 25a) - *Acacia harpophylla* and/or *Eucalyptus cambageana* low open woodland to open woodland on alluvial plains
- Least concern RE 10.3.28 (BVG 17b) - *Eucalyptus melanophloia* or *E. crebra* open woodland on sandy alluvial fans

Listed threatened ecological communities under the EPBC Act which are known to occur within or surrounding the property include Brigalow (*Acacia harpophylla* dominant and co-dominant).

The property contains a Great Barrier Reef Wetland and number of watercourses with stream orders ranging from 1 to 4. Database searches reveal one record for the near-threatened cotton pygmy goose, two records of the black-necked stork and one record of the squatter pigeon (southern species) (DERM 2013). In addition two threatened species being impacted by the project, or their habitat, is likely or known to occur within or surrounding the property including:

- Black-throated finch (southern)
- Squatter pigeon (southern subspecies).

Additional MNES likely or known to occur within or surrounding the property, but not being impacted by the project includes listed threatened species, protected plants, migratory marine birds and migratory terrestrial and wetland species (SEWPaC 2013). The property is subject to mineral and coal exploration permit applications and coal, petroleum and gas exploration permits (DNRM 2013).

Ecofund has undertaken a desktop assessment of the property to determine the potential offset availability to acquit the offset requirements of the project. Based on this assessment property 7 has the potential to acquit offset requirements under the EOP, PVMO and QBOP (**Table 25**).

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Table 25: Offset potential of the priority offset properties

ENVIRONMENTAL VALUE	CAUSE OF IMPACT	STATUS	IMPACT AREA (HA)	POTENTIAL OFFSET AVAILABILITY (HA)							TOTAL AVAILABLE AREA	POTENTIAL OFFSET MULTIPLIER ⁵
				Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7		
EOP												
Australian Painted Snipe	Rail	Vulnerable (EPBC Act)	7.86	141	62	201	425	558	385	1,282	3,053	388.43
Black-throated Finch (southern)	Mine, Rail	Endangered (EPBC Act)	3,693.49	24,402	1,553	5,109	12,419	19,083	3,930	56,362	122,859	33.26
Brigalow	Rail	Endangered (EPBC Act)	30.02	-	-	96	284	155	-	277	812	27.05
Brigalow Scaly-foot	Mine, Rail	Vulnerable (EPBC Act)	2,883.68	24,762	1,738	12,837	16,113	19,356	5,030	67,551	147,387	51.11
Coolibah - Black Box Woodlands	Rail	Endangered (EPBC Act)	1.94	-	-	1,544	-	-	-	0	1,544	795.99
Dunmall's Snake	Rail	Vulnerable (EPBC Act)	105.28	2,462	896	7,765	2,113	1,788	4,469	1,005	20,498	194.70
Natural Grasslands	Rail	Endangered (EPBC Act)	21.36	-	-	116	-	1,618	-	-	1,733	81.15
Northern Quoll	Mine, Rail	Endangered (EPBC Act)	377.94	-	62	-	14,909	14,708	-	133	29,812	78.88
Ornamental Snake	Mine, Rail	Vulnerable (EPBC Act)	219.02	5,631	1,727	7,729	12,667	19,315	5,030	8,481	60,580	276.59
Red Goshawk	Rail	Vulnerable (EPBC Act)	504.01	3,499	745	7,954	3,121	768	1,423	20,269	37,780	74.96
Squatter Pigeon (sth. subsp.)	Mine	Vulnerable (EPBC Act)	3,590.28	23,817	1,321	8,007	12,419	19,202	5,030	63,702	133,499	37.18
Striped-tailed Delma	Rail	Vulnerable (EPBC Act)	402.13	-	1,738	7,765	2,113	1,788	5,279	883	19,567	48.66
Weeping Myall Woodlands	Rail	Endangered (EPBC Act)	23.42	-	-	-	1,005	595	-	-	1,600	68.33
Yakka Skink	Mine, Rail	Vulnerable (EPBC Act)	3,361.22	24,762	1,707	13,155	18,854	19,473	5,030	67,551	150,533	44.79
PVMO												
11.3.5	Rail	Threshold RE	9.16	-	-	947	-	-	-	-	947	103.41

⁵ Is a guide only based on a desktop assessment.

ENVIRONMENTAL VALUE	CAUSE OF IMPACT	STATUS	IMPACT AREA (HA)	POTENTIAL OFFSET AVAILABILITY (HA)							TOTAL AVAILABLE AREA	POTENTIAL OFFSET MULTIPLIER ⁵
				Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7		
11.5.5	Rail	Threshold RE	1.04	-	-	-	34	-	-	-	34	32.29
16c	Rail	Of concern	47.29	-	-	203	-	-	11	-	213	4.51
17a	Rail	Of Concern	18.26	-	-	24	297	221	-	-	542	29.69
21b	Rail	Of concern	2.19	-	-	-	-	3	-	-	3	1.20
24a	Rail	Of concern	1.58	-	4	-	-	-	-	-	4	2.73
25a	Rail	Endangered	35.10	-	-	24	186	104	-	-	314	8.94
25a	Rail	Of concern	14.25	-	-	24	312	104	-	126	566	39.71
26a	Rail	Of concern	7.59	-	-	194	-	-	-	-	194	25.53
27c	Rail	Of concern	1.58	-	4	-	-	-	-	-	4	2.73
28e	Rail	Of concern	1.18	-	3	-	-	-	-	-	3	2.73
29b	Rail	Of concern	0.39	-	1	-	-	-	-	-	1	2.73
30b	Rail	Of concern	2.29	-	-	4	-	-	-	-	4	1.68
9c	Rail	Of concern	2.61	-	-	-	-	-	69	-	69	26.45
Connectivity	Rail	-	2,234.07	-	76	1,508	2,167	3,571	786	206	8,313	3.72
Stream order 1	Rail	-	30.13	200	-	1,995	-	3,571	786	-	6,551	355.09
Stream order 2	Rail	-	18.76	10	-	1,995	-	3,571	786	-	6,361	963.50
Stream order 3	Rail	-	26.28	-	-	1,508	-	3,571	786	-	5,864	223.15
Stream order 4	Rail	-	2.04	-	-	1,995	-	3,571	786	-	6,351	5,028.33
Stream order 5	Rail	-	1.63	-	-	1,508	-	3,571	-	-	5,078	3,115.55
Stream order 6	Rail	-	9.82	-	-	1,995	-	-	-	-	1,995	452.50
Stream order 8	Rail	-	1.23	-	-	487	-	-	-	-	487	396.04
QBOP												
11.5.5	Mine	Threshold RE	7.11	-	-	-	34	-	-	-	34	4.72

ENVIRONMENTAL VALUE	CAUSE OF IMPACT	STATUS	IMPACT AREA (HA)	POTENTIAL OFFSET AVAILABILITY (HA)							TOTAL AVAILABLE AREA	POTENTIAL OFFSET MULTIPLIER ⁵
				Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7		
Australian Painted Snipe	Rail	Vulnerable (NC Act)	7.86	-	-	-	68	60	105	148	382	48.60
Black-chinned Honeyeater	Mine, Rail	Near threatened (NC Act)	5,808.75	4,102	32	607	876	2,087	746	7,196	15,646	2.69
Black-necked Stork	Rail	Near threatened (NC Act)	7.86	-	-	-	68	60	105	148	382	48.60
Black-throated Finch (southern)	Mine, Rail	Vulnerable (NC Act)	3,693.49	4,413	66	628	1,734	3,327	575	4,771	15,514	4.20
Brigalow Scaly-foot	Mine, Rail	Vulnerable (NC Act)	2,883.68	4,426	76	1,578	1,938	3,493	677	7,361	19,547	6.78
Common Death Adder	Mine, Rail	Near threatened (NC Act)	1,566.94	4,426	-	292	663	1,841	-	7,154	14,376	9.17
Connectivity	Mine	-	5,722.65	4,440	-	487	-	-	-	7,154	12,082	2.11
Cotton Pygmy Goose	Rail	Near threatened (NC Act)	7.86	-	-	-	68	60	105	148	382	48.60
Ctenotus capricorni	Mine	Near Threatened (NC Act)	4,011.62	4,426	-	292	-	-	-	7,154	11,872	2.96
Desmodium macrocarpum	Mine	Essential Habitat and threatened plant	622.44	3,069	-	292	-	-	-	4,310	7,670	12.32
Dunmall's Snake	Rail	Vulnerable (NC Act)	105.28	-	-	-	68	60	105	1	234	2.23
Freckled Duck	Rail	Near threatened (NC Act)	7.86	-	-	-	68	60	105	-	234	29.76
Glossy-black Cockatoo	Rail	Vulnerable (NC Act)	76.87	-	15	-	75	60	105	-	255	3.32
Grey Goshawk	Rail	Near threatened (NC Act)	489.69	-	26	-	116	165	218	-	525	1.07

ENVIRONMENTAL VALUE	CAUSE OF IMPACT	STATUS	IMPACT AREA (HA)	POTENTIAL OFFSET AVAILABILITY (HA)							TOTAL AVAILABLE AREA	POTENTIAL OFFSET MULTIPLIER ⁵
				Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7		
HVR 21b	Rail	Of Concern	0.02	-	-	-	-	3	-	-	3	131.12
HVR 24a	Rail	Of Concern	0.67	-	4	-	-	-	-	-	4	6.45
HVR 25a	Rail	Endangered	1.91	-	-	24	186	104	-	-	314	164.29
HVR 25a	Rail	Of Concern	1.15	-	-	24	312	104	-	126	566	494.12
HVR 26a	Rail	Of Concern	3.46	-	-	194	-	-	-	-	194	56.05
HVR 27c	Rail	Of Concern	0.67	-	4	-	-	-	-	-	4	6.45
HVR 28e	Rail	Of Concern	0.50	-	3	-	-	-	-	-	3	6.45
HVR 29b	Rail	Of Concern	0.17	-	1	-	-	-	-	-	1	6.45
Koala	Mine, rail	Special least concern (NC Act)	6,312.82	990	56	603	1,501	3,268	641	3,729	10,788	1.71
Little Pied Bat	Mine, rail	Near threatened (NC Act)	3,089.98	4,426	49	607	851	2,085	677	7,196	15,891	5.14
Ornamental Snake	Mine, rail	Vulnerable (NC Act)	219.02	610	76	1,286	1,797	3,432	677	1,085	8,964	40.93
Red Goshawk	Mine, rail	Vulnerable (NC Act)	504.01	1,041	26	7,172	116	165	218	4,674	13,412	26.61
Rough Frog	Rail	Near threatened (NC Act)	47.85	-	-	198	129	43	-	-	370	7.72
Significant wetlands	Mine	-	52.62	-	-	-	-	-	-	-	0	0.00
Spotted-tailed Quoll	Rail	Endangered (NC Act)	291.41	-	4	-	333	74	-	5	417	1.43
Square-tailed Kite	Mine, rail	Near Threatened (NC Act)	5,950.92	4,088	32	607	844	2,085	677	7,196	15,529	2.61
Squatter Pigeon (sth. subsp.)	Mine	Vulnerable (NC Act)	3,590.28	4,088	49	631	1,615	3,371	677	7,328	17,758	4.95
Stream order 1	Mine	-	187.13	200	-	487	-	-	-	-	687	3.67

ENVIRONMENTAL VALUE	CAUSE OF IMPACT	STATUS	IMPACT AREA (HA)	POTENTIAL OFFSET AVAILABILITY (HA)							TOTAL AVAILABLE AREA	POTENTIAL OFFSET MULTIPLIER ⁵
				Property 1	Property 2	Property 3	Property 4	Property 5	Property 6	Property 7		
Stream order 2	Mine	-	6.68	10	-	487	-	-	-	-	497	74.42
Stream order 3	Mine	-	11.31	15	-	487	-	-	-	-	502	44.40
Stream order 4	Mine	-	57.78	-	-	487	-	-	-	-	487	8.43
Stream order 5	Mine	-	220.88	-	-	487	-	-	-	-	487	2.21
Striped-tailed Delma	Rail	Vulnerable (NC Act)	402.13	-	76	1,286	406	382	746	-	2,897	7.20
Wetland protection areas	Mine, rail	-	234.13	-	-	-	-	-	-	243	243	1.04
Yakka Skink	Mine, Rail	Vulnerable (NC Act)	3,361.22	4,426	75	1,772	2,056	3,432	677	7,361	19,799	5.89
Other environmental values												
Nature Refuge (Bimblebox)	Mine	-	7,912.00	26,418	-	-	-	-	-	-	26,418	3.34

8.3 Ecological Equivalence Assessments

BioCondition assessments have been undertaken at 43 sites across the project's mine footprint. The results of these assessments are available in the Spring Creek (Galilee Coal Project) Supplemental Flora and Vegetation Assessments (O2 Ecology 2012) and the Flora and Vegetation Report (Friend 2012). No benchmarks are currently available for the assessed regional ecosystems. The results from these BioCondition assessments will be used to inform the ecological equivalence assessments of the impact sites. Ecological equivalence assessments of the both the impact and offset sites will be undertaken in accordance with the Queensland Government's Ecological Equivalence Methodology Guideline Version 3.

8.4 Alternative offset properties

While the properties identified in **Section 8.2** are Waratah Coal's priority offset options, Ecofund has identified a number of alternative offset properties that can be used to substitute the priority properties in the case that an offset is unable to be secured. All alternative properties have been selected from within the Galilee Basin Offset Strategy footprint. In addition, five properties have been identified in consultation with DEHP's Nature Refuge Branch as alternative options to compensate for the loss of BNR. For confidentiality reasons the details of alternative offset properties, including lot on plan numbers and maps, have been removed from this proposal.

9 OFFSET IMPLEMENTATION

9.1 Staged approach

Due to the uncertainty of how subsidence associated with underground mining activities will impact on MNES and MSES, Waratah Coal has adopted a staged approach to offset delivery. This approach will still involve upfront delivery of offsets for the project's rail component, open cut pits, coal preparation plants and underground mining activities proposed to occur in years 0 to 5. However, to allow for information gained from monitoring of the impacts of subsidence between years 0 and 5 to inform the offset requirements for impacts arising from underground mining activities that may occur between years 5 and 30, offsets for underground mining activities will be delivered in five yearly stages that correspond with the underground mining development sequence (**Table 26**).

A conservative assessment has been applied to estimating the impacts of underground mining activities for years 0 to 5. These impacts, as outlined in **Section 4**, assume that all vegetation above underground mining activities will be lost as a result of subsidence and offsets have been proposed accordingly. Based on a staged approach the actual impacts on MNES and MSES during years 0 to 5 will be monitored and assessed in accordance with the Subsidence Monitoring and Management Plan outlined in the Long-wall Mining Subsidence Report. Monitoring methods have been developed in accordance with the Watercourse Subsidence Guidelines for the Central Queensland Mining Industry (Version 7) and the BioCondition monitoring framework to allow for the quantitative assessment of any direct and indirect impacts to vegetation communities.

The results of these assessments will be used to recalculate the impacts of underground mining activities for years 0 to 5 and identify any surplus offsets that may have been delivered during Stage 1 offset delivery. These results will also be used to inform impact assessment for the subsequent stages of underground mining activities and an Offset Proposal for the next stage will be prepared accordingly. Based on this approach Waratah Coal will continue to deliver offsets for the remaining impacts arising from the underground mining activities in five yearly stages to year 30 (Stages 2 to 6), if required.

Table 26: Staged offset delivery

STAGE	YEARS	ACTIVITIES
Pre-delivery	NA	<ul style="list-style-type: none"> • Desktop assessment and modelling of Stage 1 subsidence impacts
1	0 - 5	<ul style="list-style-type: none"> • Rail easement and associated infrastructure offset • Open cut mine pits and coal preparation plants offset • Stage 1 subsidence impacts offset
2	6 - 10	<ul style="list-style-type: none"> • Stage 1 subsidence impacts verified • Stage 2 subsidence impacts determined, an Offset Proposal prepared and offsets delivered accordingly
3	11 - 15	<ul style="list-style-type: none"> • Stage 2 subsidence impacts verified • Stage 3 subsidence impacts determined, an Offset Proposal prepared and offsets delivered accordingly
4	15 - 20	<ul style="list-style-type: none"> • Stage 3 subsidence impacts verified • Stage 4 subsidence impacts determined, an Offset Proposal prepared and offsets delivered accordingly
5	21 - 25	<ul style="list-style-type: none"> • Stage 4 subsidence impacts verified • Stage 5 subsidence impacts determined, an Offset Proposal prepared and offsets delivered accordingly
6	26 - 30	<ul style="list-style-type: none"> • Stage 5 subsidence impacts verified • Stage 6 subsidence impacts determined, an Offset Proposal prepared and offsets delivered accordingly

9.2 Implementation components

Implementation of the Biodiversity Offset Proposal will involve the following components.

9.2.1 Regulator endorsement and project approval

Regulator endorsement includes both preliminary endorsement of the overall approach as outlined in the proposal and official endorsement of each final offset option including approval of OAMPs and legally binding protection mechanisms. In addition, the progression of offset delivery is dependent on project approval from both the Queensland and Australian Government.

9.2.2 Finalisation of ecological equivalence of impact areas

Ecological equivalence assessments of the impact areas will be finalised in accordance with the Ecological Equivalence Methodology Guideline Version 3.

9.2.3 Landholder engagement and negotiation

The Queensland Government has requested that Waratah Coal refrain from contacting landholders identified in the Galilee Basin Offset Strategy as a government led community consultation process is in progress. Waratah Coal awaits further details of the results of the consultation process and the next steps to engaging with landholders directly. Landholder engagement and negotiation is likely to continue throughout the entire offset implementation period. Replacement properties will be utilised should landholder engagement be unsuccessful.

9.2.4 Field assessments of offset areas

Field assessments of each offset option will be undertaken, including ecological equivalence assessments and flora and fauna surveys where appropriate. The aim of the field assessment is to verify that the values identified through desktop assessments are present on each offset option and confirm the suitability of the property as an offset. Assessments will also inform the size of the offset area and the management requirements of each offset property. Replacement properties will be utilised should the results of field assessments indicate that the identified environmental values are not present on the ground.

9.2.5 Offsets assessment guide calculations

Waratah Coal will apply the Australian Governments offsets assessment guide to assess the suitability of offsets for threatened species and ecological communities. The results of field assessments will be required to inform the calculations. Preliminary analysis of the proposed offsets for MNES has been undertaken using the guide and once completed the results will be provided to the Australian Government during the assessment process.

9.2.6 Property reports

If required, individual property reports will be prepared to:

- outline the results of field assessments and landholder engagement
- further define the MNES and MSES values that will be offset on the property
- describe the compliance of the proposed offset with the relevant offset policies, including results of ecological equivalence and offsets assessment guide calculations.

9.2.7 Offset area management plans

OAMPs will be developed for each offset area. These plans will be based on field assessments and will outline the specific management objectives and outcomes for each property. Each OAMP will be developed in consultation with regulators, Waratah Coal and the relevant landholders and will then be submitted to the regulators for review and endorsement. OAMPs will include:

- a map of the offset area, including GPS points
- the type and location of values to be offset
- the ecological equivalence assessment of the offset area, if appropriate
- the offset area management objectives and outcomes
- activities that will be undertaken to achieve the management objectives and outcomes
- an analysis of the risks to achieving the management objectives and outcomes
- a monitoring and reporting program
- estimated time until the offset management objectives and outcomes will be achieved
- identification of all registered interests including mortgages, leases, subleases, covenants, profit-a-prendre, easements and building statements, that have been registered on title under the *Land Act 1994* and *Land Title Act 1994*.

9.2.8 Progress reporting

Waratah Coal proposes to report on progress securing offsets annually in the first five years and then every five years to correspond with the staged approach to offset delivery, if required. The reporting framework will:

- report progress of offset requirements as specified in the Biodiversity Offset Proposal
- demonstrate whether or not the offset requirements are being met and why
- identify any changes to offset delivery during the reporting period
- be available for auditing by a third party to identify where investigation and/or compliance action is required by the department.

In addition, Waratah Coal will develop an offset accounting framework to monitor the progress of offset delivery and record acquitted values.

9.2.9 Legally binding mechanisms

All offsets must be secured by a legally binding mechanism. The appropriate mechanism for each offset will be determined through negotiation with regulators, Waratah Coal and the landholder. Legally binding mechanisms may include the following, as recognised by the NC Act:

- Conservation Park - under the NC Act a conservation park is to be managed to:
 - » conserve and present the area's cultural and natural resources and their values
 - » provide for the permanent conservation of the area's natural condition to the greatest possible extent
 - » ensure that any commercial use of the area's natural resources, including fishing and grazing, is ecologically sustainable.
- Nature refuge - A nature refuge is a voluntary agreement between a landholder and the Queensland Government that acknowledges a commitment to manage and preserve land with significant conservation values while allowing compatible and sustainable land uses to continue. Under the NC Act a nature refuge is to be managed to:
 - » conserve the area's significant cultural and natural resources
 - » provide for the controlled use of the area's cultural and natural resources
 - » provide for the interests of landholders to be taken into account.
- Resource reserve - under the NC Act a resources reserve is to be managed to:
 - » recognise and, if appropriate, protect the area's cultural and natural resources
 - » provide for the controlled use of the area's cultural natural resources
 - » ensure that the area is maintained predominantly in its natural condition
 - » eliminate the felling of timber for a commercial purpose.
- National park - under the NC Act a national park is to be managed to:
 - » provide, to the greatest possible extent, for the permanent preservation of the area's natural condition and the protection of the area's cultural resources and values - the cardinal principle for the management of national parks
 - » present the area's cultural and natural resources and their values
 - » ensure that the only use of the area is nature-based and ecologically sustainable.

Legally binding mechanisms may include conservation agreements under the EPBC Act. This involves an agreement between the Australian Government Environment Minister and another person for the protection and conservation of biodiversity in an area of land or sea. A conservation agreement may provide for:

- activities that promote the protection and conservation of the following:
 - » biodiversity
 - » the world heritage values of declared World Heritage properties
 - » the National Heritage values of National Heritage places
 - » the Commonwealth Heritage values of Commonwealth Heritage places

- » the ecological character of a declared Ramsar wetland
- » the environment, in respect of the impact of a nuclear action
- » the environment in a Commonwealth marine area
- » the environment on Commonwealth land.
- financial, technical or other assistance from the Commonwealth
- monitoring compliance with the agreement.

Offsets may also be protected through a Voluntary Declaration as recognised under the VM Act. A voluntary declaration is registered on the property title. For the area to be considered for declaration as an area of high nature conservation value the area must be one or more of the following:

- a wildlife refugium—an area where a species or a group of species has retreated due to a threatening process (e.g. climatic change)
- a centre of endemism—an area containing concentrations of species that are largely restricted to the area
- an area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity
- an area that makes a significant contribution to the conservation of biodiversity
- an area that contributes to the conservation value of a wetland, lake or spring
- another area that contributes to the conservation of the environment.

9.2.10 Implementation of the Offset Area Management Plans

Once approved, the OAMPs will be implemented. Implementation includes ongoing management, monitoring and reporting until the objectives of the OAMP have been achieved.

9.3 Implementation timeframes

It is anticipated that stage 1 offset implementation will be delivered in accordance with the tasks and timeframes set out in **Table 27**. However, these tasks and timeframes are subject to change due to a number of variables, including but not limited to, regulatory approval, regulatory requirements, landholder negotiation, climatic conditions, field access, stakeholder inactivity and other unexpected delays.

Table 27: Stage 1 offset implementation - timeframes

TASKS	TIMEFRAME
Submission of the Biodiversity Offset Proposal	March 2013
Co-ordinator Generals Report	Mid 2013
Landholder engagement and negotiation	March 2013 – ongoing
Field assessments and ecological equivalence	March 2013 – ongoing
Preparation of OAMPs	November 2013 – February 2014
Regulatory approval of OAMPs	March 2014
Securing legally binding mechanisms	March – April 2014
Implementation of OAMPs	April 2014 – ongoing

10 CONCLUSION

Waratah Coal is committed to delivering a comprehensive offset program to compensate for the unavoidable impacts of the project on the environment. This proposal demonstrates that it is possible to deliver compliant offsets in accordance with the:

- *Environment Protection and Biodiversity Conservation Act 1999*
Environmental Offsets Policy, 2012
- Queensland Government Environmental Offsets Policy, 2008
- Policy for Vegetation Management Offsets Version 3, 2011
- Queensland Biodiversity Offset Policy Version 1, 2011

Ecofund has determined that the offset requirements of the project will be acquitted through the delivery of direct land based offsets and will be supplemented with indirect offsets or compensatory measures if required.

Ecofund has selected seven priority properties that contain potential offset areas to acquit the offset requirements of the project under both Queensland and Australian Government offset policies. All identified properties are located wholly or partially within areas defined in the Galilee Basin Offset Strategy and within 150 km of the project. The proposal also identifies a priority property, Property 1, to fulfil Waratah Coal's voluntary commitment to compensate for the loss of the BNR.

The implementation of the proposal has the potential to result in the protection and enhancement of over 50,000 ha of native vegetation containing significant biodiversity values. The proposed options are located within identified strategic biodiversity corridors and complement Queensland's existing protected area estate. The proposal highlights the capacity for Ecofund, Waratah Coal and the Queensland and Australian Governments to work together to deliver significant environmental outcomes and achieve higher level objectives such as the Australian Government's goal of increasing the size of the National Reserve System to 125 million ha by 2013.

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Waratah Coal Pty Ltd
Biodiversity Offset Proposal
March 2013

APPENDIX A - THREATENED FAUNA OFFSET ASSESSMENT RAIL



Threatened Fauna SEIS Offset Assessment

Rail Site Galilee Coal Project (Northern Export Facility)

Prepared for: **Natasha McIntosh, Waratah Coal**
Prepared by: **Lindsay Agnew, Austecology**
Report Status: **Final November 2012**

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1. Introduction

1.1. Background and Purpose

Waratah Coal proposes to establish a new rail line to transport coal from its proposed coal mining operations north-west of Alpha, Central Queensland, to future or existing coal terminal facilities on land within the Port of Abbot Point and the Abbot Point State Development Area (APSDA) (see Figure 1-1).

On 28 October 2008, the project was gazetted as a “significant project” under the *State Development and Public Works Organisation Act 1971* (SDPWO Act), and requiring an environmental impact statement (EIS). Terms of reference for the EIS were released in August 2009, and the subsequent EIS was submitted to the Coordinator General, Department of State Development, Infrastructure and Planning (DSDIP) in September 2011. As part of the EIS review process, both the Commonwealth¹ and State² Governments provided comments on the draft EIS, and have requested that additional information be provided.

In regard to vertebrate fauna issues associated with the proposed rail line, the Supplementary EIS (SEIS) has provided the following reports:

- SEIS Position Paper - Vertebrate Fauna Survey Strategy; and
- SEIS Matter of National Environmental Significance Assessment.

The purpose of this report is to describe potential offset requirements as a result of the development of the proposed rail line, and the methodology employed to determine potential offset requirements in regard to threatened fauna species.

1.2. Offset Requirements

A Biodiversity Offset Strategy (the strategy) to address the offset requirements of the Project is being prepared³. The strategy aims to compensate for the unavoidable, non-mitigated loss of vegetation and biodiversity values as a result of the Project. The offset policies addressed in the strategy are the *Queensland Biodiversity Offset Policy Version 1* (QBOP) and the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (EOP).

The QBOP establishes the requirements for providing offsets to impacts to state significant biodiversity values (SSBV). Under the QBOP any actions which impact on a SSBV requires an offset. The list of SSBVs cited in the QBOP includes:

- Endangered, Of Concern, Threshold and Critically Limited Regional Ecosystems (REs);
- High Value Regrowth containing Of concern or Endangered REs;
- Essential habitat and Essential regrowth habitat;
- Wetlands, Significant Wetlands and Wetland Protection Areas;
- Watercourse vegetation;
- Vegetation required for Connectivity; and
- Protected Plants and Animals.

¹ SEWPaC correspondence to Waratah Coal (dated 1 April 2011) and to the Queensland Coordinator general (dated 26 January 2012).

² DERM's submission on the extent to which the EIS was successful in addressing the Terms of Reference (TOR) – dated December 2011.

³ See SEIS Biodiversity Offsets for the Galilee Coal Project Position paper contained in Volume 2 - Appendices of this SEIS.

The EOP establishes the framework under which offsets can operate in relation to approvals granted under the EPBCA, and the offset requirements for unavoidable impacts to MNES listed under the EPBCA. Under the EOP, values requiring offsets include:

- World heritage properties;
- Wetlands of international importance (Ramsar wetlands);
- Listed threatened species;
- Listed ecological communities;
- Listed migratory species protected under international agreements;
- The Commonwealth marine environment;
- National heritage places; and
- The Great Barrier Reef Marine Park.

A variety of biodiversity values have been assessed for the strategy for the Project. These include:

- Remnant regional ecosystems, high value regrowth containing regional ecosystems, threshold regional ecosystems, critically limited regional ecosystems;
- Essential habitat and essential regrowth habitat;
- Wetlands, watercourses, and connectivity, and
- Threatened fauna and flora species.

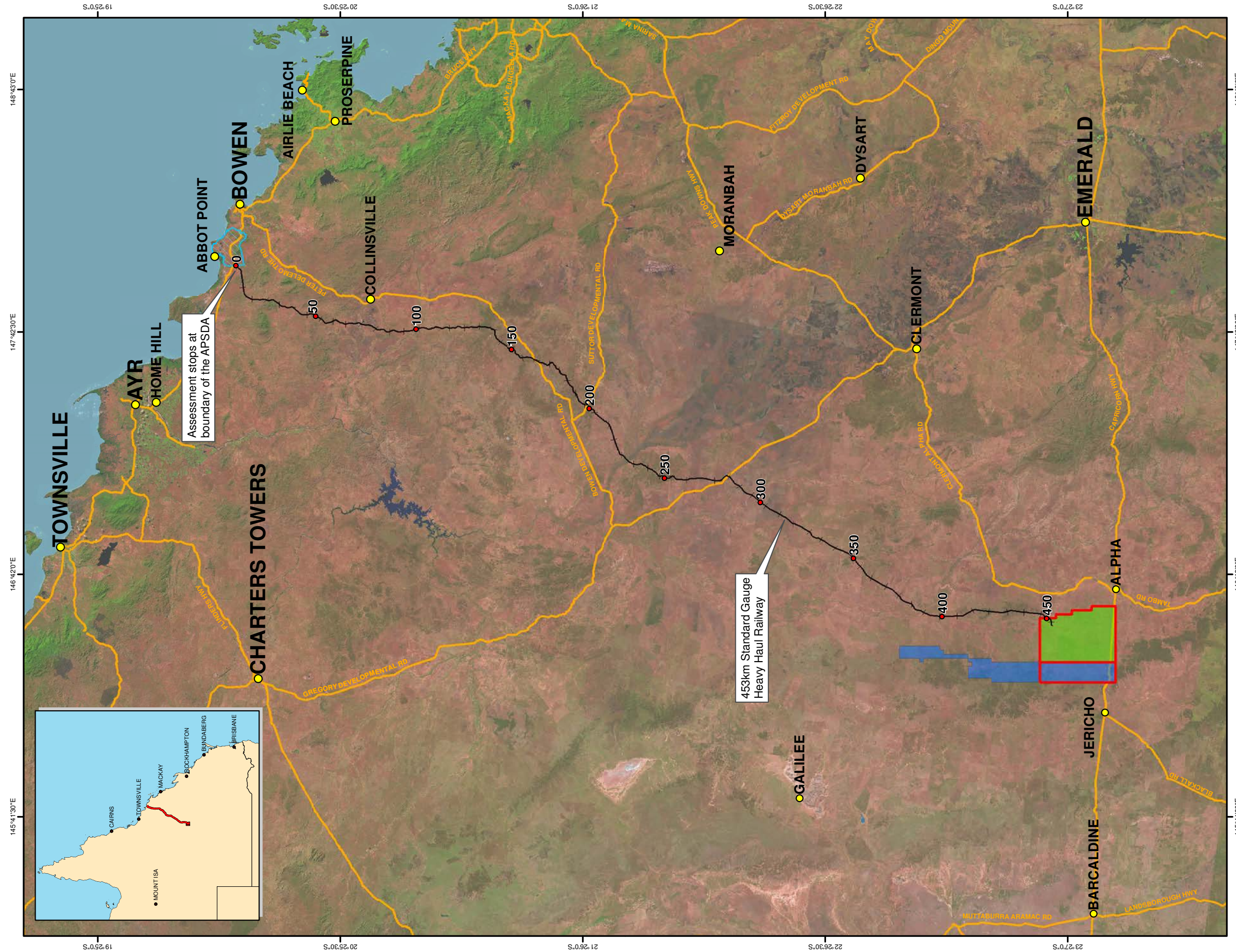
1.3. Terminology and Abbreviations

Within this report, fauna refers to all vertebrate fauna. Nomenclature follows Van Dyck and Strahan (2008), Churchill (2008), Christidis and Boles (2008), and Wilson (2009).

The conservation status of a species is described in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (i.e. Endangered or Vulnerable) and/or the Queensland *Nature Conservation Act 1992* and its regulations and amendments (i.e. Endangered, Vulnerable, Regionally Vulnerable, or Near Threatened). Threatened is a common term used to collectively describe Endangered and Vulnerable species.

Abbreviations used in this report include the following.

DERM	Queensland Department of Environment and Resource Management
DEWHA	Commonwealth Department of Environment, Water, Heritage and the Arts
EHP	Queensland Department of Environment and Heritage Protection
EPA	Queensland Department of Environmental Protection Agency
EPBCA	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
MNES	Matter of National Environmental Significance (as defined under the EPBCA)
NCA	Queensland Nature Conservation Act 1992
RE	Regional Ecosystem (as described under the Vegetation Management Act 1999)
REDD	Regional Ecosystem Description Database
SEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
VMA	Vegetation Management Act 1999
sp.	Species (singular)
spp.	Species (plural)



GALILEE COAL PROJECT
(Northern Export Facility)

Waratah Coal
THE NEW ENERGY IN COAL

Merembye House, Level 7, 380 Queen Street, Brisbane Qst 4000, Australia

FIGURE 1: PROJECT REGIONAL CONTEXT

Source: Landsat Image; Geoscience Australia 2005
Proposed Rail: Waratah Coal Pty Ltd 2012
Abbot Point State Development Area: Mpsla 2009

Disclaimer: This data is provided for informational purposes only. Waratah Coal Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or usability) and accepts no liability for any loss or damage (including consequential damage) resulting from use of the data. Data must not be used for direct marketing or be used in breach of privacy laws.

File: FORWARD26-SEI0000a-STUDYAREA12005

Arterial Road
Abbot Point State Development Area
50km Marker Point
Proposed Rail Alignment (03.05.2012)
Exploration Permit Coal (EPC) 1040
Exploration Permit Coal (EPC) 1079

0 20 40 60 80
Kilometres
A3 Scale 1:1,500,000
Coordinate System: GCS GDA 1994

2. Methodology

The process implemented to calculate the offset requirements associated with the Project relied upon the development of modeling to determine habitat values for the suite of threatened fauna species which are known to occur, or may occur on the study site. The following provides a description of the process to achieve species offset outputs.

2.1. Determining Likelihood of Occurrence

The initial stage of this process involved interrogation of public access databases and review of existing survey reports and ecological studies, i.e.:

- Datasets included:
 - DERM⁴ - WildNet Wildlife Online. Extracts based on a 25km buffer around the center line of the proposed rail;
 - SEWPaC – on-line protected matters search tool⁵. Extracts based on a 10km buffer around the center line of the proposed rail; and
 - Birdlife Australia Atlas Birdata⁶, GBIF⁷ Atlas of Living Australia⁸, and Eremaea Birds on-line atlas.
- Survey reports, including: Kutt & Skull 1995; Kutt & Kemp 1998; Kutt 1999; AARC 2004; WBM 2004; GHD 2009a and b; Lewis Consulting Services 2009; Parsons Brinkerhoff 2009; GHD 2010a and b; AARC 2010; Unidel 2011a and b; and Austecology 2012.
- VMA Essential Habitat mapping (Version 3.1; DERM 2012a);
- Bioregional assessment reports, including: Morgan *et al.* 2002; DERM 2012b;
- Recovery plans, including: Richardson 2006; BTFRP 2007; Hill & Ward 2010; and
- Modeled distributions, e.g.: Woinarski *et al.* 2008; DEWHA 2009a, and SEWPaC 2011 and 2012.

The initial broad list of threatened species (40 species) derived from the review of the above, was then assessed to determine their likelihood of occurrence relevant to the study site and surrounding area (see Attachment A). This assessment was undertaken in light of the following:

- VMA Essential Habitat Factors derived from extracts of the VMA Essential Habitat factors database (Version 3.1)⁹;
- Habitat descriptors from key threatened species documents, including recovery plans, policy statements, and species profiles, including: QPWS 2001; BTFRP 2007; Agnew 2007; DEWHA 2009b; Hill & Ward 2010; BBRW 2010; SEWPaC 2012 a-d);
- Habitat descriptions within the scientific literature which were regarded as geographically relevant to the study site and surrounding area (e.g. Ellis *et al.* 1995; Kutt 1999; Ellis *et al.* 2002); and
- VMA RE and Remnant Vegetation mapping (Version 6.1) and Regrowth Vegetation mapping (Version 2.1).

⁴ **Note:** the former Department of Environment and Resource Management is currently the Department of Environment and Heritage Protection. All certified mapping currently being produced is still attributed to DERM, hence the references to DERM throughout this report.

⁵ This database is partially predictive, and may not provide verified observations or records.

⁶ A national on-line database developed from the 1st and 2nd atlas projects and subsequent, on-going data collection.

⁷ The Global Biodiversity Information Facility was established by governments in 2001 to encourage free and open access to biodiversity data, via the Internet. The Atlas of Living Australia is an Australian Government initiative.

⁸ A national database on all the known flora and fauna species in Australia aggregated from a wide range of data providers including museums, herbaria, community groups, government departments, individuals and universities.

⁹ The habitat factors represent environmental variables for species records released and regulated as version 3.1 on 16/09/2011 under the *Vegetation Management Act* (1999).

As a result of this assessment, 22 threatened species (EPBCA and NCA) were selected for further assessment in regard to their likelihood of occurrence relevant to the study site and surrounding area, i.e.: those species either known to occur within the site, or likely to occur, or where occurrence is possible.

The assessment of the likelihood of occurrence was based on the assignment of one of the following categories:

- **Known** – where the species has been recorded on the site.
- **Likely** – where there is a medium to high probability of occurrence on the site.
- **Possible** – where potentially suitable habitat may occur on the site, though there are no records within the wider area and/or where insufficient information to categorise the species as likely to occur, or unlikely to occur. This category represents a highly conservative view of potential occurrence.
- **Other** – where there is a negligible probability of occurrence on the site or there is no suitable habitat present.

Attachment A provides the full list of the species assessed and the assigned likelihood of site occurrence.

2.2. Habitat Modeling

2.2.1. Rail Clearing Footprint

Within the easement all existing vegetation will need to be cleared to facilitate construction and operation of the rail. Waratah Coal has commissioned a concept design of the alignment of the 453km of rail corridor, i.e. from the boundary of the APSDA to the beginning of the rail loop at the mine site (see Railway Concept Design Report in Appendices - Volume 2 of this SEIS). This engineering provides the vertical alignment of the rail, which in turn provides the width required for the rail easement. At present, 421km of the rail vertical alignment has been engineered (with the balance 32km awaiting the completion of the Digital Terrain Model (DTM)), which will be completed as soon as possible.

In relatively flat terrain the rail will be 40m wide and in areas where cross-slope cuttings are required the width of the easement will be wider - up to a maximum width of 184m (however there are only two areas exceeding 150m). The easement includes both the rail and a service road.

The final railway easement will be an average width of 49.5m (average width calculated by dividing the total area of the rail footprint (2215 ha) by the length of the rail (453 km). In the 32km of the corridor which have not yet been engineered, a footprint area of 40m was assumed based upon the relatively flat topography.

2.2.2. Model Assumptions, Limitations and Interpretation

For all of the threatened fauna species considered here, the modelling of potential habitat has been underpinned by a suite of assumptions. A key working limitation to modeling potential species habitat is the paucity of observation point records for the region, though also issues of currency and spatial precision for the limited set of available records. As a result, it is not possible to include a valid statistical component in the development of these models.

Whilst the limited number of observation point records relevant to the project area and surrounds have been included in the process, the modelling has been largely based on the combination of published habitat descriptions provided by experts and the presence of mapped

habitat surrogates such as vegetation communities, soil and geology types, land form, and landscape context (e.g. presence of or proximity to waterways and/or wetlands). Where relevant, further resolution of each model was influenced by the author's own experience in interpreting habitat utilisation and habitat suitability for such species.

A key assumption underpinning the model is that there is a suitable correlation between potential habitat and the model surrogates (e.g. regional ecosystem mapping). Where this could not be confidently upheld, potential habitat modelling was not undertaken (e.g. Squatter Pigeon (southern) *Geophaps scripta scripta*).

For the Squatter Pigeon (southern), there are no clear patterns of association with particular Regional Ecosystems (a key determinant within the species models) or even remnant vegetation cover *per se*. For example, Agnew (2007) reviewed central Queensland Squatter Pigeon (southern) records to assess associations with vegetation characteristics. That review found that 48.3% of the records were located within non-remnant environments only, with 13.6% of the total number of records located within remnant vegetation only¹⁰. The remaining data was associated with a combination of both remnant and non-remnant vegetation.

Whilst it is assumed that the project is likely to have residual impacts on the Squatter Pigeon, given the broad variety and extent of habitat within the region, and its relatively ubiquitous presence in this landscape, it is considered unlikely that these impacts will be significant for the species. Furthermore, it is considered that the proposed offsets for a variety of other species considered in this report have a high likelihood of accounting for the broad range of habitats used by this species, and as such, provide a suitable offset outcome for the Squatter Pigeon.

In interpreting the model outputs, a fundamental consideration is that the modeled outputs do not map definite habitat, only areas of potential habitat which support the broad habitat features which are more likely to contain the requisite microhabitat and condition factors that influence species-specific habitat use (e.g. the combination of cracking clays and gilgai favoured by the Ornamental Snake *Denisonia maculata*). Furthermore, the habitat surrogate being mapped regional ecosystems, does not account for actual habitat condition which can vary considerably depending on land management practices and potential levels of degradation facilitated by such site-specific practices.

In regard to that latter, the inclusion of the DERM's Biodiversity Planning Assessment¹¹ map layer, State Biodiversity Significance¹², was introduced into the habitat models on the assumption that this model surrogate provided representation of higher values in regard to habitat diversity/condition/resilience, tract size, context, and connectivity (amongst other important biodiversity values). In many cases, resolving the primary offset liability for a species was influenced by the conjunction between the suite of habitat model surrogates for that species and the State Biodiversity Significance mapping layer.

¹⁰ Total number of records analysed was 111. Only records with a location accuracy of <100m were used, though the majority of these records provide location accuracy to ± 10 m. Records were assessed in regards to the incidence of remnant and non-remnant vegetation within 200m of record location (see Agnew 2007).

¹¹ Biodiversity Planning Assessment (BPA) is the implementation of the Biodiversity Assessment and Mapping Methodology that results in a map and database information product maintained by the EPA (and resulting from expert input). The digital coverage results from a process of information collation, integration, analysis, interpretation, spatial data development and mapping (EPA 2002b).

¹² Using the seven diagnostic criteria identified in the Biodiversity Assessment and Mapping Methodology, areas of State Significance are assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales (EPA 2002b). Biodiversity Significance is defined as the ranked significance of an area according to specified biodiversity values to account for ecological concepts such as rarity, diversity, fragmentation, habitat condition, resilience, threats, and ecosystem processes (EPA 2002b).

Species model outputs were reviewed and where required, refined through assessment by the study team. This final stage of the process was undertaken to resolve areas of Primary and Secondary Habitat Values from each of species habitat models. Attachment A and Table 2-1 describe the base data and habitat descriptions relied upon, and the decision rules for the threatened species habitat modelling.

Areas included with the Primary Habitat Values category typically comprised a combination of the following: the species has been recorded within the Regional Ecosystem within the project area; and/or the presence of mapped Essential Habitat; and/or the presence of a Regional Ecosystem type where the species has been typically been recorded within the Bioregion and that RE is included within an area identified/mapped as State Biodiversity Significance (as per DERM's Biodiversity Planning Assessment). Areas included with the Secondary Habitat Values category typically comprised by a combination of the following: the presence of a Regional Ecosystem type where the species has been typically been recorded within the Bioregion and/or a Regional Ecosystem listed as a habitat factor within the VMA Essential Habitat Database and that RE is located external to an area identified/mapped as State Biodiversity Significance (as per DERM's Biodiversity Planning Assessment).

2.2.3. Threatened Species

As a result of the previous assessment process, modeling was prepared for 22 species listed as either threatened or near threatened under the EPBCA and/or NCA, being:

- Northern Quoll *Dasyurus hallucatus* – *Endangered* EPBCA
- Spotted-tailed Quoll *Dasyurus maculatus maculatus* – *Endangered* EPBCA and *Vulnerable* NCA
- Koala *Phascolarctos cinereus* – *Vulnerable* EPBCA
- Striped-tailed Delma *Delma labialis* - *Vulnerable* EPBCA and NCA
- Dunmall's Snake *Furina dunmali* - *Vulnerable* EPBCA and NCA
- Brigalow Scaly-foot *Paradelma orientalis* – *Vulnerable* EPBCA and NCA
- Yakka Skink *Egernia rugosa* – *Vulnerable* EPBCA and NCA
- Ornamental Snake *Denisonia maculata* – *Vulnerable* EPBCA and NCA
- Red Goshawk *Erythrorhynchus radiatus* - *Vulnerable* EPBCA and NCA
- Australian Painted Snipe *Rostratula australis* - *Vulnerable* EPBCA and NCA
- Black-throated Finch (southern) *Peophila cincta cincta* – *Endangered* EPBCA and *Vulnerable* NCA
- Little Pied Bat *Chalinolobus picatus* – *Near Threatened* NCA
- the skink *Ctenotus capricorni* – *Near Threatened* NCA
- Common Death Adder *Acanthophis antarcticus* – *Near Threatened* NCA
- Rough Frog *Cyclorana verrucosa* - *Near Threatened* NCA
- Cotton Pygmy Goose *Nettapus coromandelianus* - *Near Threatened* NCA
- Freckled Duck *Stictonetta naevosa* - *Near Threatened* NCA
- Black-necked Stork *Ephippiorhynchus asiaticus* - *Near Threatened* NCA
- Grey Goshawk *Accipiter novaehollandiae* - *Near Threatened* NCA
- Square-tailed Kite *Lophoictinia isura* - *Near Threatened* NCA
- Glossy-black Cockatoo *Calyptorhynchus lathami* - *Near Threatened* NCA
- Black-chinned Honeyeater *Meliphreptus gularis* - *Near Threatened* NCA

To prepare habitat models, the following base data for the study site was collated:

- The extent of the project disturbance footprint, including areas that will be cleared as part of constructing infrastructure;
- VMA RE and Remnant Vegetation mapping (Version 6.1 – DERM 2012c), Essential Habitat mapping (Version 3.1; DERM 2012a), and Regrowth Vegetation mapping (Version 2.1 – DERM 2012d);

- Biodiversity Planning Assessment mapping (DERM 2012e); and
- DERM watercourse and wetland mapping layers, including: VMA Queensland Regrowth Watercourses Version 2.1, Wetland Protection Area HES Wetland, Queensland Wetland Data – Wetlands, Wetland Management Area Wetland, and Wetland Management Area Trigger Area.

The abovementioned data was combined with a set of decision rules for threatened species to provide preliminary mapping of the extent of habitat proposed to be offset for each species for final reviews. Species model outputs were reviewed and where required, refined through assessment by the author.

The set of decision rules for modelling habitat for all threatened species is provided in Table 2-1. The data and habitat descriptions habitat drawn upon to develop the decision rules for each species is provided in Attachment C. Table 2-2 provides the final outputs of the offset assessment process for each of 22 threatened species.

Table 2-1 Decision Rules for Threatened Species Habitat Modelling

Species	Primary Habitat Values- Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
Northern Quoll <i>Dasyurus hallucatus</i>	Mapped REs: 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.8.1, 10.9.2, 10.9.5, 10.10.2, 10.10.3, 10.10.4, and 10.10.5.	Mapped REs: 11.7.1, 11.7.2, 11.8.3, 11.8.4, 11.8.5, 11.10.3, 11.10.4, 11.10.8, 11.11.19, 11.12.4, 11.12.12, 11.12.13, 11.12.14, 11.12.18, 11.12.19.	All Mapped REs within 3km of mapped REs: 10.7.1, 10.7.2, 10.7.3, 10.7.4, 10.7.5, 10.8.1, 10.9.2, 10.9.5, 10.10.2, 10.10.3, 10.10.4, and 10.10.5, within a mapped area of State Biodiversity Significance.	All Mapped REs within 3km of mapped REs: 11.7.1, 11.7.2, 11.8.3, 11.8.4, 11.10.3, 11.10.4, 11.10.8, 11.11.19, 11.12.4, 11.12.12, 11.12.13, 11.12.14, 11.12.18, 11.12.19, within a mapped area of State Biodiversity Significance.
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i>	Not applicable.	Mapped REs: 11.7.1, 11.7.2, 11.8.3, 11.8.4, 11.8.5, 11.10.3, 11.10.4, 11.10.8, 11.11.19, 11.12.4, 11.12.12, 11.12.13, 11.12.14, 11.12.18, 11.12.19.	Not applicable.	All Mapped REs within 3km of mapped REs: 11.7.1, 11.7.2, 11.8.3, 11.8.4, 11.10.3, 11.10.4, 11.10.8, 11.11.19, 11.12.4, 11.12.12, 11.12.13, 11.12.14, 11.12.18, 11.12.19, within a mapped area of State Biodiversity Significance.
Ornamental Snake <i>Denisonia maculata</i>	Land Zone 4 Regional Ecosystems (clay plains not associated with current alluvium) within a mapped area of State Biodiversity Significance or referable wetland (including trigger area).	Mapped REs 11.4.3, 11.4.6, 11.4.8, 11.4.9; OR Mapped REs 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2 within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	All land zone 4 Regional Ecosystems not mapped within an area of State Biodiversity Significance, and within 250m of a mapped 3rd, 4th, or 5th order stream or referable wetland (including trigger area).	All other Land Zone 4 Regional Ecosystems within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area) or referable wetland (including trigger area).
Black-throated Finch <i>Poephila cincta cincta</i>	Mapped REs 10.3.6, 10.3.9, 10.3.13, 10.3.14, 10.3.28, 10.4.8, 10.5.1, 10.5.5, 10.7.1, 10.7.10, and 10.7.11 within a mapped area of State Biodiversity Significance or within 600m of a waterbody or within 3km of a 3rd, 4th, or 5th order stream or referable wetland (including trigger area).	Mapped REs 11.3.12, 11.3.25b, 11.3.30, 11.3.25, 11.11.9, and 11.12.9 within a mapped area of State Biodiversity Significance or within 3km of a waterbody or within 3km of a 3rd, 4th, or 5th order stream, or referable wetland (including trigger area).	All land zone 3, 5, 7 and 10 Regional Ecosystems not mapped within an area of State Biodiversity Significance, and within 3km of a mapped 3rd, 4th, or 5th order stream or mapped waterbody or referable wetland (including trigger area).	All land zone 3 and 5 Regional Ecosystems not mapped within an area of State Biodiversity Significance, and within 3km of a mapped 3rd, 4th, or 5th order stream or mapped waterbody, or referable wetland (including trigger area).

Species	Primary Habitat Values - Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
Brigalow Scaly-foot <i>Paradelma orientalis</i>	Mapped REs: 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 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, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7, within a mapped area of State Biodiversity Significance.	Mapped REs: 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, 11.3.21, 11.3.22, 11.3.23, 11.3.24, 11.3.25, 11.3.26, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.4, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.7.8, 11.7.9, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.11, 11.10.12, 11.10.13, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 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, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7, not within a mapped area of State Biodiversity Significance.	Mapped REs: 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.4, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.7.8, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.11, 11.10.12, 11.10.13, not within a mapped area of State Biodiversity Significance.
Striped-tailed Delma <i>Delma labialis</i>	Not applicable.	All land zone 2, 3, and 12 REs north of the Bowen River within a mapped area of State Biodiversity Significance.	Not applicable.	All land zone 2, 3, and 12 REs north of the Bowen River, not mapped within an area of State Biodiversity Significance.

Species	Primary Habitat Values - Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
<p>Yakka Skink <i>Egernia rugosa</i></p>	<p>Mapped REs: 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, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 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, 10.4.9, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, and 10.10.7, within a mapped area of State Biodiversity Significance.</p>	<p>Mapped REs: 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.11, 11.4.12, 11.4.13, 11.4.9, 11.4.10, 11.4.11, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.18, 11.5.19, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.7.8, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.2, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.11.21, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, and 11.12.21, within a mapped area of State Biodiversity Significance.</p>	<p>Mapped REs: 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, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 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, 10.4.9, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, and 10.10.7, not within a mapped area of State Biodiversity Significance.</p>	<p>Mapped REs: 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.11, 11.4.12, 11.4.13, 11.4.9, 11.4.10, 11.4.11, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.18, 11.5.19, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.7.8, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.2, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.11.21, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, and 11.12.21, within a mapped area of State Biodiversity Significance.</p>
<p>Dunmall's Snake <i>Furina dunmalli</i></p>	<p>Not applicable.</p>	<p>Between 2 km south of the Belyando River crossing to 2km north of the Suttor River crossing, all land zone 4 mapped REs.</p>	<p>Not applicable.</p>	

Species	Primary Habitat Values - Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
Red Goshawk <i>Erythrotriorchis radiatus</i>	All land zone 3 mapped REs within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.1, 11.3.4, 11.3.7, 11.3.25, 11.5.9, 11.8.13, 11.10.4, 11.10.8, 11.11.1, 11.11.15, 11.12.1, 11.12.4, 11.12.12, 11.12.13, 11.12.14, and 11.12.19 within a mapped area of State Biodiversity Significance.	All land zone 3 mapped REs, associated with a 3rd, 4th, or a 5th stream order, and not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.1, 11.3.4, 11.3.7, 11.3.25, 11.3.30, 11.5.9, 11.8.13, 11.10.4, 11.10.8, 11.11.1, 11.11.15, 11.12.1, 11.12.4, 11.12.12, 11.12.13, 11.12.14, and 11.12.19 not within a mapped area of State Biodiversity Significance, but within 1km of a permanent watercourse, or ferrable wetland (including trigger area).
Australian Painted Snipe <i>Rostratula australis</i>	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, not within a mapped area of State Biodiversity Significance.
Koala <i>Phascolarctos cinereus</i>	Mapped REs: 10.3.1, 10.3.2, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.14, 10.3.27, 10.3.28, 10.5.1, 10.5.5, and 10.7.1, within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.37, 11.4.2, 11.4.7, 11.5.3, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.12.0, 11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, 11.12.13, and 11.12.19, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.1, 10.3.2, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.14, 10.3.27, 10.3.28, 10.5.1, 10.5.5, and 10.7.1, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.37, 11.4.2, 11.4.7, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.12.0, 11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, 11.12.13, and 11.12.19, not within a mapped area of State Biodiversity Significance.
Little Pied Bat <i>Chalinolobus picatus</i>	Mapped REs: 10.3.6, 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, 10.3.24 and 10.7.3, within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.37, 11.4.2, 11.4.7, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.12.0, 11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, 11.12.13, and 11.12.19, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.6, 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, 10.3.24 and 10.7.3, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.37, 11.4.2, 11.4.7, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.12.0, 11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, 11.12.13, and 11.12.19, not within a mapped area of State Biodiversity Significance.

Species	Primary Habitat Values - Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
<i>Ctenotus capricorni</i>	Mapped REs: 10.3.27, 10.5.1, 10.5.5, 10.5.11, 10.5.12, and 10.7.3, within a mapped area of State Biodiversity Significance.	Not applicable.	Mapped REs: 10.3.27, 10.5.1, 10.5.5, 10.5.11, 10.5.12, and 10.7.3, not within a mapped area of State Biodiversity Significance.	Not applicable.
Common Death Adder <i>Acanthophis antarcticus</i>	Mapped REs: 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, and 10.10.6, within a mapped area of State Biodiversity Significance.	Mapped REs: 11.10.3, 11.10.4, 11.10.7, 11.10.8, and 11.10.12, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, and 10.10.6, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.10.3, 11.10.4, 11.10.7, 11.10.8, and 11.10.12, not within a mapped area of State Biodiversity Significance.
Rough Frog <i>Cyclorana verrucosa</i>	Not applicable.	Land Zone 4 Regional Ecosystems within a mapped area of State Biodiversity Significance (mine site to 2km north of the Suttor River crossing).	Not applicable.	Land Zone 4 Regional Ecosystems not within a mapped area of State Biodiversity Significance (mine site to 2km north of the Suttor River crossing).
Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).
Freckled Duck <i>Stictonetta naevosa</i>	Mapped REs: 10.3.13, 10.3.14, 10.3.15, and 10.3.23, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.15, 11.3.25, 11.3.27, and 11.3.37, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 10.3.13, 10.3.14, 10.3.15, and 10.3.23, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.15, 11.3.25, 11.3.27, and 11.3.37, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 10.3.13, 10.3.14, 10.3.15, 10.3.21, 10.3.22, 10.3.23, and 10.3.24, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).	Mapped REs: 11.3.12, 11.3.15, 11.3.25, 11.3.27, and 11.3.37, not within a mapped area of State Biodiversity Significance, or referable wetland (including trigger area).
Grey Goshawk <i>Accipiter novaehollandiae</i>	Mapped RE 10.5.1 and all land zone 10 REs within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.1, 11.3.4, 11.3.7, 11.3.25, 11.3.30, 11.5.9, 11.8.13, 11.10.4, 11.10.8, 11.11.1, 11.11.15, 11.12.1, 11.12.12, 11.12.13, 11.12.14, and 11.12.19 within a mapped area of State Biodiversity Significance.	Mapped RE 10.5.1 and all land zone 10 REs not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.1, 11.3.4, 11.3.7, 11.3.25, 11.3.30, 11.5.9, 11.8.13, 11.10.4, 11.10.8, 11.11.1, 11.11.15, 11.12.1, 11.12.4, 11.12.12, 11.12.13, 11.12.14, and 11.12.19, not within a mapped area of State Biodiversity Significance.

Species	Primary Habitat Values - Desert Uplands Bioregion	Primary Habitat Values - Brigalow Belt Bioregion	Secondary Habitat Values - Desert Uplands Bioregion	Secondary Habitat Values - Brigalow Belt Bioregion
Square-tailed Kite <i>Lophoictinia isura</i>	Mapped REs: 10.3.13, 10.3.14, 10.5.1, 10.5.5 and all land zone 10 REs, within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.5.3, 11.5.9, 11.5.12, 11.5.3, 11.5.9, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.9, 11.11.10, 11.11.11, 11.11.6, 11.11.9, 11.11.20, 11.11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, and 11.12.13, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.13, 10.3.14, 10.5.1, 10.5.5 and all land zone 10 REs, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.20, 11.11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, and 11.12.13, not within a mapped area of State Biodiversity Significance.
Glossy-black Cockatoo <i>Calyptorhynchus lathami</i>	Mapped REs: 10.3.13 and 13.3.14 within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.25, 11.3.32, 11.4.7, 11.4.9, 11.5.2, and 11.9.13, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.13 and 13.3.14 not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.25, 11.3.32, 11.4.7, 11.4.9, 11.5.2, and 11.9.13, not within a mapped area of State Biodiversity Significance.
Black-chinned Honeyeater <i>Melithreptus gularis</i>	Mapped REs: 10.3.8, 10.3.27, 10.5.1, 10.7.11, and all land zone 10 REs within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.20, 11.11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, and 11.12.13, within a mapped area of State Biodiversity Significance.	Mapped REs: 10.3.8, 10.3.27, 10.5.1, 10.7.11, and all land zone 10 REs, not within a mapped area of State Biodiversity Significance.	Mapped REs: 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.7, 11.3.9, 11.3.10, 11.3.25, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.5.3, 11.5.9, 11.5.12, 11.5.17, 11.8.4, 11.8.5, 11.8.14, 11.8.15, 11.9.9, 11.10.12, 11.11.1, 11.11.6, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.20, 11.11.12.1, 11.12.2, 11.12.9, 11.12.10, 11.12.11, and 11.12.13, not within a mapped area of State Biodiversity Significance.

Table 2-2 Summary of Compensatory Offsets for Threatened Fauna

Species	Primary Habitat - Desert Uplands Bioregion (Ha)	Primary Habitat - Brigalow Belt Bioregion (Ha)	Secondary Habitat - Desert Uplands Bioregion (Ha)	Secondary Habitat - Brigalow Belt Bioregion (Ha)
Ornamental Snake <i>Denisonia maculata</i>	0.00	147.50	0.00	37.79
Black-throated Finch <i>Poephila cincta cincta</i>	0.00	37.72	13.66	51.83
Brigalow Scaly-foot <i>Paradelma orientalis</i>	3.22	477.22	12.46	116.43
Northern Quoll <i>Dasyurus hallucatus</i>	0.00	62.74	0.00	228.67
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i>		62.74	0.00	228.67
Striped-tailed Delma <i>Delma labialis</i>		252.87	0.00	149.26
Yakka Skink <i>Egernia rugosa</i>	3.22	885.27	12.46	237.05
Dunmall's Snake <i>Furina dunmali</i>	0.00	47.86	0.00	57.42
Red Goshawk <i>Erythrotriorchis radiatus</i>	3.86	379.03	13.66	107.46
Australian Painted Snipe <i>Rostratula australis</i>	0.00	3.67	0.00	4.19
Koala <i>Phascolarctos cinereus</i>	0.00	659.77	0.00	194.46
Little Pied Bat <i>Chalinolobus picatus</i>	0.00	659.77	0.00	194.46
<i>Ctenotus capricorni</i>	0.00	0.00	0.00	0.00
Common Death Adder <i>Acanthophis antarcticus</i>	0.00	99.59	0.00	0.00
Rough Frog <i>Cyclorana verrucosa</i>	0.00	37.79	0.00	10.06
Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	0.00	3.67	0.00	4.19
Freckled Duck <i>Stictonetta naevosa</i>	0.00	3.67	0.00	4.19
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	0.00	3.67	0.00	4.19
Grey Goshawk <i>Accipiter novaehollandiae</i>	0.00	379.03	0.00	110.66

Species	Primary Habitat - Desert Uplands Bioregion (Ha)	Primary Habitat - Brigalow Belt Bioregion (Ha)	Secondary Habitat - Desert Uplands Bioregion (Ha)	Secondary Habitat - Brigalow Belt Bioregion (Ha)
Square-tailed Kite <i>Lophoictinia isura</i>	0.00	306.64	0.00	101.27
Glossy-black Cockatoo <i>Calyptorhynchus lathami</i>	0.00	42.52	0.00	34.35
Black-chinned Honeyeater <i>Melithreptus gularis</i>	0.00	306.64	0.00	101.27

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Attachment A Initial List of Threatened Species and Likelihood of Site Occurrence

Species	Status	Likelihood of Occurrence
Ornamental Snake <i>Denisonia maculata</i>	Vulnerable	Known
Squatter Pigeon <i>Geophaps scripta scripta</i>	Vulnerable	Known
Little Pied Bat <i>Chalinolobus picatus</i>	Near Threatened	Known
Black-throated Finch <i>Poephila cincta cincta</i>	Endangered	Likely
Brigalow Scaly-foot <i>Paradelma orientalis</i>	Vulnerable	Likely
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Near Threatened	Likely
Grey Goshawk <i>Accipiter novaehollandiae</i>	Near Threatened	Likely
Square-tailed Kite <i>Lophoictinia isura</i>	Near Threatened	Likely
Black-chinned Honeyeater <i>Melithreptus gularis</i>	Near Threatened	Likely
Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	Near Threatened	Likely
Northern Quoll <i>Dasyurus hallucatus</i>	Endangered	Possible
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i>	Endangered	Possible
Striped-tailed Delma <i>Delma labialis</i>	Vulnerable	Possible
Yakka Skink <i>Egernia rugosa</i>	Vulnerable	Possible
Dunmall's Snake <i>Furina dunmalli</i>	Vulnerable	Possible
Red Goshawk <i>Erythrorhynchus radiatus</i>	Vulnerable	Possible
Australian Painted Snipe <i>Rostratula australis</i>	Vulnerable	Possible
<i>Ctenotus capricorni</i>	Near Threatened	Possible
Common Death Adder <i>Acanthophis antarcticus</i>	Near Threatened	Possible
Rough Frog <i>Cyclorana verrucosa</i>	Near Threatened	Possible
Freckled Duck <i>Stictonetta naevosa</i>	Near Threatened	Possible
Glossy-black Cockatoo <i>Calyptorhynchus lathami</i>	Near Threatened	Possible
Northern Hairy-Nosed Wombat <i>Lasiorhinus krefftii</i>	Endangered	Other
Retro Slider <i>Lerista allanae</i>	Endangered	Other
Greater Long-eared Bat <i>Nyctophilus corbeni</i> (south- eastern)	Vulnerable	Other
Black-Breasted Button Quail <i>Turnix melanogaster</i>	Vulnerable	Other
Star Finch <i>Neochmia ruficauda ruficauda</i>	Endangered	Other
Regent Honeyeater <i>Anthochaera phrygia</i>	Endangered	Other
Swift Parrot <i>Lathamus discolor</i>	Endangered	Other
Crimson Finch <i>Neochmia phaeton phaeton</i>	Endangered	Other
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	Vulnerable	Other
Mount Cooper Striped Lerista <i>Lerista vittata</i>	Vulnerable	Other

Species	Status	Likelihood of Occurrence
Collared Delma <i>Delma torquata</i>	Vulnerable	Other
Blue Whale <i>Balaenoptera musculus</i>	Endangered	Other
Greater Large-eared Horseshoe Bat (large form) <i>Rhinolophus philippinensis</i>	Endangered	Other
Julia Creek Dunnart <i>Sminthopsis douglasi</i>	Endangered	Other
Bridled Nailtail Wallaby <i>Onychogalea fraenata</i>	Endangered	Other
Northern Bettong <i>Bettongia tropica</i>	Endangered	Other
Loggerhead turtle <i>Caretta caretta</i>	Endangered	Other
Leatherback Turtle <i>Dermochelys coriacea</i>	Endangered	Other
Olive Ridley Turtle <i>Lepidochelys olivacea</i>	Endangered	Other
Humpback Whale <i>Megaptera novaeangliae</i>	Vulnerable	Other
Spectacled Flying-fox <i>Pteropus conspicillatus</i>	Vulnerable	Other
Water Mouse <i>Xeromys myoides</i>	Vulnerable	Other
Western Quoll <i>Dasyurus geoffroii geoffroii</i>	Vulnerable	Other
Green Turtle <i>Chelonia mydas</i>	Vulnerable	Other
Hawksbill Turtle <i>Eretmochelys imbricata</i>	Vulnerable	Other
Flatback Turtle <i>Natator depressus</i>	Vulnerable	Other
Fitzroy River Turtle <i>Rheodytes leukops</i>	Vulnerable	Other
White-bellied Storm-Petrel (Tasman Sea) <i>Fregetta grallaria grallaria</i>	Vulnerable	Other
Plains Wanderer <i>Pedionomus toquatus</i>	Vulnerable	Other

Attachment B Threatened Species Habitat Data

Species	Status	Base Data and Habitat Descriptions
Ornamental Snake <i>Denisonia maculata</i>	Vv	<p>VMA Essential Habitat Database (Habitat Factors) - 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.4, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 11.4.13. Under litter/fallen timber and in wide soil cracks, in riparian woodland/open forest and shrub/woodland including Brigalow <i>Acacia harpophylla</i>. Near freshwater waterholes/creeks. Deep cracking clay and sandy loam substrates. SEWPac 2012 (SPRAT) - Known to prefer woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in Queensland Regional Ecosystem Land Zone 4, but also lake margins and wetlands. Refuge habitat during dry periods typically within soil cracks on gilgai mounds within the habitat area. Preferred habitat is within, or close to, habitat that is favoured by its prey - frogs. In Queensland, most commonly recorded in RE 11.4.3, though also 11.4.3, 11.4.6, 11.4.8, 11.4.9. Other records for RE 11.3.3 and 11.5.16.</p>
Squatter Pigeon <i>Geophaps scripta scripta</i>	Vv	<p>VMA Essential Habitat Database (Habitat Factors) - DUB REs: 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. BBB REs: 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, 11.11.12, 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, 11.12.12, 11.12.13, 11.12.14, 11.12.17, 11.12.20. 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. Gravelly ridges, traprock and river flats. Morgan et al. 2002 - REs: 10.3.1, 10.3.10, 10.3.12, 10.3.13, 10.3.14, 10.3.2, 10.3.22, 10.3.28, 10.3.3, 10.3.4, 10.3.6, 10.3.7, 10.3.9, 10.4.8, 10.5.11, 10.5.5, 10.7.1, 10.7.10, 10.7.7, & 10.9.2. DERM 2012 - High habitat values associated with REs 10.3.6, 10.3.28 and 10.5.6 (where these occur within or adjacent to significant wetlands).</p>
Black-throated Finch <i>Poephila cincta cincta</i>	Ev	<p>VMA Essential Habitat Database (Habitat Factors) - 11.2.1, 11.2.5, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 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, 11.3.20, 11.3.23, 11.3.25, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.35, 11.3.36, 11.3.37, 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, 11.7.3, 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, 11.11.2, 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, 11.11.17, 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, 11.12.11, 11.12.12, 11.12.13, 11.12.14, 11.12.17, 11.12.20. Grassy open woodland dominated by Eucalyptus, <i>Acacia</i> and <i>Melaleuca</i> spp. (e.g. <i>E. platyphylla</i>, <i>E. erythrophloia</i>, <i>E. melanophloia</i>, <i>E. brownii</i>, <i>E. whitei</i>, <i>E. similis</i>, <i>E. camaldulensis</i>, <i>Corymbia plena</i>, <i>C. dallachiana</i>, <i>C. setosa</i>, <i>M. viridiflora</i>, <i>M. leucodendra</i>) with high diversity ground cover of perennial grasses (e.g. <i>Heteropogon</i>, <i>Themeda</i>, <i>Bothriochloa</i>, <i>Eulalia</i>, <i>Enneapogon</i>, <i>Triodia</i>, <i>Triopogon</i>, <i>Chrysopogon</i>, <i>Aristida</i>) and shrub layer usually sparse or absent. Nest in topmost twiggy branches of eucalypt, occasionally in tree hollow or termite mound, up to 12m above ground. 2007 Recovery Plan - REs where southern subspecies has been recorded in north Queensland since 1994: 10.3.6, 10.3.9, 10.3.13, 10.3.28, 10.4.8, 10.5.1, 10.5.5, 10.7.11, 11.3.12, 11.3.27, 11.3.30, 11.3.25, 11.11.9. NRA (2006) - RE 11.12.9 should be regarded as potentially supporting nesting habitat. Morgan et al. 2002 - REs: 10.3.6, 10.3.9, 10.3.13, 10.3.28, 10.4.8, 10.5.1, 10.5.5, & 10.7.11. DERM 2012 - High habitat values associated with REs 10.3.13, 10.3.14, 10.3.6 and 10.3.28 (where these occur within or adjacent to significant wetlands), and all land zone 10 REs.</p>

Species	Status	Base Data and Habitat Descriptions
<p>Brigalow Scaly-foot <i>Paradelima orientalis</i></p>	<p>Vw</p>	<p>VMA Essential Habitat Database (Habitat Factors) - DUB REs: 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 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, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. BBB REs: 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.10, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.5, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.18, 11.11.19, 11.12.1, 11.12.2, 11.12.3, 11.12.4, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.18, 11.12.19, 11.12.20, 11.12.21. Under logs and ground debris in acacia (<i>Acacia harpophylla</i> & <i>A. falciiformis</i>) woodland, or eucalypt (e.g. <i>Corymbia citriodora</i>, <i>Eucalyptus crebra</i>, or <i>E. populnea</i>) woodland and open forest with sparse grass cover or <i>Callitris/Allocasuarina</i> subcanopy; also vine thicket; low open <i>Acacia</i> cambagei woodland and <i>Eremophila mitchellii</i> shrubland with tussock grass understorey. Altitude: Sea level to 800m. Position in landscape: Grey/black cracking clay alluvial, sandy clay or sandstone substrates. SEWPaC 2012 (SPRAT) - Core habitat occurs mostly within the Brigalow Belt South bioregion. The species is found in a wide variety of remnant and non-remnant open forest to woodland habitats. The species is known to persist in highly disturbed vegetation types, for example those areas invaded by Buffel Grass (<i>Cenchrus ciliaris</i>), <i>Parthenium</i> (<i>Parthenium hysterophorus</i>), and other weeds. The species occurs within the following Queensland Regional Ecosystem Land Zones: LZ 3 - Alluvium river and creek flats, LZ 4 - Clay plains not associated with current alluvium; LZ 5 - Old loamy and sandy plains; LZ 7 - Ironstone jump-ups, LZ 8 - Basalt plains and hills (only where close to the interface with LZ 10), LZ 9 - Undulating country on fine-grained sedimentary rocks, and LZ 10 - Sandstone ranges. SEWPaC (2011) - Open-forests to woodlands in QLD RE Land Zones 3, 4, 5, 7, 8 (near the periphery of LZ 10), 9 and 10. Kutt et al. 2003 - Gidgee <i>Acacia</i> cambagei woodland with occasional <i>Eremophila</i> and <i>Carissa</i>, and a ground cover of forbs and grasses with abundant fallen timber on cracking alluvial clays (Ucanbah Station). DERM 2012 - High habitat values associated with RE 10.9.2 (where these occur in good condition).</p>
<p>Northern Quoll <i>Dasyurus hallucatus</i></p>	<p>E</p>	<p>VMA Essential Habitat Database (Habitat Factors) - There are no habitat factors listed as this species is not listed as a threatened species under the NCA. SEWPaC 2012 - Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds. 2010 Recovery Plan - Northern quolls do not have highly specific habitat requirements and occur in a variety of habitats across their range. Therefore habitat critical to survival is that where northern quolls are least exposed to threats or least likely to be in the future. Given the threats outlined (Cane Toads, feral predators, inappropriate fire regimes, broad-scale baiting, hunting, & disease), two particular broad habitat types fall into this category: rocky areas and offshore islands. SEWPaC 2012 - Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds. 2010 Recovery Plan - Northern quolls do not have highly specific habitat requirements and occur in a variety of habitats across their range. Therefore habitat critical to survival is that where northern quolls are least exposed to threats or least likely to be in the future. Given the threats outlined (Cane Toads, feral predators, inappropriate fire regimes, broad-scale baiting, hunting, & disease), two particular broad habitat types fall into this category: rocky areas and offshore islands.</p>

Base Data and Habitat Descriptions		
Species	Status	VMA Essential Habitat Database (Habitat Factors)
Spotted-tailed Quoll <i>Dasyurus maculatus maculatus</i>	e	<p>VMA Essential Habitat Database (Habitat Factors) - 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, 11.3.6, 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, 11.3.23, 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, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.5, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.18, 11.11.19, 11.11.20, 11.11.21, 11.12.1, 11.12.2, 11.12.3, 11.12.4, 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, 11.12.15, 11.12.17, 11.12.19, 11.12.20, 11.12.21. Sth - Large tracts of rainforest (notophyll & mesophyll vine forest); occasionally recorded in adjacent wet sclerophyll forest. Den at ground level, e.g. hollow buttress roots, rock piles. Nth - Rainforest, wet and dry structurally complex sclerophyll forest (e.g. <i>Eucalyptus andrewsii</i>, <i>E. saligna</i>, <i>E. tereticornis</i> & <i>Corymbia intermedia</i>) on productive soils (gullies & flats) and in rocky areas (ridges), also open woodland (<i>E. alba</i>, <i>E. melliodora</i>, <i>Callitris glaucophylla</i>), coastal heathland (adjacent to forest) and riparian forest. Dens in caves, rock crevices and hollow logs.</p>
Striped-tailed Delma <i>Delma labialis</i>	Vv	<p>VMA Essential Habitat Database (Habitat Factors) - 11.1.4, 11.2.1, 11.2.2, 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.2, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.11.21, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 11.12.21. In leaf litter and under logs/debris in low open tropical forest, eucalypt (<i>E. platyphylla</i>) open forest with <i>Allocasuarinas</i> and <i>Xanthorrhoea</i>, and woodland with grassy understorey, also wet sclerophyll forest, seasonally dry <i>Melaleuca viridiflora</i> swamp and strand thicket. SEWPaC (2012) Forests to open-woodlands and adjacent exposed rocky slopes to 800 metres above sea level in QLD RE Land Zones 2, 3 and 12.</p>

Species	Status	Base Data and Habitat Descriptions
<p>Yakka Skink <i>Egernia rugosa</i></p>	<p>Vv</p>	<p>VMA Essential Habitat Database (Habitat Factors) - DUB RES: 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, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 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, 10.4.9, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. BBB RES - 11.1.4, 11.2.1, 11.2.2, 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.2, 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, 11.11.13, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.11.20, 11.11.21, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 11.12.21. Vegetation Community: Among dense ground vegetation, fallen timber or rock outcrops, in open and low closed scrub, sandplain areas, woodland (brigalow), open dry sclerophyll (ironbark) and lancewood forest. Altitude: 100-400m. SEWPaC 2012 - Known to occur in open dry sclerophyll forest, woodland and scrub. The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions. Occurs in a wide variety of vegetation types within Queensland Regional Ecosystem Land Zones: LZ 3 Alluvium (river and creek flats), LZ 4 Clay plains (not associated with current alluvium), LZ 5 Old loamy and sandy plains, LZ 7 Ironstone jump-ups, LZ 9 Undulating country on fine-grained sedimentary rocks, and LZ 10 Sandstone ranges. SEWPaC (2011) - The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions. Open-forests to low-woodlands and scrub in QLD RE Land Zones (LZ) 3, 4, 5, 7, 8, 9, 10 and 12 (LZ 8 not considered core habitat; LZ 12 in Wet Tropics bioregion only). Colonies have been found in large hollow logs, cavities or burrows under large fallen trees, tree stumps, logs, stick-raked piles, large rocks and rock piles, dense ground-covering vegetation, and deeply eroded gullies, tunnels and sinkholes.</p>
<p>Dunmall's Snake <i>Furina dunmali</i></p>	<p>Vv</p>	<p>VMA Essential Habitat Database (Habitat Factors) - 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.5, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.15, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.3, 11.8.4, 11.8.5, 11.8.6, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.8, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.2, 11.11.3, 11.11.4, 11.11.5, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.12, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.18, 11.11.19, 11.11.20, 11.11.21, 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, 11.12.15, 11.12.16, 11.12.17, 11.12.19, 11.12.20, 11.12.21. Under fallen timber in Brigalow Acacia harpophylla forest, vine scrub and woodland and Callitris glaucophylla woodland and dry sclerophyll forest (Eucalyptus crebra, E. blakelyi, C. glaucophylla) with shrubby or mixed shrub-grass ground cover. Deeply cracking grey to black clay and clay loam substrates.</p>

Base Data and Habitat Descriptions		
Species	Status	
Red Goshawk <i>Erythrotriorchis radiatus</i>	Vv	<p>VMA Essential Habitat Database (Habitat Factors) - 11.1.4, 11.2.1, 11.2.2, 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, 11.3.26, 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, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.1, 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, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.19, 11.12.0, 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, 11.12.19, 11.12.20, 11.12.21. Tall open forest to open forest (Eucalyptus saligna, E. pilularis, Corymbia citriodora), edge of rainforest/vine thicket (especially Araucarian notophyll vine forest), tall woodland (including savannah/semi-open woodland, e.g. E. alba, and open riparian E. camaldulensis in dry areas), and along forested rivers (including Melaleuca swamp forest and riparian Casuarina sp.) and near wetlands; preference for a mosaic of tall vegetation types (forest/woodland) with permanent water, high bird (prey) density; often in remote terrain (gorge/escarpment country). Nest in tall eucalypt or melaleuca (7-40m above ground) in undisturbed forest/woodland; restricted to trees >20m tall within 1km of permanent watercourse or wetland.</p>
Australian Painted Snipe <i>Rostratula australis</i>	Vv	<p>VMA Essential Habitat Database (Habitat Factors) - All regional ecosystems within the stream/wetland buffer as determined by VMA code. 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. DERM 2012 - High habitat values associated with REs 10.5.5, 10.3.13, and 10.3.14 (where these occur within or adjacent to significant wetlands).</p>
Koala <i>Phascolarctos cinereus</i>	V	<p>VMA Essential Habitat Database (Habitat Factors) - There are no habitat factors listed as this species as it is not listed as a threatened species under the NCA outside of the south-east Queensland bioregion. Morgan et al. 2002 - REs: 10.3.1, 10.3.2, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.14, 10.3.27, 10.3.28, 10.5.1, 10.5.5, & 10.7.1. Ellis et al. 2002 - Fodder trees, in order of decreasing proportion of the diet: Eucalyptus populnea, E. crebra, E. terreticornis, E. cambageana, E. melanophloia, and Corymbia dallachiana (Clermont). Ellis et al. 1995 - Fodder tree species (though not ranked in terms of dietary composition): E. orgadophylla, E. crebra, E. terreticornis, and E. melanophloia (Springsure).</p>

Species	Status	Base Data and Habitat Descriptions
Little Pied Bat <i>Chalinolobus picatus</i>	nt	<p>VMA Essential Habitat Database (Habitat Factors) - DUB RES: 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 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, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. BBB RES: 11.1.4, 11.2.1, 11.2.2, 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.2, 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, 11.11.13, 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, 11.12.11, 11.12.12, 11.12.14, 11.12.15, 11.12.16, 11.12.17, 11.12.18, 11.12.19, 11.12.20, 11.12.21. . Vegetation Community: Dry open forest and woodland (e.g. <i>Eucalyptus melanophloia</i>, <i>E. populnea</i>, <i>E. crebra</i>, <i>E. moluccana</i>, <i>E. tereticornis</i>, <i>Corymbia citriodora</i>, <i>C. tessellaris</i>), in more arid areas found in riparian areas (e.g. <i>Allocasuarina</i> with <i>E. dealbata</i>/<i>E. fibrosa</i>, and chenopod shrubland. Altitude: Sea level to 850m. Morgan et al. 2002 - RES: 10.3.6, 10.3.14, & 10.7.3. The records from the Desert Uplands indicate riparian and escarpment habitats are important for the species in the bioregion. DERM 2012 - High habitat values associated with REs 10.3.6 (where these occur within or adjacent to significant wetlands) and 10.7.3.</p>
<i>Ctenopus capricorni</i>	nt	<p>VMA Essential Habitat Database (Habitat Factors) - RES: 10.3.1, 10.3.2, 10.3.3, 10.3.4, 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. Vegetation Community: Semi-arid, open woodland/shrubland with understorey of shrubs, soft tussock grasses and <i>Triodia</i> hummock grass. Altitude: 100-400m. Other: Sandy substrates. Morgan et al. 2002 - RES: 10.3.27, 10.5.1, 10.5.5, 10.5.11, & 10.5.12. Restricted to sandy open woodlands habitats in the southern Desert Uplands on the Alice Tableland. DERM 2012 - High habitat values associated with REs 10.5.5 (where these occur within or adjacent to significant wetlands) and 10.7.7.</p>
Common Death Adder <i>Acanthophis antarcticus</i>	nt	<p>VMA Essential Habitat Database (Habitat Factors) - DUB RES: 10.3.5, 10.3.6, 10.3.7, 10.3.9, 10.3.10, 10.3.11, 10.3.12, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.17, 10.3.19, 10.3.20, 10.3.21, 10.3.22, 10.3.23, 10.3.25, 10.3.27, 10.3.28, 10.3.29, 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, 10.4.9, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.7.6, 10.7.7, 10.7.8, 10.7.9, 10.7.10, 10.7.11, 10.7.12, 10.9.1, 10.9.2, 10.9.3, 10.9.5, 10.9.6, 10.9.7, 10.9.8, 10.10.1, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. BBB RES: 11.1.4, 11.2.1, 11.2.2, 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, 11.3.12, 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, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.2, 11.4.3, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 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, 11.11.2, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.17, 11.11.19, 11.12.0, 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, 11.12.16, 11.12.17, 11.12.18, 11.12.19, 11.12.20, 11.12.21. . Vegetation community: Under deep leaf litter or low foliage in shrubland (heathland), woodland and tall forest, especially undisturbed eucalypt forest. Altitude: Sea level to 950m. Morgan et al. 2002 - RES: 10.3.27 & 10.10.5. DERM 2012 - High habitat values associated with all land zone 10 REs (where these are of good condition).</p>

Base Data and Habitat Descriptions	
Species	Status
Rough Frog <i>Cyclorana verrucosa</i>	nt
Cotton Pygmy Goose <i>Nettapus coromandelianus</i>	nt
Freckled Duck <i>Stictonetta naevosa</i>	nt
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	nt
Grey Goshawk <i>Accipiter novaehollandiae</i>	nt

VMA Essential Habitat Database (Habitat Factors) - BBB RES: 11.1.2, 11.1.4, 11.2.1, 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, 11.3.12, 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, 11.3.27, 11.3.28, 11.3.29, 11.3.30, 11.3.32, 11.3.33, 11.3.34, 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, 11.5.10, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.3, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 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, 11.9.11, 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, 11.11.2, 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, 11.11.17, 11.11.19, 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, 11.12.16, 11.12.17, 11.12.18, 11.12.20. **No DUB RES.** Closed and open woodlands, scrubland and open grassland (including cleared farmland). Black-soil/heavy clay substrates.

VMA Essential Habitat Database (Habitat Factors) - RES: All regional ecosystems within the stream/wetland buffer as determined by VMA code. Vegetation community: Still, deep, permanent, freshwater lagoon, swamp (e.g. paperbark) and river covered with aquatic herbage, e.g. *Nymphaea* and *Hydrilla* spp.; seasonal shift in habitat use – swamps & creeks (wet), lagoon (wet-early dry) and river/lake (late dry). Altitude: 100-500m. **Morgan et al. 2002** - RES: 10.3.3, 10.3.6, 10.3.13, 10.3.14, 10.4.8, & 10.5.5. Generally more likely to occur in wetlands and artificial water bodies of Subregion 3 (e.g. Lake Powlathanga), though may occur sporadically and seasonally in other wetlands like Cauckingurra Swamp. **DERM 2012** - High habitat values associated with RES 10.3.13 and 10.3.14 (where these occur within or adjacent to significant wetlands).

VMA Essential Habitat Database (Habitat Factors) - RES: All regional ecosystems within the stream/wetland buffer as determined by VMA code. Vegetation community: Quiet freshwater lake, lagoon, swamp (swampy grassland) and saline lake; breed on ephemeral/permanent inland wetlands with extensive *cumbungi*. *Typha* spp. and lignum *Muehlenbeckia cunninghamii/fluventis*; in non-breeding or dry periods move to large permanent wetlands. Altitude: Sea level to 200m. **Morgan et al. 2002** - RES: 10.3.6, 10.3.14, 10.3.15, 10.3.23, & 10.5.5. Occurs sporadically in wetlands, riparian areas and artificial water-bodies. Population numbers fluctuate with climatic conditions. Thought to be relatively stable, though difficult to assess. Its occurrence in Subregion 2 in both woodland and wetland systems, suggest this species visits the Lake and riparian areas during wet periods and occasionally utilises large artificial dams and water points. **DERM 2012** - High habitat values associated with RES 10.3.13 and 10.3.14 (where these occur within or adjacent to significant wetlands).

VMA Essential Habitat Database (Habitat Factors) - RES: All regional ecosystems within the stream/wetland buffer as determined by VMA code. Vegetation Community: Extensive semi-permanent to permanent shallow wetlands - swamps, lakes and wet heathlands with some tall emergent vegetation associated with coastal wetlands (including tidal flats & mangroves), river floodplains and open woodland (eucalypt and melaleuca); also uses irrigated lands, sewage ponds and grassland. Nest in wide stick platform in top of tree or stump (up to 30m high) in isolated part of freshwater swamp. Altitude: Sea level to 1000m. **Morgan et al. 2002** - RES: 10.3.2, 10.3.6, 10.3.10, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.4.8, & 10.5.5. **DERM 2012** - High habitat values associated with RES 10.5.5, 3.13 and 10.3.14 (where these occur within or adjacent to significant wetlands).

VMA Essential Habitat Database (Habitat Factors) - DUB RES: 10.3.11, 10.3.14, 10.3.19, 10.3.20, 10.3.30, 10.3.31, 10.4.3, 10.4.7, 10.7.3, 10.7.5, 10.10.1, 10.10.4. **BBB RES:** 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, 11.3.6, 11.3.7, 11.3.8, 11.3.9, 11.3.10, 11.3.11, 11.3.12, 11.3.14, 11.3.17, 11.3.18, 11.3.19, 11.3.23, 11.3.25, 11.3.26, 11.3.27, 11.3.29, 11.3.30, 11.3.35, 11.3.36, 11.3.37, 11.3.38, 11.3.39, 11.4.1, 11.4.2, 11.4.3, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.4.12, 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, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.7, 11.10.8, 11.10.9, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.5, 11.11.6, 11.11.7, 11.11.9, 11.11.10, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.18, 11.11.19, 11.12.0, 11.12.1, 11.12.2, 11.12.3, 11.12.4, 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, 11.12.19, 11.12.20, 11.12.21. Closed forest types including rainforest, mature forest and tall woodland (particularly riparian and ecotonal areas), swamp forest (e.g. Melaleuca, Leptospermum); with rainfall >700mm p.a. Nest in canopy of tall, mature eucalypt in dense relatively undisturbed mature (>30 years) forest (tall open forest, tall woodland & closed forest), 8-40m above ground. **DERM 2012** - High habitat values associated with RES 10.5.1 and all land zone 10 RES (where these occur in high condition).

Species	Status	Base Data and Habitat Descriptions
Square-tailed Kite <i>Lophoictinia isura</i>	nt	<p>VMA Essential Habitat Database (Habitat Factors) - DUB REs: 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, 10.4.7, 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, 10.9.2, 10.9.3, 10.9.5, 10.10.1, 10.10.3, 10.10.4, 10.10.5, & 10.10.7.</p> <p>BBB REs: 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, 11.3.6, 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, 11.3.23, 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, 11.4.1, 11.4.2, 11.4.3, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.13, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.4, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.4, 11.10.5, 11.10.6, 11.10.7, 11.10.8, 11.10.9, 11.10.10, 11.10.11, 11.10.12, 11.10.13, 11.11.1, 11.11.3, 11.11.4, 11.11.5, 11.11.6, 11.11.7, 11.11.8, 11.11.9, 11.11.10, 11.11.11, 11.11.13, 11.11.14, 11.11.18, 11.11.19, 11.12.1, 11.12.2, 11.12.3, 11.12.4, 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, 11.12.19, 11.12.20, 11.12.21. Vegetation Community: Open eucalypt forest and woodland (grassy or shrubby and including riparian) (<i>Corymbia citriodora/henryi</i>, <i>Eucalyptus pilularis</i>, ironbark), subtropical rainforest, mallee and heathland: > 500mm rainfall p.a. Nest 12-30m above ground in mature tree (<i>Eucalyptus</i>, <i>Corymbia</i> or <i>Angophora</i> spp.) in or near forest or woodland along or near watercourse. Altitude: Sea level to 500m. Morgan et al. 2002 - REs: 10.3.14, 10.5.1, & 10.5.5. Uncommon in the Desert Uplands and records are all from the north east. DERM 2012 - High habitat values associated with REs 10.5.5, and 10.3.27 (where these occur within or adjacent to significant wetlands), and 10.3.13, 10.3.14 and all land zone 10 REs (where these occur in good condition).</p>
Glossy-black Cuckoo <i>Calyptorhynchus lathamii</i>	v	<p>VMA Essential Habitat Database (Habitat Factors) - BBB REs: 11.1.4, 11.2.1, 11.2.2, 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, 11.3.26, 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, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.16, 11.5.17, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.6, 11.8.1, 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, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.13, 11.9.14, 11.10.1, 11.10.2, 11.10.3, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.19, 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, 11.12.15, 11.12.17, 11.12.19, 11.12.20, 11.12.21, 12.1.1. Lowland and highland eucalypt forest and woodland, including riparian, callitris and brigalow scrub areas, with Casuarina (<i>C. glauca</i>, <i>C. cristata</i>)/Allocasuarina spp. (<i>A. torulosa</i>, <i>A. littoralis</i>). Nest in large vertical hollow (1-2m deep, 25-50cm diameter) up to 28m above ground in tall slightly isolated tree usually near principal food source (<i>Allocasuarina/Casuarina</i>). DERM 2012 - High habitat values associated with REs 10.3.13 and 10.3.14 (where these occur within or adjacent to significant wetlands).</p>

Base Data and Habitat Descriptions		
Species	Status	
Black-chinned Honeyeater <i>Meliphreptus gularis</i>	nt	<p>VMA Essential Habitat Database (Habitat Factors) - DUB REs: 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, 10.3.26, 10.3.27, 10.3.28, 10.3.29, 10.3.30, 10.3.31, 10.4.3, 10.4.7, 10.5.1, 10.5.2, 10.5.4, 10.5.5, 10.5.6, 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, 10.10.2, 10.10.3, 10.10.4, 10.10.5, & 10.10.7. BBB REs: 11.1.4, 11.2.1, 11.2.2, 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, 11.3.26, 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, 11.4.5, 11.4.7, 11.4.8, 11.4.9, 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, 11.5.11, 11.5.12, 11.5.13, 11.5.14, 11.5.16, 11.5.17, 11.5.18, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.8.1, 11.8.2, 11.8.4, 11.8.5, 11.8.7, 11.8.8, 11.8.9, 11.8.11, 11.8.12, 11.8.14, 11.8.15, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.9.11, 11.9.13, 11.9.14, 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, 11.11.13, 11.11.14, 11.11.15, 11.11.16, 11.11.19, 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, 11.12.16, 11.12.17, 11.12.18, 11.12.19, 11.12.20, 11.12.21. Vegetation community: Mostly in canopy of dry eucalypt forest and woodland (especially bloodwood – <i>Corymbia citriodora</i>, ironbark – <i>Eucalyptus sideroxylon</i> and box – <i>E. moluccana</i>, <i>E. albens</i> associations on western slopes, especially where rainfall 400-700mm pa), also callitris and melaleuca woodland, riparian eucalypts (<i>E. tereticornis</i>, <i>E. camaldulensis</i>) and acacia scrub; in northern areas in tall stringybark & bloodwood woodlands; grassy open <i>E. melanophloia</i> and shrubby open <i>E. similis</i> woodlands. Nest in outermost and topmost foliage of tree (usually eucalypt); 1-25m above ground. Altitude: 100-500m. Morgan et al. 2002 - REs: 10.3.8, 10.5.1, & 10.7.11. The Desert Uplands is a broad area of intergradation between the southern rare/near threatened sub-species and the northern common sub-species. It is not clear which is present in the bioregion. DERM 2012 - High habitat values associated with REs 10.5.5 and 10.3.27 (where these occur within or adjacent to significant wetlands), and all land zone 10 REs (where these occur in good condition).</p>



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