

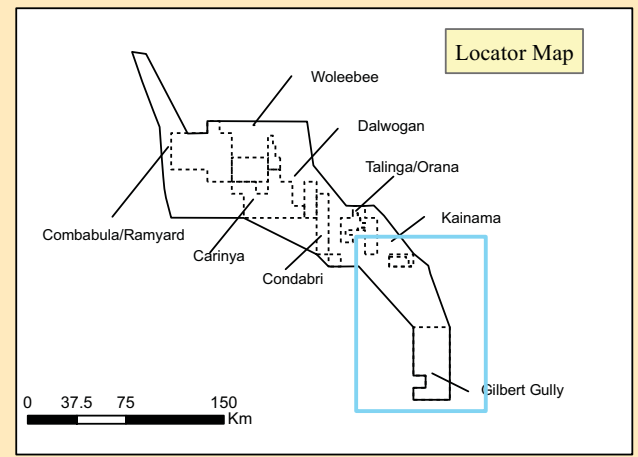
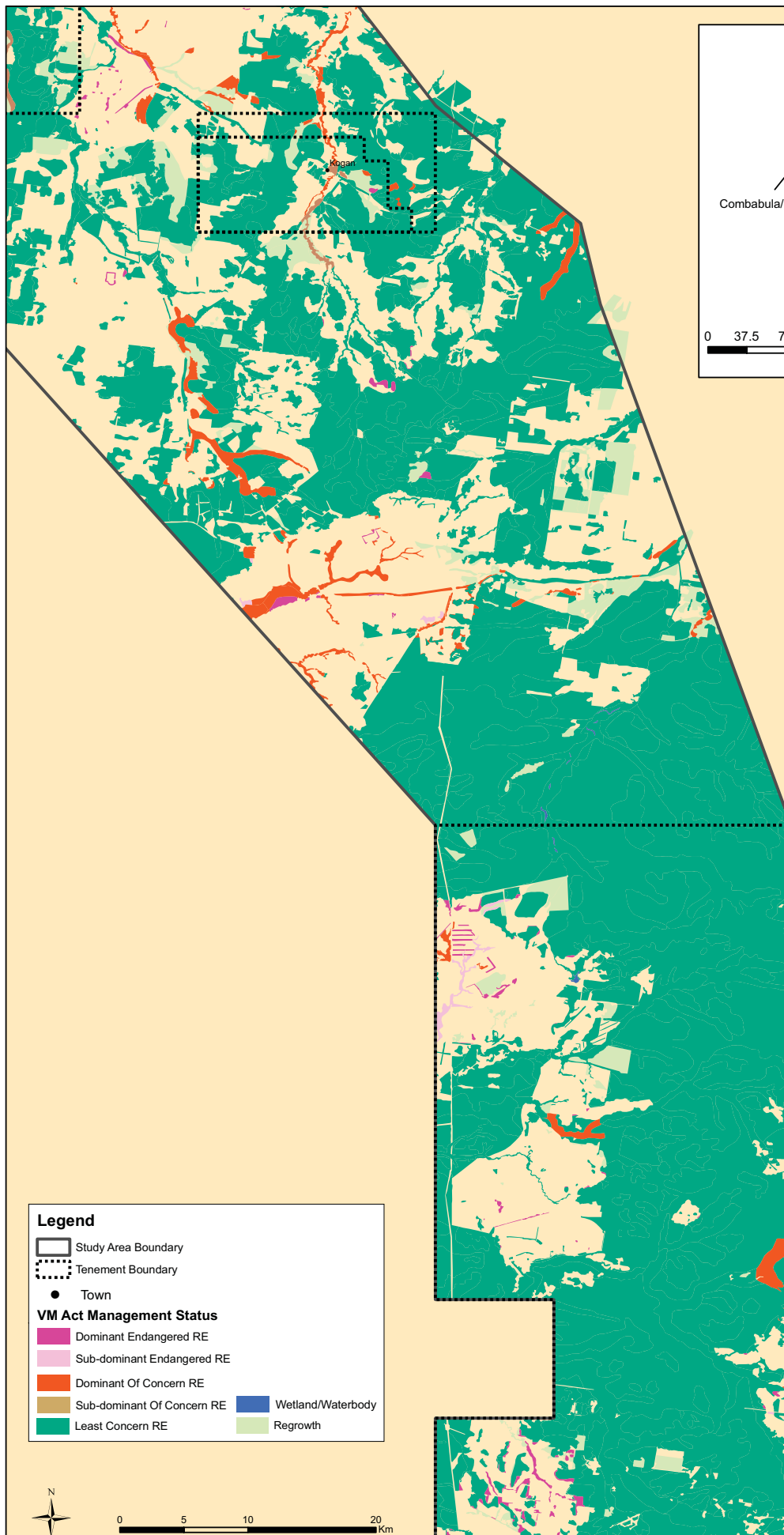
# **APPENDIX I**

## **REFINED VEGETATION MAPPING FROM THE CURRENT ASSESSMENT**

### **TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT REPORT – GAS FIELDS COMPONENT AUSTRALIA PACIFIC LNG PROJECT EIS**

#### ***Table of contents***

Figure I.1	Refined Vegetation Mapping - VM Act Status (incorporating Kainama and Gilbert Gully tenements)
Figure I.2	Refined Vegetation Mapping - VM Act Status (incorporating Talinga, Orana, Condabri and Dalwogan tenements)
Figure I.3	Refined Vegetation Mapping - VM Act Status (incorporating Carinya, Woleebee and Ramyard tenements)
Figure I.4	Refined Vegetation Mapping - VM Act Status (incorporating Combabula and Ramyard tenements)
Figure I.5	Refined Vegetation Mapping - Biodiversity Status (incorporating Kainama and Gilbert Gully tenements)
Figure I.6	Refined Vegetation Mapping - Biodiversity Status (incorporating Talinga, Orana, Condabri and Dalwogan tenements)
Figure I.7	Refined Vegetation Mapping - Biodiversity Status (incorporating Carinya, Woleebee and Ramyard tenements)
Figure I.8	Refined Vegetation Mapping - Biodiversity Status (incorporating Combabula and Ramyard tenements)
Figure I.9	Refined Vegetation Mapping – EPBC Act Status (incorporating Kainama and Gilbert Gully tenements)
Figure I.10	Refined Vegetation Mapping - EPBC Act Status (incorporating Talinga, Orana, Condabri and Dalwogan tenements)
Figure I.11	Refined Vegetation Mapping – EPBC Act Status (incorporating Carinya, Woleebee and Ramyard tenements)
Figure I.12	Refined Vegetation Mapping – EPBC Act Status (incorporating Combabula and Ramyard tenements)



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

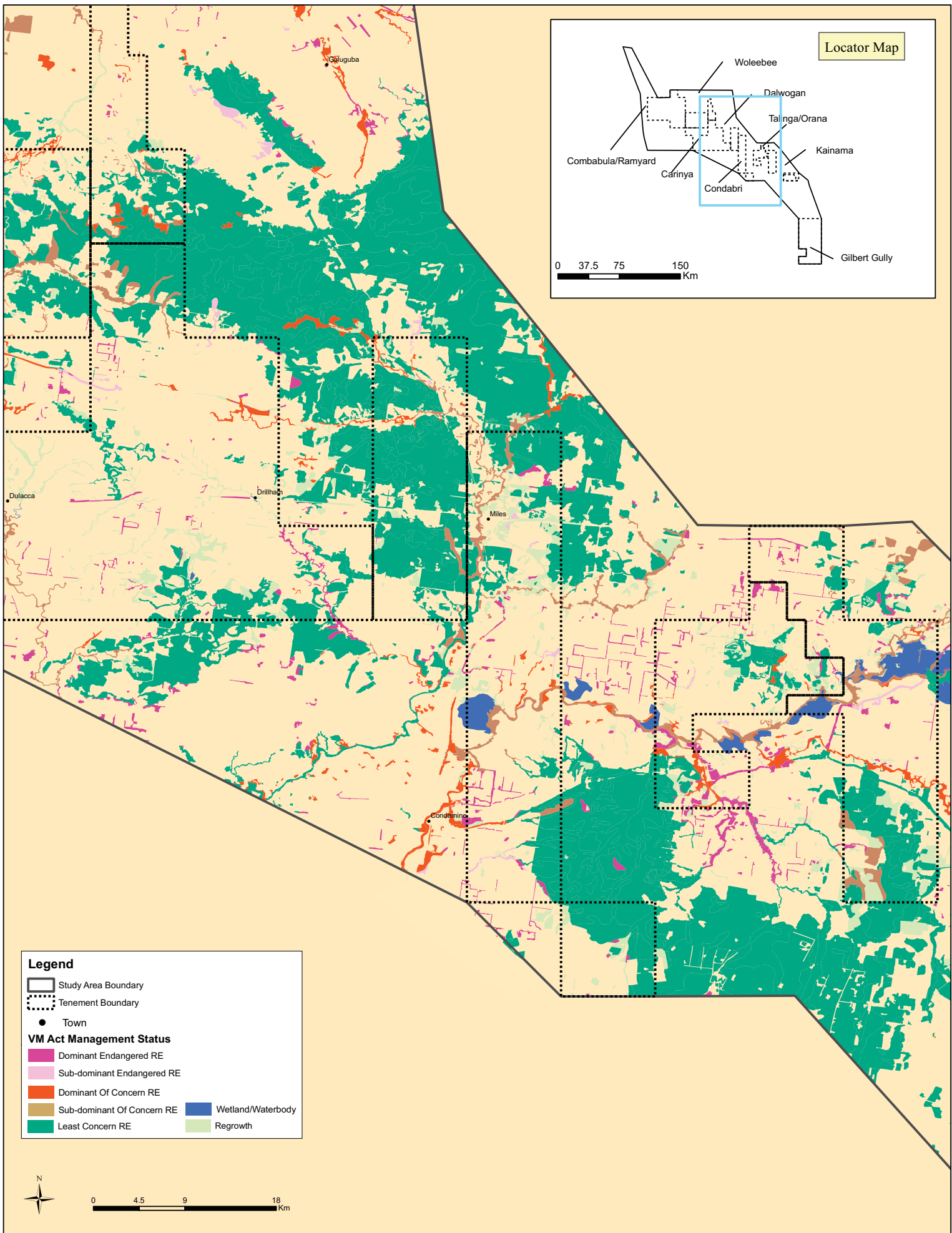
© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



**Figure I.1**

Refined Vegetation  
Mapping (VM Act Status)

Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



## Figure I.2

### Refined Vegetation Mapping (VM Act Status)

Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS

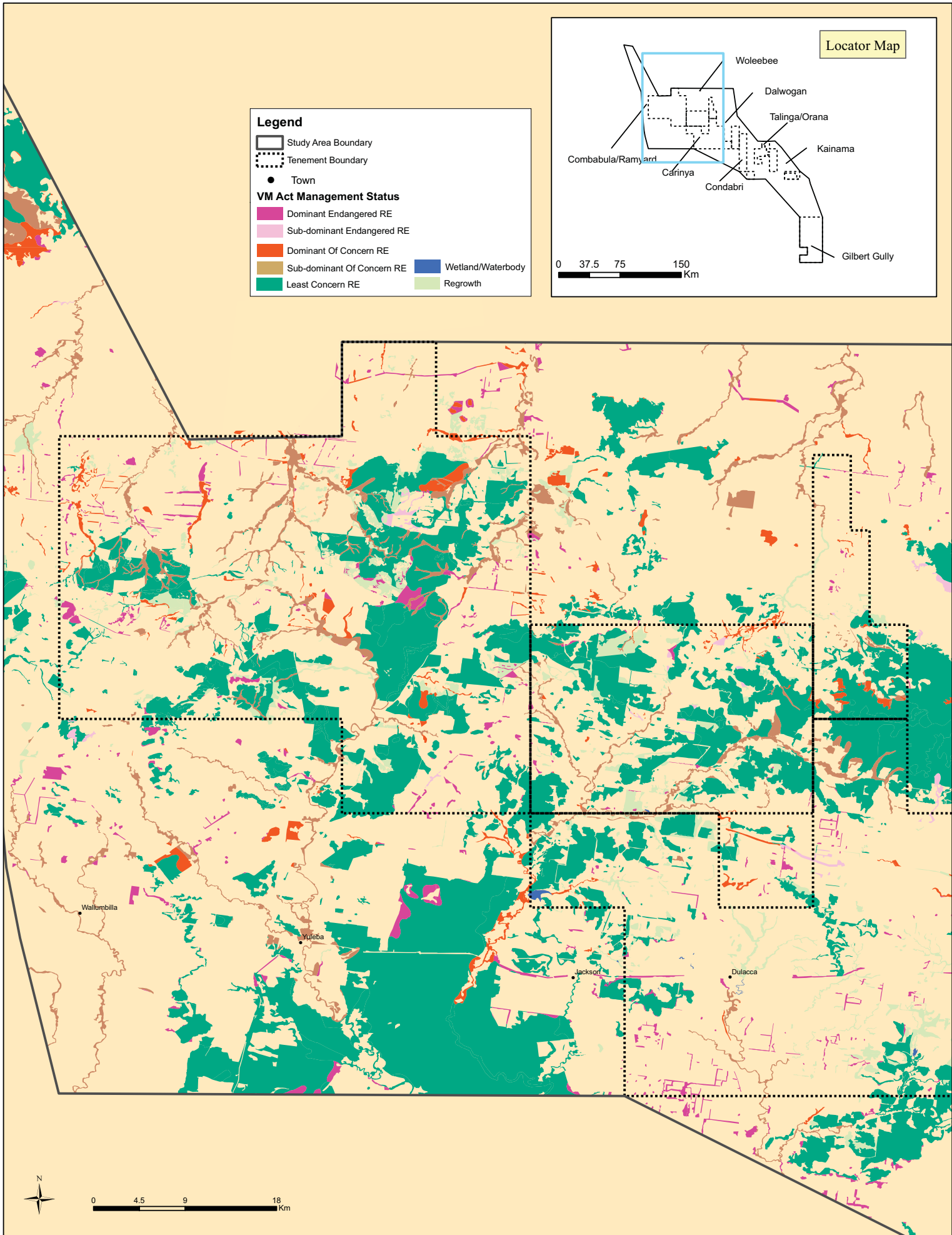


Figure I.3.

Refined Vegetation Mapping (VM Act Status)  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

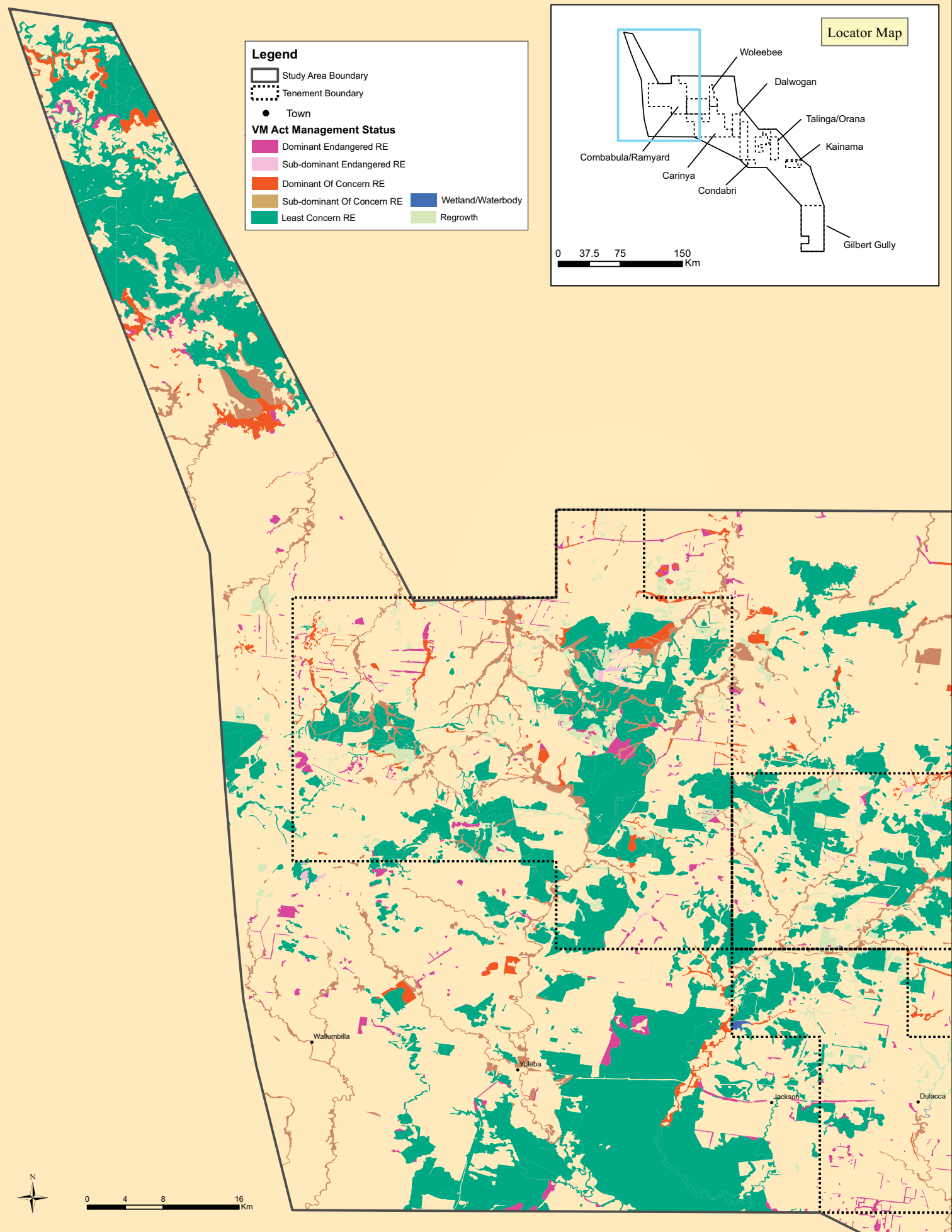
Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd

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







Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

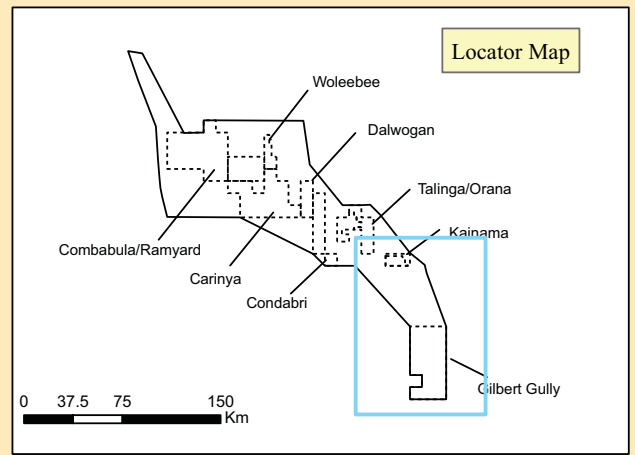
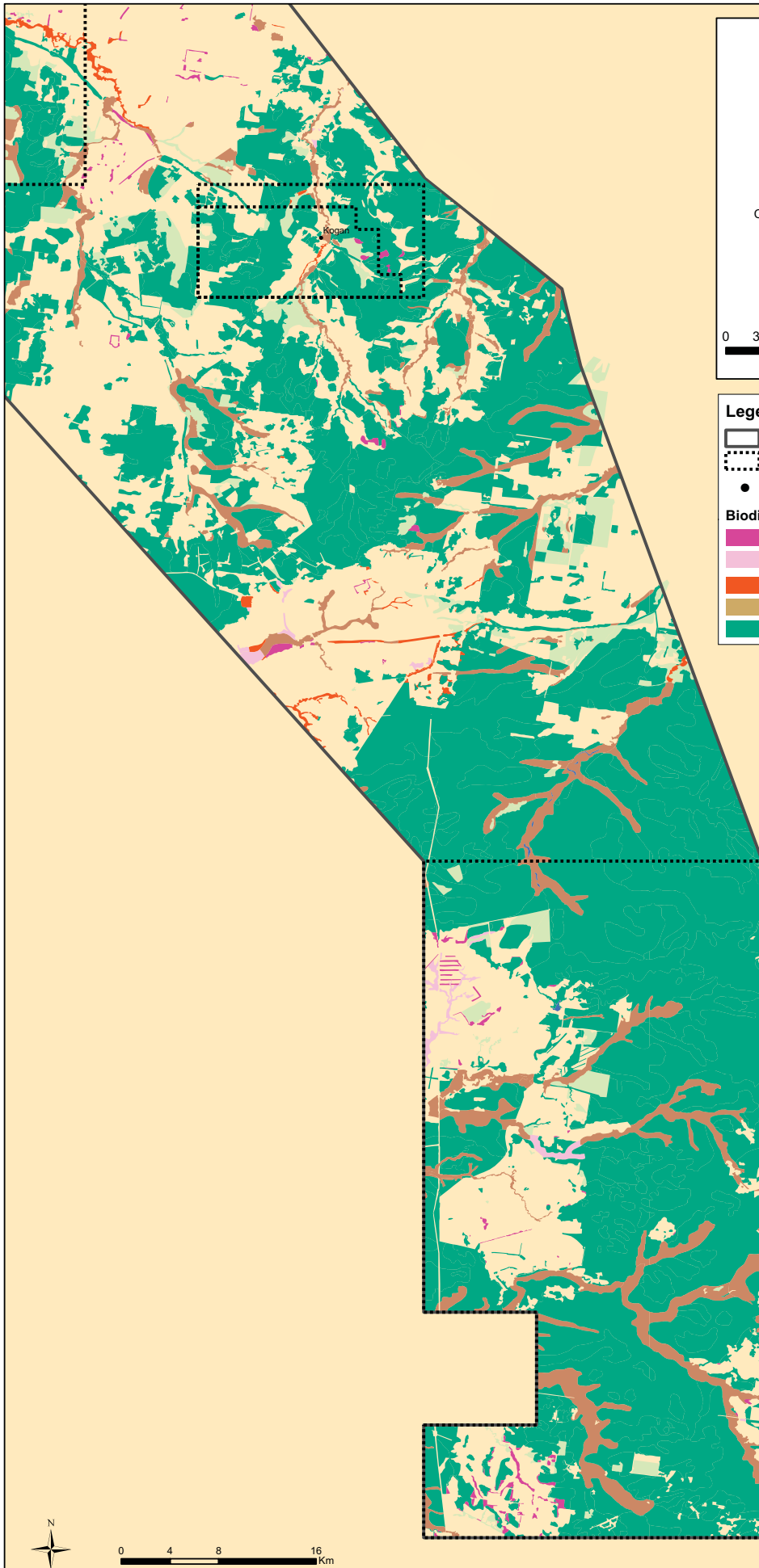
© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



**Figure I.4**

**Refined Vegetation Mapping (VM Act Status)**

**Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS**



#### Legend

- Study Area Boundary
- Tenement Boundary
- Town

#### Biodiversity Status

- Dominant Endangered RE
- Sub-dominant Endangered RE
- Dominant Of Concern RE
- Sub-dominant Of Concern RE
- No Concern at Present RE
- Wetland/Waterbody
- Regrowth

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

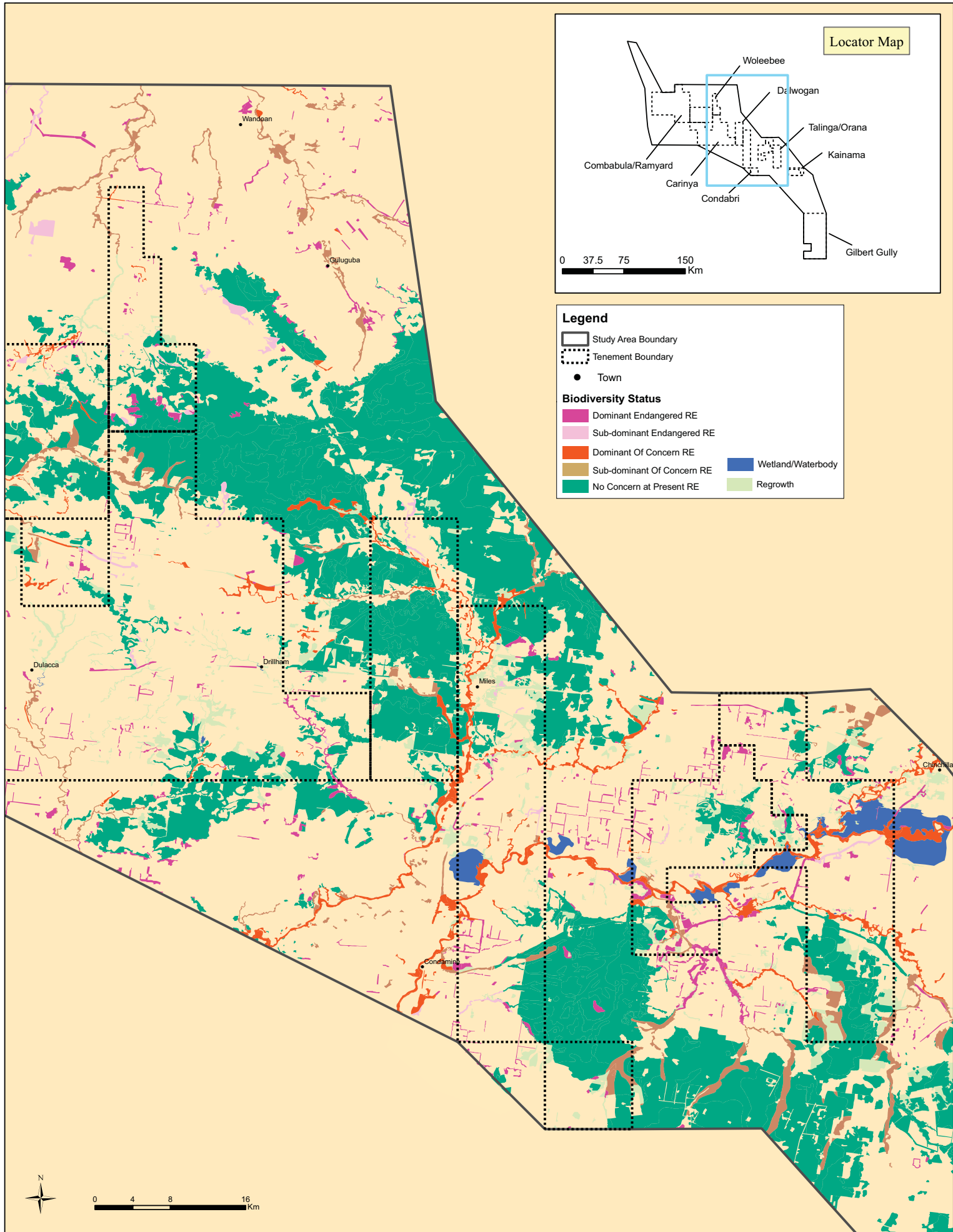
Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



## Figure I.5

Refined Vegetation Mapping (Biodiversity Status)  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

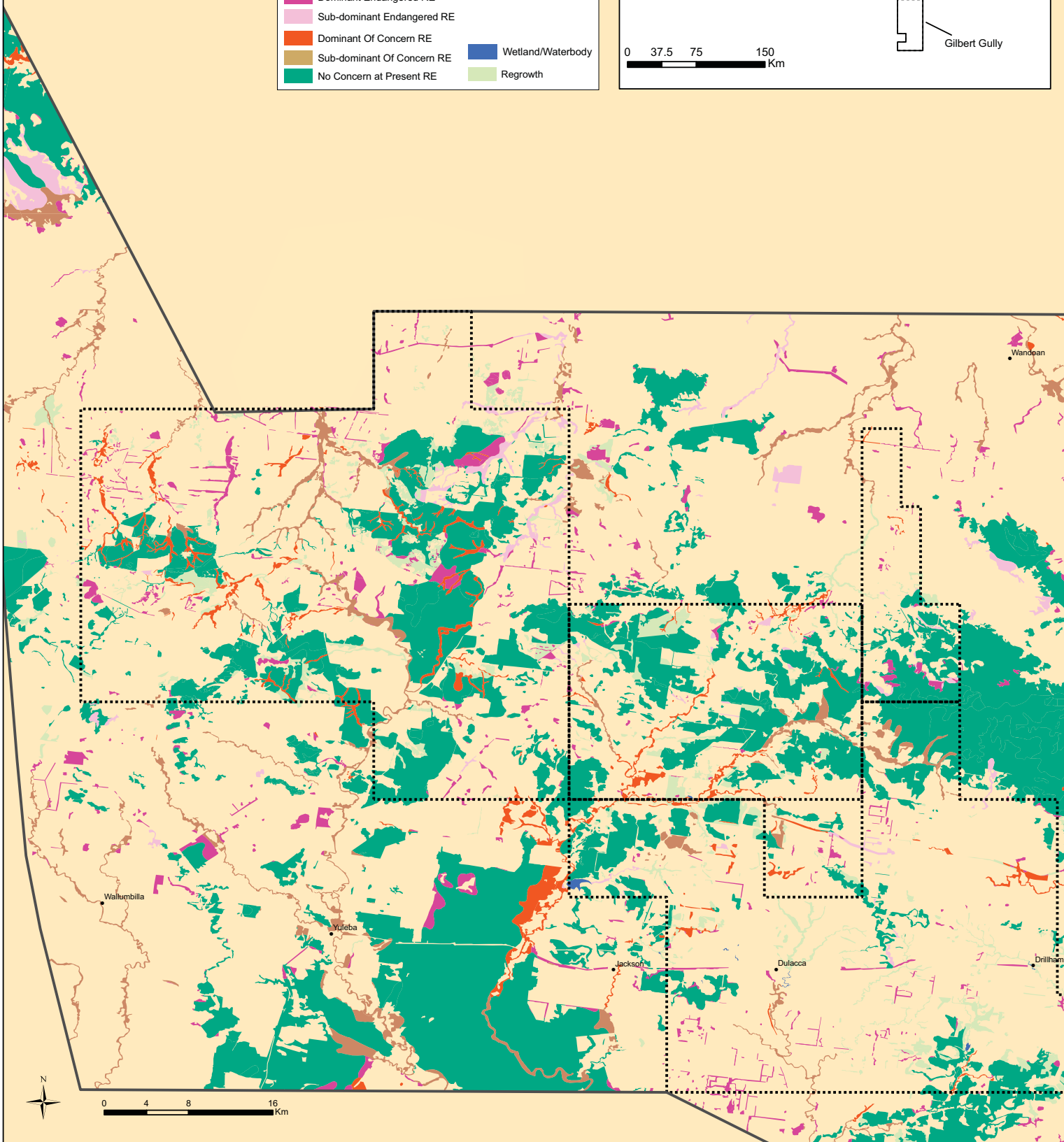
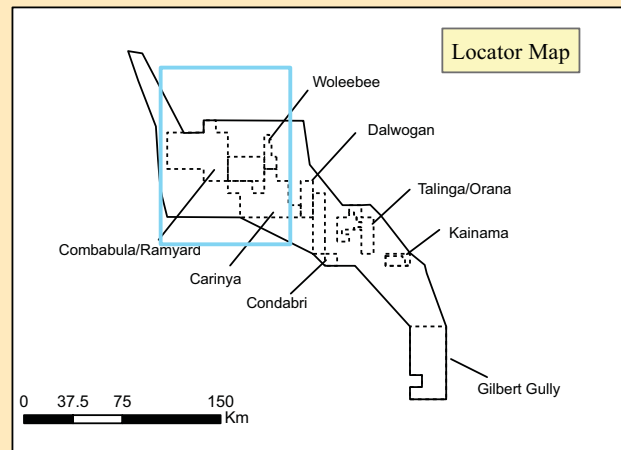
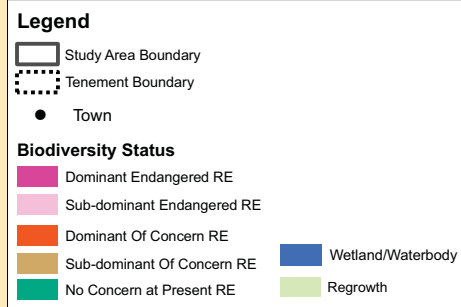
Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



**Figure I.6**

**Refined Vegetation Mapping (Biodiversity Status)**  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

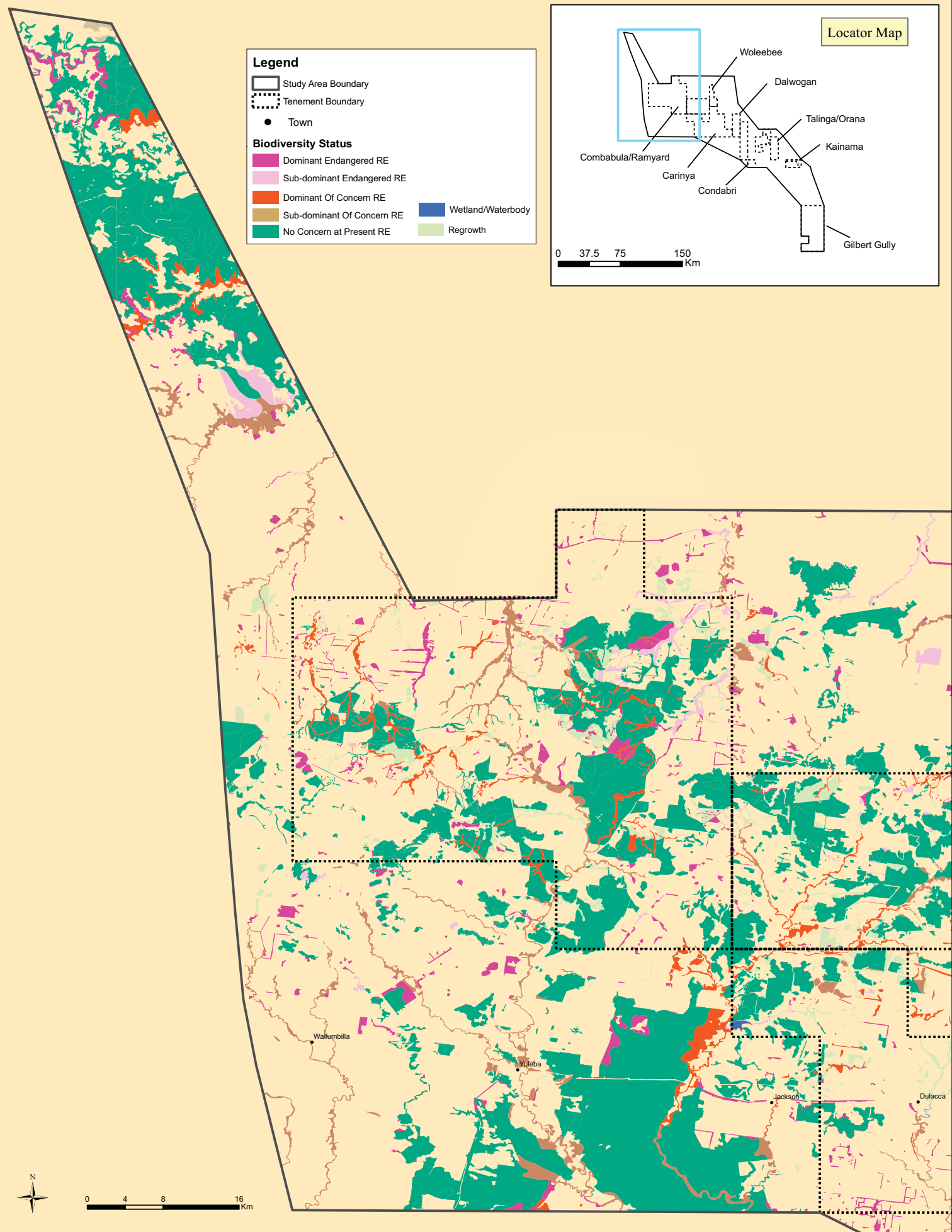
Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



**Figure I.7**  
Refined Vegetation  
Mapping (Biodiversity Status)  
Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS





Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd

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



## Figure I.8

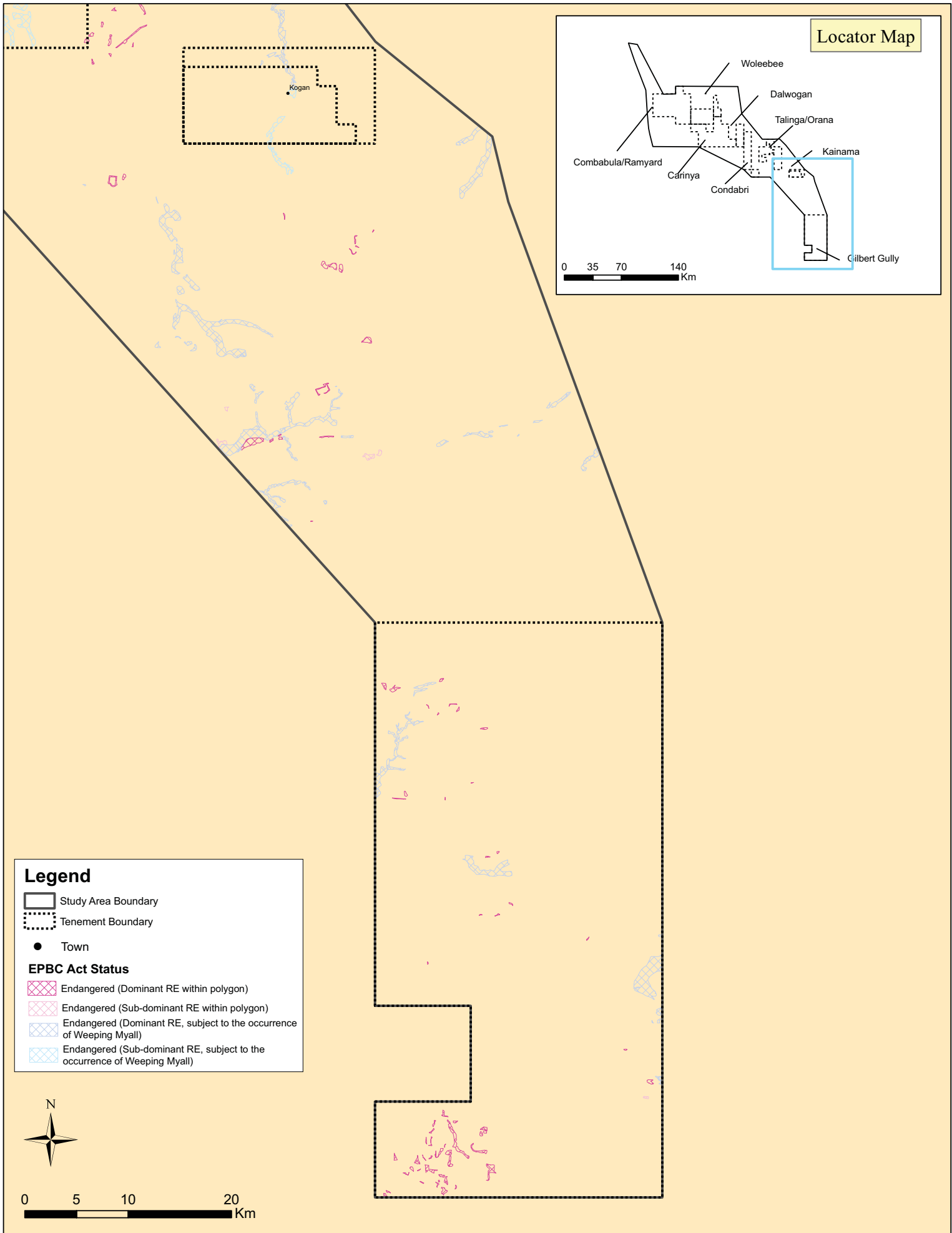
### Refined Vegetation

### Mapping (Biodiversity Status)

### Terrestrial Ecology and Impact

### Assessment Report (Gas Fields Component) -

### Australia Pacific LNG Project EIS



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

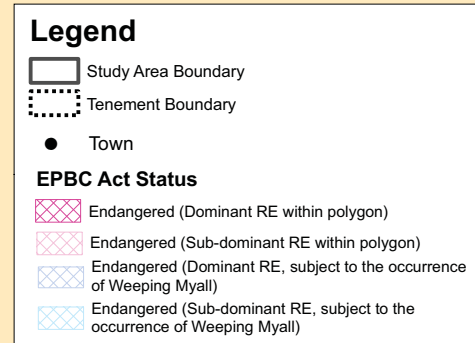
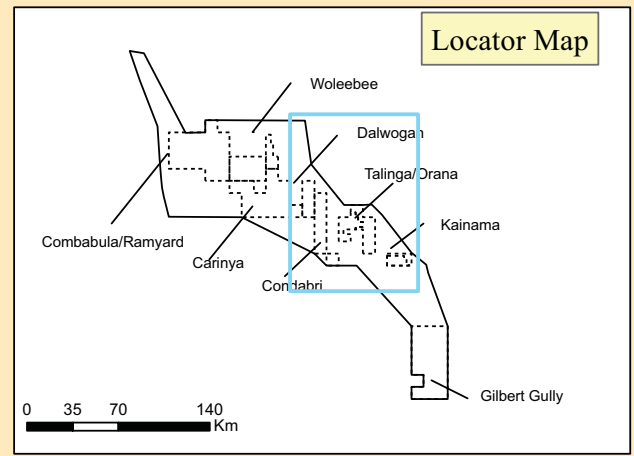
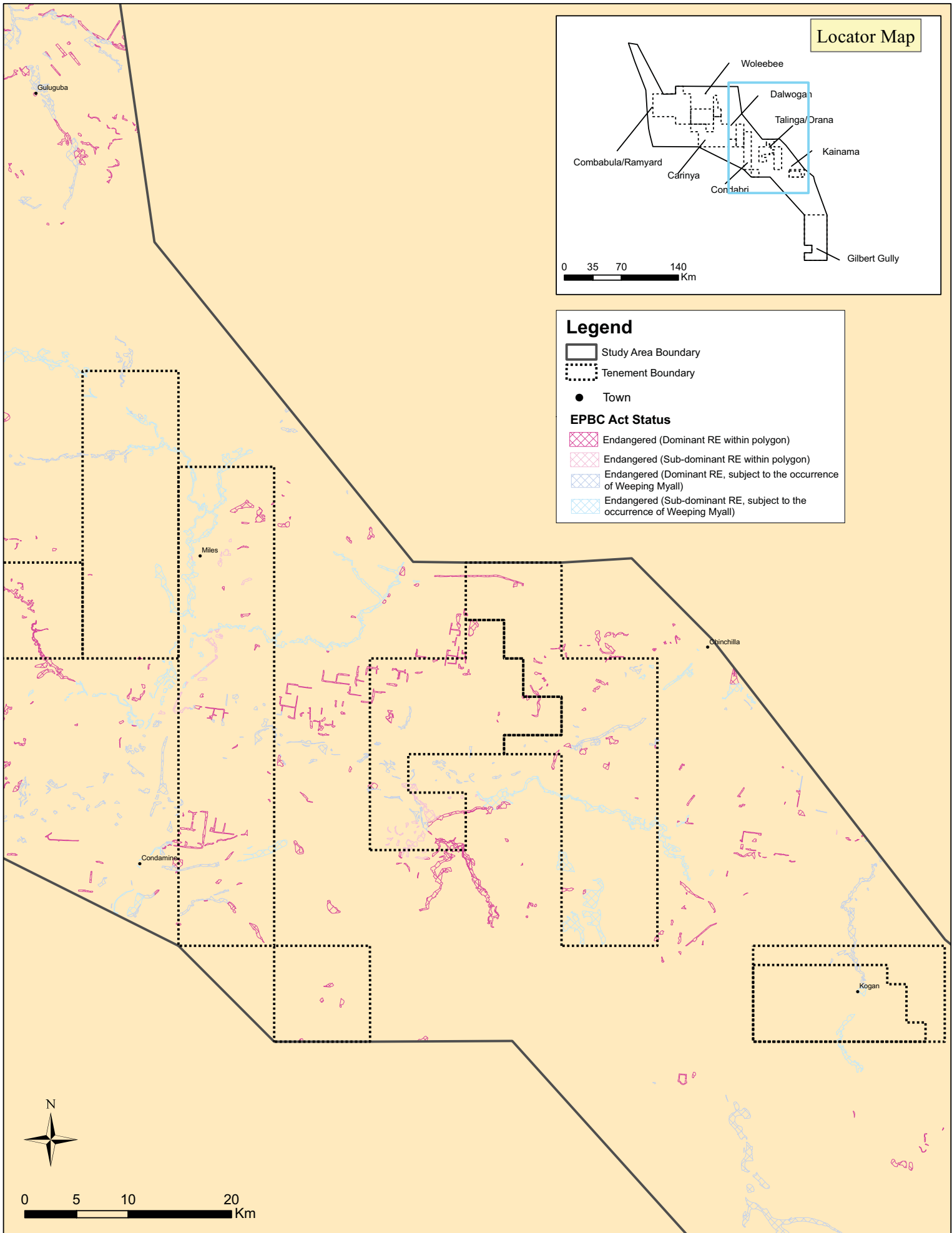
Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed June 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



**Figure I.9**

Refined Vegetation Mapping (EPBC Act Status)  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed June 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.






**Figure I.10**





Refined Vegetation  
Mapping (EPBC Act Status)

Terrestrial Ecology and Impact  
Assessment Report (Gas Fields Component) -  
Australia Pacific LNG Project EIS

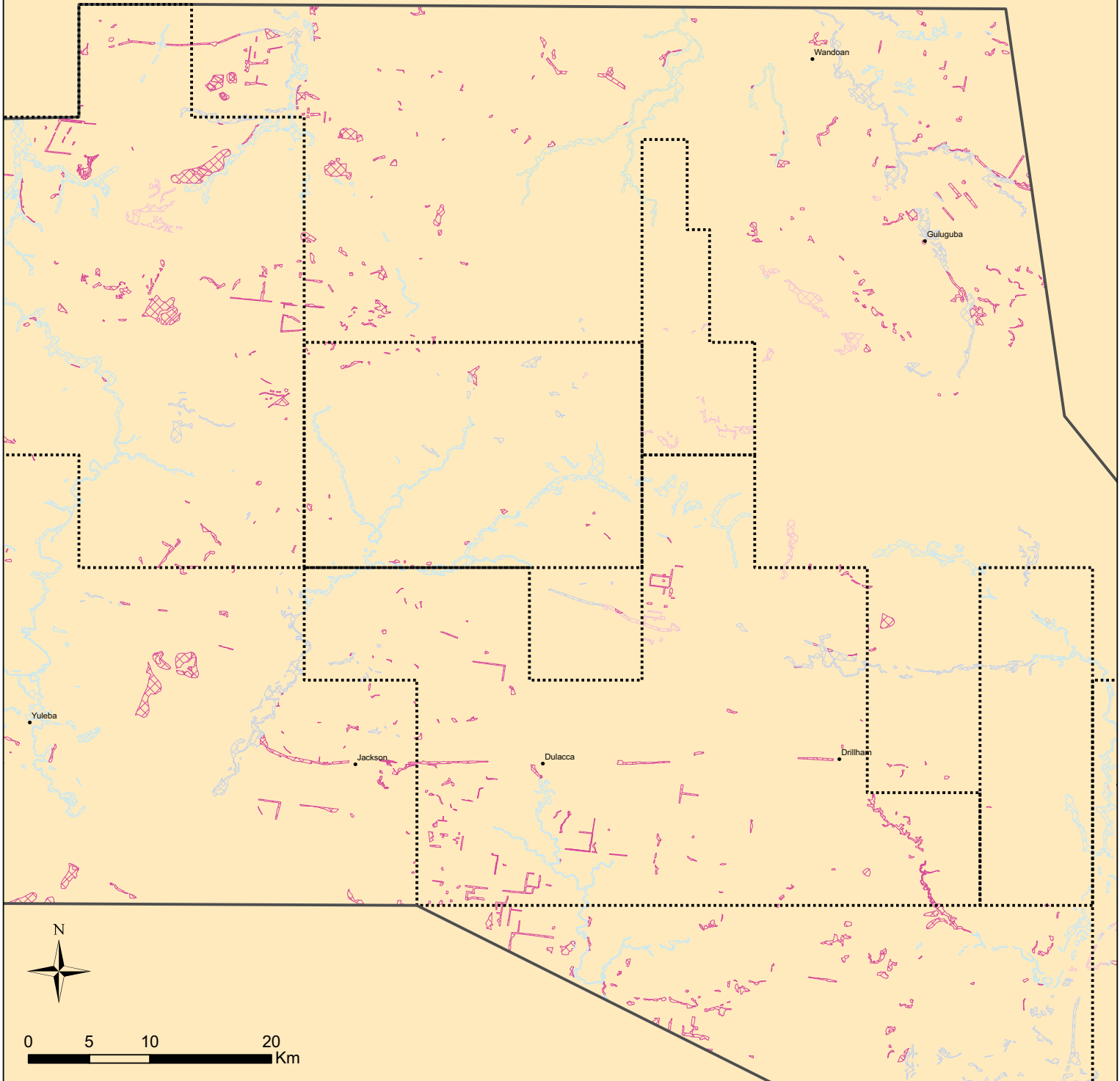
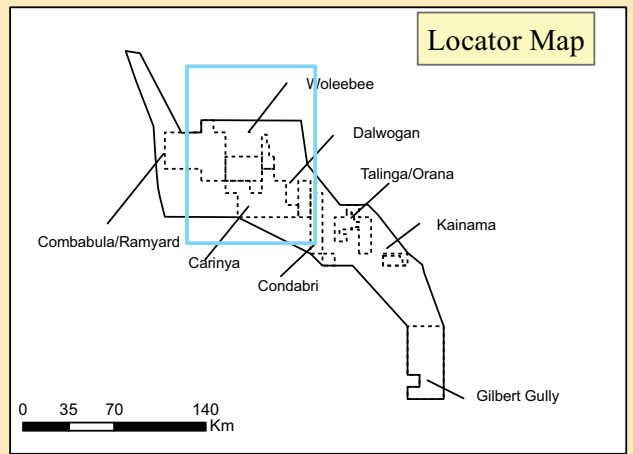
## Legend

-  Study Area Boundary
-  Tenement Boundary
-  Town

### EPBC Act Status

-  Endangered (Dominant RE within polygon)
-  Endangered (Sub-dominant RE within polygon)
-  Endangered (Dominant RE, subject to the occurrence of Weeping Myall)
-  Endangered (Sub-dominant RE, subject to the occurrence of Weeping Myall)

## Locator Map



Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed June 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

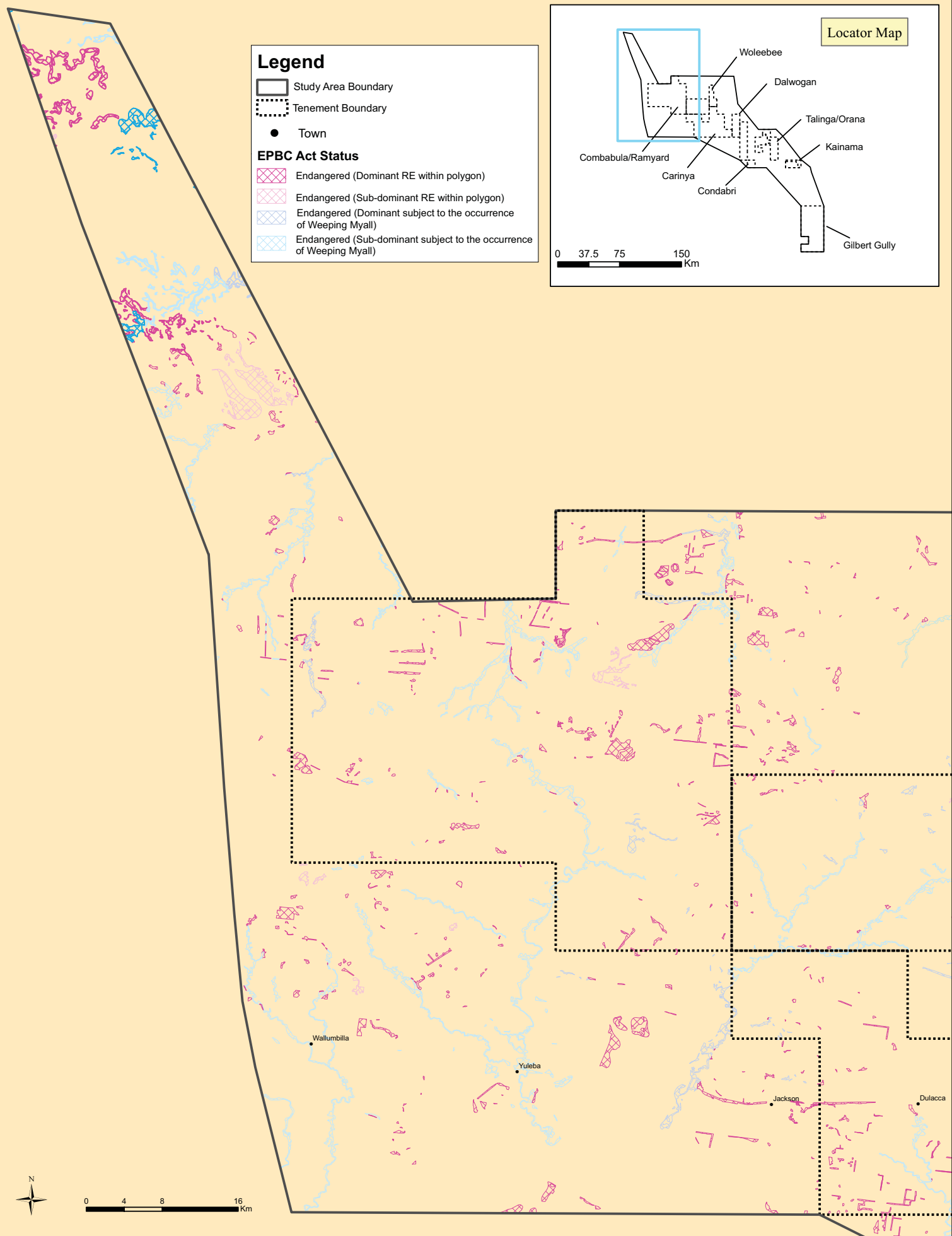
© Biodiversity Assessment and Management Pty Ltd  
While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation liability in negligence) for all expenses, losses, damages (including indirect consequential damage) and costs which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



## Figure I.11

Refined Vegetation Mapping (EPBC Act Status)  
Terrestrial Ecology and Impact Assessment Report (Gas Fields Component) - Australia Pacific LNG Project EIS





**Legend**

Study Area Boundary

Tenement Boundary

Town

**EPBC Act Status**

Endangered (Dominant RE within polygon)

Endangered (Sub-dominant RE within polygon)

Endangered (Dominant subject to the occurrence of Weeping Myall)

Endangered (Sub-dominant subject to the occurrence of Weeping Myall)

**Locator Map**

Woleebee

Dalwogan

Talinga/Orana

Kainama

Gilbert Gully

Combabula/Ramyard

Carinya

Condabri

0
37.5
75
150

Km

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd

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



**Figure I.12**  
 Refined Vegetation  
 Mapping (EPBC Act Status)  
 Terrestrial Ecology and Impact  
 Assessment Report (Gas Fields Component) -  
 Australia Pacific LNG Project EIS

**Appendix J:**  
**Likelihood of Occurrence of Terrestrial Flora and Fauna**  
**Species of Special Conservation Significance within the**  
**Study Area**

## **APPENDIX J**

### **LIKELIHOOD OF OCCURRENCE OF TERRESTRIAL FLORA AND FAUNA SPECIES OF SPECIAL CONSERVATION SIGNIFICANCE WITHIN THE STUDY AREA**

#### **TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT REPORT – GAS FIELDS COMPONENT AUSTRALIA PACIFIC LNG PROJECT EIS**

##### ***Table of Contents***

Table J.1	Likelihood of Occurrence of Terrestrial Flora Species of Special Conservation Significance within the Study Area
Table J.2	Likelihood of Occurrence of Terrestrial Fauna Species of Special Conservation Significance within the Study Area

Table J.1. Likelihood of occurrence of terrestrial flora species of special conservation significance within the Study Area

Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2</sup>		Habitat Preference <sup>3</sup>	Known Distribution <sup>3</sup> and Likelihood of Occurrence
			DERM	EPBC	CE	EPBC Act	NC Act	BAMM		
Acanthaceae	<i>Xerothermella herbacea</i>	Herbaceous Xerothermella		X		E	E		Found in Brigalow dominated communities in shaded situations, often in leaf litter and in association with gillgals, on heavy, grey to dark brown clay soils.	Restricted to the Chinchilla – Goondiwindi region of southern Queensland. <b>Possibly occurs within Study Area</b>
Apocynaceae	<i>Tylophora linearis</i>	Slender Tylophora		X		E	E		Found in dry scrublands, open forests and woodlands in association with Broombush <i>Melaleuca uncinata</i> , Broad-leaved Ironbark, Red Ironbark, <i>Eucalyptus sideroxylon</i> , White Box <i>E. albens</i> , Black Cypress Pine <i>Callitris endlicheri</i> , White Cypress Pine, Bullock <i>Allocasuarina leuhmannii</i> , Hakea <i>Acacia hakeoides</i> , Striped Wattle <i>A. lineata</i> , Myoporums ( <i>Myoporium</i> spp.) and She-oaks ( <i>Casuarina</i> spp.) at low altitudes and on sedimentary flats.	Restricted to northern and central western slopes of New South Wales and near Glenmorgan in the western Darling Downs district in Queensland. <b>Possibly occurs within Study Area.</b>
Asteraceae	<i>Picris barbarorum</i>	Plains Picris	X				C	X	Occurs on river banks and floodplains – alluvial soils.	Uncommon in New South Wales, Victoria and Queensland. <b>Possibly occurs within Study Area.</b>
Asteraceae	<i>Rhaphaniticum australe</i>	Austral Comflower		X		V	V		Found in eucalypt open forests with grassy understorey in association with Narrow-leaved Red Ironbark, Mountain Coolibah <i>Eucalyptus orgadophila</i> , Poplar Box, Forest Red Gum, Silver-leaved Ironbark, Broad-leaved Apple <i>Angophora subvelutina</i> , Rough-barked Apple, Spear Thistle <i>Cirsium vulgare</i> , Rhodes Grass <i>Chloris gayana</i> , Queensland Bluegrass <i>Dichanthium sericeum</i> and Kangaroo Grass <i>Themeda triandra</i> , in black clay soils, on roadsides and road reserves and up to 480m altitude.	Restricted from Mount Moffatt to Gatton in southern Queensland and historically known to extend through New South Wales and Victoria. <b>Not likely to occur within Study Area.</b>
Asteraceae	<i>Rutidosis crispata</i>		X				R		Found in open forests dominated by Narrow-leaved White Mahogany <i>Eucalyptus tenuipes</i> , Brown Bloodwood and the Ironbark <i>E. suffulgens</i> , with Spinifex ( <i>Triodia</i> spp.) understorey, on ridge tops and in shallow sandy soils overlying sandstone.	Restricted to the Glenmoral Gap in the Dawson Range in central Queensland. <b>Not likely to occur within Study Area.</b>
Asteraceae	<i>Rutidosis lanata</i>	Red-soil Woolly Winklewort	X		X		E		Found in Poplar Box - Belah dominated forests, ironbark and Currawong <i>Acacia sparsiflora</i> forests, box-ironwood forests and eucalypt forests in red-brown gravelly sands, grey clays, red-brown clay and sandy loams, on flat land and stony red ridges and at 280 – 320m altitude.	Restricted to the Darling Downs district of southern Queensland. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Bythneriaceae	<i>Commersonia argentea</i>	Commersonia		X		V	C		Euclalypt forests on stony ridges.	Restricted to central and southern Queensland from near Injune west to Tambo. <b>Not likely to occur within Study Area.</b>
Caesalpinaceae	<i>Senna acclimis</i>	Rainforest Cassia	X				R		Found in rainforest margins in association with Burdekin Plum <i>Pleogynium limorense</i> and open forests in association with Flooded Gum <i>Eucalyptus grandis</i> , Turpentine <i>Syncarpia glomulifera</i> and Red Ash <i>Alphitonia excelsa</i> , in soils derived from basalt and metamorphic rocks and at altitudes of 100 - 660m.	Restricted to coastal regions of central Queensland and central New South Wales. Known from Gurulmundi State Forest. <b>Known to occur within Study Area.</b>
Celastraceae	<i>Denhamia parvifolia</i>	Small-leaved Denhamia	X	X		V	V		Found in semi-evergreen vine thickets, vine scrubs and Brigalow scrub communities in association with Shrub Persimmon <i>Diospyros humilis</i> , Crow's Ash <i>Flindersia australis</i> , Wilga <i>Geijera parviflora</i> , Crow's Apple <i>Owenia venosa</i> and Python Tree <i>Austrorhynchus bidwillii</i> in fertile, red-brown, sandy, clay loams on hillslopes and crests of variable aspect and at 160 – 560m altitude. Also recorded in Narrow-leaved Red Ironbark forests.	Restricted to the greater Chinchilla area in south-eastern Queensland. Known to occur in vine thicket at Allies Creek Area (Craig Eddie pers. comm.). <b>Not likely to occur within Study Area.</b>
Cupressaceae	<i>Callitris baileyi</i>	Bailey's Cypress Pine	X				R		Found in open grassy eucalypt forest on shallow, often clayey soils in rocky areas.	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. Representative populations recorded at Kinbombi Fall; near Mount Kiangarow in the Bunya Mountains; and Sandilands, east of Tabulam. <b>Not likely to occur within Study Area.</b>
Cyperaceae	<i>Cyperus clarus</i>	Bright Flat-sedge	X		X		V		Found in grasslands and open woodlands on heavy basalt-derived soils.	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known from Palardo (west of Miles) within the Carinya tenement (Old Herbarium record). <b>Known to occur within Study Area.</b>
Cyperaceae	<i>Eleocharis blakeana</i>	Blake's Spikerush	X				R		Found in ephemeral wet habitats in melon hole country in Brigalow and Belah scrub communities on plains and low undulating country, and in small depressions along drainage lines in Poplar Box and Moreton Bay Ash <i>Corymbia tessellaris</i> open forests and woodlands. Also recorded along roadside channels and in paddocks.	Restricted to southern Queensland and northern New South Wales. <b>Known to occur within Study Area.</b>
Cyperaceae	<i>Fimbristylis vagans</i>	Wandering Fringe-rush	X				R		Swamps, wetlands and areas of poor drainage.	Rare within the Western Darling Downs. <b>Possibly</b>



Family	Species Name	Common Name	Source <sup>1</sup>			Management Status <sup>2</sup>			Habitat Preference <sup>3</sup>	Known Distribution <sup>3</sup> and Likelihood of Occurrence
			DERM	EPBC	CE	EPBC Act	NC Act	BAMM		
Eriocaulaceae	<i>Eriocaulon carsonii</i>	Salt Pipewort	X	X			E		Found in active or flowing artesian mound springs or the margins of the Great Artesian Basin and on fen soils.	occurs within Study Area.
Fabaceae	<i>Swainsona murrayana</i>	Slender Darling-pea		X		V	V		Found in a variety of vegetation communities from saltbush to eucalypt communities in depressions on heavy soils. Collection site in Queensland is bluegrass/mitchell grass grassland.	Restricted to Queensland and New South Wales. Only record in Queensland is from the Surat region. <b>Not likely to occur within Study Area.</b>
Haloragaceae	<i>Gonocarpus urceolatus</i>	Gonocarpus	X		X		V		Tall Dusky-leaved Ironbark woodland on lateritic duricrust (RE11.7.7); Gum-topped Ironbark woodland on lateritic duricrust (RE11.7.4); Narrow-leaved Red Ironbark woodland on sand plains. Key REs in Study Area are 11.7.5 and 11.7.2.	Restricted to the Chinchilla and Emerald districts of south-eastern and central Queensland. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Haloragaceae	<i>Halobragis exalata</i> ssp. <i>velutina</i>	Tall Velvet Sea-berry					V		Found in rainforests and rainforest margins and adjacent grasslands and open grassy woodlands in association with Broad-leaved Apple, Forest Red Gum, Green Wattle <i>Acacia irrorata</i> and Dwarf Scaillcap <i>Scutellaria humilis</i> , in damp places near watercourses and on steep rocky slopes, above 500m altitude.	Restricted to coastal regions of south-eastern Queensland and north-eastern New South Wales, although known from the Camarvon Range. <b>Not likely to occur within Study Area.</b>
Lamiaceae	<i>Prostanthera</i> sp. <i>Dunmore</i>	Dunmore Mint-bush	X	X		V	V		Found in <i>Eucalyptus</i> - <i>Callitris</i> woodlands in shallow sandy soils and eucalypt woodlands on hard sandstone ridge tops	Restricted to near Millmerran in south-east Queensland. <b>Possibly occurs within Study Area.</b>
Lamiaceae	<i>Westringia parvifolia</i>	Small-leaved Westringia		X		V	V		Found in mallee woodlands and forests in association with Baker's Mallee <i>Eucalyptus bakeri</i> , Green Mallee <i>E. viridis</i> and Spinifexes, in sandy and stony soils.	Restricted to a small area near Yelarbon and Ingleswood in south-eastern Queensland. <b>Not likely to occur within Study Area.</b>
Mimosaceae	<i>Acacia calantra</i>	Cracow Wattle	X				R		Found in eucalypt open forests and acacia woodlands with a dense understorey in sands, loams and light clays on sandstone ridges, rocky hillsides and shallow valleys.	Restricted to the Dawson River Basin near Cracow in southern Queensland. <b>Not likely to occur within Study Area.</b>
Mimosaceae	<i>Acacia chinchillensis</i>	Chinchilla Wattle	X	X	X	V	NT		Found in open forests dominated by Narrow-leaved Red Ironbark, Smooth-barked Apple and Narrow-leaved Box and in association with Bullock, Black Cypress Pine, White Cypress Pine, White Feather Honey-myrtle <i>Melaleuca decora</i> , the Wattle - <i>Acacia crassa</i> , Crowded-leaf Wattle <i>A. conferta</i> , Mueller's Wattle <i>A. muelleriana</i> , Urn-heath <i>Mellichrus urceolatus</i> and Prickly Mirbella <i>Mirbella pungens</i> , in deep loamy to sandy loam soils often with poor drainage and low nutrient levels, on gently undulating flat plains at 340 – 380m altitude. Also recorded in Silver-leaved Ironbark – Coastal Cypress Pine <i>C. columellaris</i> – She-oak ( <i>Casuarina</i> spp.) woodlands.	Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Mimosaceae	<i>Acacia curranii</i>	Curly-barked Wattle	X	X	X	V	V		Found in dry sclerophyll forests and semi-arid woodlands on rocky outcrops of isolated hills and ranges on skeletal soils. Gurulmundi populations are just to the immediate east of the Study Area (Craig Eddie pers. comm.).	Restricted to Gurulmundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. <b>Possibly occurs within Study Area.</b>
Mimosaceae	<i>Acacia grandifolia</i>			X		V	C		The species grows on hilly terrain of varying aspects and slope, on hillcrests, in gullies on plains. It occurs in ironbark gum and Lemon-scented Spotted Gum forests and woodlands. The most frequently recorded associated tree species are Narrow-leaved Red Ironbark, Lemon-scented Spotted Gum, Brown Bloodwood and Queensland Peppermint.	This species is endemic to south-east Queensland and is restricted to a small area around Gayndah, Mundubbera, Coulston Lakes and Proston in the Burnett District. Restricted distribution outside of Study Area. <b>Not likely to occur within Study Area.</b>
Mimosaceae	<i>Acacia handonis</i>	Hando's Wattle		X		V	V		Found in open forests and woodlands dominated by Tall Dusky-leaved Ironbark, Watson's Large-fruited Yellow Jacket <i>Corymbia watsoniana</i> , Budgeroo <i>Lysicarpus angustifolius</i> and Woolly She-oak <i>Allocasuarina inophloia</i> , in lateritic soils on gently undulating slopes and stony ridges and in association with Crowded-leaf Wattle, Catkin Wattle <i>Acacia julifera</i> , Rush-leaved Wattle <i>A. juncea</i> , Thread-leaf Hopbush <i>Dodonaea falcata</i> , Bipinnate Boronia <i>Boronia bipinnata</i> , Glabrous Boronia <i>B. glabra</i> , Sandstone Panic <i>Cleistochloa subjuncea</i> , Wiry Panic <i>Entolasia stricta</i> , Kenny's Bog-rush <i>Schoenus kennyi</i> , the Porcupine Grass, <i>Triodia scariosa</i> ssp. <i>yelarbonensis</i> , and Many-flowered Matrush <i>Lomandra multiflora</i> .	Restricted to the greater Barakula State Forest area, NNE of Chinchilla in southern Queensland. <b>Not likely to occur within Study Area.</b>
Mimosaceae	<i>Acacia laeta</i>	Tara Wattle	X	X	X	V	V		Found in open woodlands in sandy soils. Shrubby woodlands with Red Ironbark, Tumble-down Ironbark <i>Eucalyptus panda</i> , Broombush and other <i>Acacia</i> species and <i>Triodia</i> species (Craig Eddie pers. comm.)	Restricted to the Inglewood – Tara region in the Darling Downs district of southern Queensland. <b>Known to occur within Study Area</b>
Mimosaceae	<i>Acacia melvillei</i>	Myall	X				C	X	The community occurs on red-brown, sandy loam soils as scattered. A poorly conserved species and RE 11.9.6 in which it occurs has an	Occurs around Wandooan and Jondaryan. Frequent in Taroom Shire. <b>Known to occur within Study Area.</b>

Family	Species Name	Common Name	Source <sup>1</sup>			Management Status <sup>2</sup>			Habitat Preference <sup>3</sup>	Known Distribution <sup>3</sup> and Likelihood of Occurrence
			DERM	EPBC	CE	EPBC Act	NC Act	BAMM		
Mimosaceae	<i>Acacia microsperma</i>	Bowyakka	X				C	X	Endangered status. Doubtful records in Mulga. Yarran also occurs in poplar box shrubby woodland. Myall <i>Acacia melvillei</i> woodlands and Brigalow/Belah REs. SW of Dalby on road reserve. Very little in large remnants. Habitat for Painted Honeyeater.	Scattered in southern Queensland from Adavale SE to Talwood (near New South Wales border). <b>Known to occur within Study Area.</b>
Mimosaceae	<i>Acacia omalophylla</i>	Yarran Wattle	X				C	X	Grows in Belah, Brigalow, Myall and Poplar Box communities in brown soils with calcareous nodules, in Poplar Box open woodland in red earth and in various other soil and semi-arid vegetation types.	Scattered in southern Queensland from Adavale south east to Talwood (near New South Wales border). <b>Known to occur within Study Area.</b>
Mimosaceae	<i>Acacia spania</i>	Western Rosewood	X		X		R		Found in monotypic stands surrounded by open eucalypt woodland on shallow red soils. Often ironbark woodland.	Generally restricted to the Emerald district of central Queensland, although specimens have been collected from the Fairview area within the study area (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Mimosaceae	<i>Acacia tenuinervis</i>	Scrub Wattle	X		X		R		Found in eucalypt scrubs and forests in association with Tumble-down Ironbark, Narrow-leaved Red Ironbark and Poplar Box in red earths and ironstone gravels. Also recorded in monotypic stands on ridges and roadsides and in vegetation containing Brigalow. Also Dusky-leaved Ironbark and, occasionally, White Cypress Pine communities.	Restricted to a few localities in south-eastern Queensland, from near Glenmorgan, north-west to Injune and east to just west of Monto. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Mimosaceae	<i>Acacia wardellii</i>	Thomby Range Wattle	X	X	X	V	V		Found in eucalypt woodland in gravelly soils on shallow weathered sandstone. Occurs on ridge crests and slopes with loamy and gravelly soil along the edges of woodlands or in clearings; occurs with Dusky-leaved Ironbark, Narrow-leaved Red Ironbark, Queensland Peppermint, Brown Bloodwood, White Cypress Pine, Smooth-barked Apple, Native Quinine <i>Alstonia constricta</i> and Bullock and various wattles (Eddie 2007).	Restricted to south of Roma, south-west of Chinchilla and the Thomby Range, near Surat, south-eastern Queensland. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Myrtaceae	<i>Calyptrix gurulmundensis</i>	Gurulmundi Fringe Myrtle	X	X		V	V		Open scrublands with sparse stunted <i>Eucalyptus</i> , <i>Acacia</i> and <i>Casuarina</i> species on ridge tops and Spinifex hummock grasslands with scattered shrubs in yellow lateritic sandy clay, shallow red gravelly soils on sandstone. Associated with Catkin Wattle, Thready-bark Oak <i>Allocasuarina inophloia</i> , Brown Bloodwood.	Restricted to the Gurulmundi, Guluguba and Barakula area in south-eastern Queensland. <b>Known to occur within Study Area.</b>
Myrtaceae	<i>Corymbia blosomei</i>		X				C	X	REs 11.5.21 and 11.5.1	<b>Not likely to occur within Study Area.</b>
Myrtaceae	<i>Eucalyptus argophloia</i>	Queensland White Gum	X	X		V	V		Found in open forests dominated by Brigalow, Belah or Inland Grey box in brown to black clay to clay-loam soils on flat terrain.	Restricted to the Chinchilla area, in southern Queensland. <b>Not likely to occur within Study Area.</b>
Myrtaceae	<i>Eucalyptus beaniana</i>	Bean's Ironbark	X	X		V	V		Found in woodlands in association with Lemon-scented Spotted Gum, Gympie Messmate <i>Eucalyptus doeziana</i> , the Ironbark <i>E. suffulgens</i> , Large-fruited Yellow Jacket, Brown Bloodwood and Narrow-leaved White Mahogany. In shallow, sandy soils on quartzose sandstone ridges.	Restricted to two localities at Isla Gorge and north-east of Baroondah Station in central Queensland. <b>Not likely to occur within Study Area.</b>
Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett Mallee	X				R		Found in monotypic stands of mallee growth in shrublands dominated by banksias and sometimes in association with Swamp Stringybark <i>Eucalyptus congionerata</i> , in poorly drained lowland areas, and in scattered distribution in more open parts of mixed eucalypt forests dominated by Lemon-scented Spotted Gum, Brown Bloodwood and Black Cypress Pine or Dusky-leaved Ironbark, Needlebark <i>E. planchoniana</i> and Yellow Stringybark <i>E. acmenoides</i> , in better drained soils. Found in sandy podosols with impeded drainage, shallow stony soils, clay loams and stony clays with a surface layer of loose stones, on low ridges and up to 457m altitude.	Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains. Records from the Gurulmundi area – possibly occurs in Stores County Resource Reserve in Woleebee gas field. <b>Possibly occurs within Study Area</b>
Myrtaceae	<i>Eucalyptus dunnei</i>	Dunn's White Gum	X				R		Found in open forests and along margin of rainforests, in deep, rich, basalt soils at 200 – 860m altitude and in association with New England Blackbutt <i>Eucalyptus campanuleta</i> , Sydney Blue Gum <i>E. saligna</i> , Tallowwood <i>E. microcorys</i> , Thin-leaved Stringybark <i>E. eugenioides</i> , Small-fruited Grey Gum <i>E. propinqua</i> , Flooded Gum, Forest She-oak <i>Allocasuarina torulosa</i> , Brush Box <i>Lophostemon confertus</i> , Hoop Pine <i>Araucaria cunninghamii</i> , Five-leaved Water Vine <i>Cissus hypoglauca</i> , White Euodia <i>Melicope micrococca</i> , Molucca Raspberry <i>Rubus moluccanus</i> , Pink-flowered Native Raspberry <i>Rubus parvifolius</i> and Native Raspberry <i>R. rosifolius</i> .	Restricted to south-eastern Queensland and north-eastern New South Wales. <b>Not likely to occur within Study Area.</b>
Myrtaceae	<i>Eucalyptus rhombica</i>	Diamond-fruited Ironbark	X				C	X	On sandstone ridges or low sandy rises.	Restricted distribution in Queensland from north-east of

Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2</sup>			Habitat Preference <sup>3</sup>	Known Distribution <sup>3</sup> and Likelihood of Occurrence
			DERM	EPBC	CE		EPBC Act	NC Act	BAMM		
Myrtaceae	<i>Eucalyptus suffulgens</i>		X		X			C	X	Open forest on sandstone ridges. Forms monotypic stands or occurs with Gum-topped Ironbark, Henderson's Bloodwood <i>Corymbia hendersonii</i> , and Thready-bark Oak.	Eidsvold to near Karara. Records from State forest areas beside Gilbert Gully. <b>Possibly occurs within Study Area.</b>
Myrtaceae	<i>Eucalyptus virens</i>	Shiny-leaved Ironbark	X	X			V	V		Found in woodlands dominated by Queensland Peppermint, the Apple <i>Angophora costata</i> , Tom Russell's Mahogany <i>Lysicarpus temifolius</i> and Woolly She-oak, in coarse sandy, skeletal soils on outcropping sandstone escarpments; forests dominated by Bullock and Red Ironbark in shallow, grey sandy soils on flat lands; and woodlands dominated by Bendo, the Smooth-barked Apple and Woolly She-oak, in coarse white sandy soils over sandstone on undulating lands.	Fairly widespread but scattered distribution in south-eastern Queensland. Usually on hills and ranges from the Carnarvon Range and Blackdown tableland south-eastwards to Isla Gorge, also on Callide Range near Biloela; endemic. Likely to occur within the extreme north-western portion of the study area (Fairview/Beilba State Forest) (Craig Eddie pers. comm.). <b>Possibly occurs within Study Area.</b>
Myrtaceae	<i>Eucalyptus viridis</i>	Green Mallee	X					C	X	Mallee shrubland on shallow light soils on rocky rises.	Restricted to four disjoint localities near Mt Moffatt in the Carnarvon area, Brovina area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Ingelwood in southern Queensland. <b>Possibly occurs within Study Area.</b>
Myrtaceae	<i>Homoranthus decumbens</i>	Decumbent Homoranthus		X			V	V		Found in tall shrublands and heathlands in association with the shrub <i>Goodenia racemosa</i> , Conebushes ( <i>Petrophile</i> spp.), Grass-trees ( <i>Xanthorrhoea</i> spp.) and Dwarf Banksia <i>Banksia oblongifolia</i> , in shallow sandy soils containing lateritic pebbles and on sandstone cliff edges and at 0 – 800m altitude.	Restricted to the Barakula Forestry Area near Chinchilla and the Blackdown Tableland National Park in southern and central Queensland. <b>Not likely to occur within Study Area.</b>
Myrtaceae	<i>Homoranthus papillatus</i>	Mouse Bush	X					R		Heathlands and open eucalypt forests in skeletal soils in soil pockets on granite outcrops and in rock crevices, in the Girraween National Park in southern Queensland.	<b>Not likely to occur in Study Area.</b>
Myrtaceae	<i>Melaleuca irbyana</i>	Swamp Tea-tree	X		X			R		Found in open eucalypt forests in poorly drained, usually clay soils in subtropical coastal regions.	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known to occur in north-western portion of study area (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Myrtaceae	<i>Micromyrtus carmata</i>	Keeled Heath-myrtle	X		X			E		Found in heathlands and woodlands in association with Narrow-leaved White Mahogany, Brown Bloodwood, Catkin Wattle, the Grevillea <i>Grevillea longistyla</i> , and Gurilmundi Fringe Myrtle and <i>Acacia triptera</i> , Tumble-down Ironbark in shallow sandy soils on crests of mountain ranges.	Restricted to a small area NW of Gurilmundi, in southern Queensland. Also known from 10km NW of Miles and an outlying population near westmar (Craig Eddie pers. comm.). <b>Known to occur within Study Area.</b>
Oleaceae	<i>Notelaea pungens</i>	Pungent Olive	X					R		Found in open forest and woodland communities dominated by Large-fruited Yellow Jacket, Lemon-scented Spotted Gum and Tumble-down Ironbark, in well drained, mostly shallow gravelly clay-loam or sandy soils, in undulating to hilly terrain on either sandstone or granite ridges.	Restricted to the Eidsvold region of south-eastern Queensland. <b>Not likely to occur within Study Area.</b>
Orchidaceae	<i>Diuris tricolor</i>	Pink Donkey-orchid	X	X			V	C		Found in sclerophyll forests and ironbark-acacia shrublands in association with White Cypress Pine, Poplar Box, Gum Coolibah <i>Eucalyptus intertexta</i> and often with a grassy to herbaceous understorey, in sandy soils on flats and small rises and sometimes red earths.	Restricted to coastal ranges eastern Australia, from south-east Queensland to the New South Wales - Victoria border. <b>Known to occur within Study Area.</b>
Orchidaceae	<i>Pterostylis cobarensis</i>	Cobar Greenhood Orchid	X	X			V	C		Found in eucalypt woodlands, open mallee and cypress pine shrubland in skeletal sandy loam soils on low stony ridges and slopes and in association with Morris' Grey Mallee <i>Eucalyptus morrisii</i> , Green Mallee, Gum Coolibah, Manara Hills Red Gum <i>E. vicina</i> , White Cypress Pine, Wilga, Belah, Spearwood <i>Acacia doratxydon</i> , Cassias ( <i>Senna</i> spp.) and Emu Bushes ( <i>Eremophila</i> spp.).	Restricted to the central eastern Australia from Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. <b>Known to occur within Study Area.</b>
Poaceae	<i>Bothriochloa biloba</i>	Lobed Blue-grass		X			V	C		Found in cleared eucalypt forests and relic grasslands dominated by Purple Wiregrass <i>Aristida ramosa</i> , Red-leg Grass <i>Bothriochloa macra</i> , Pitted Bluegrass <i>B. decipiens</i> and Windmill Grass <i>Chloris truncata</i> , in heavier-textured soils including brown or black clays.	Restricted to the Darling Downs region of southern Queensland and tablelands and western slopes of the Great Dividing Range in northern New South Wales. <b>Not likely to occur within Study Area.</b>

Family	Species Name	Common Name	Source <sup>1</sup>			Management Status <sup>2</sup>			Habitat Preference <sup>3</sup>	Known Distribution <sup>3</sup> and Likelihood of Occurrence
			DERM	EPBC	CE	EPBC Act	NC Act	BAMM		
Poaceae	<i>Dichanthium queenslandicum</i>	King Blue-grass		X		V	V		Found in black clay soils.	Restricted to Emerald and, rarely, the Darling Downs in Queensland. <b>Not likely to occur within Study Area.</b>
Poaceae	<i>Digitaria porrecta</i>	Finger Panic Grass	X	X		E	R		Found in grasslands on extensive basaltic plains in association with Queensland Bluegrass.	Restricted to coastal regions of south Queensland and in northern New South Wales. <b>Not likely to occur within Study Area.</b>
Poaceae	<i>Homopholis belsonii</i>	Belson's Panic Grass	X	X		V	E		Found in White box communities and Wilga woodlands on rocky hills; Belah forests in alluvial soils on flat to undulating lands; Poplar Box woodlands; and dry woodlands on poor soils derived from basalt at 200 – 520m altitude. Also recorded in Brigalow, Myall and Weeping Myall communities; Mountain Coolibah communities; and on roadsides.	Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales. <b>Known to occur within Study Area.</b>
Poaceae	<i>Sporobolus parvipatens</i>	Smooth Dropseed	X				R		Found in open grasslands and chenopod forblands associated with artesian mound springs of the Great Artesian Basin.	Restricted to Lake Galilee, central Queensland and Culgoa floodplain NP SE of Cunnamulla. <b>Not likely to occur within Study Area.</b>
Rhamnaceae	<i>Cryptandra ciliata</i>	Silky Cryptandra	X				R		Found in open grassy eucalypt forest on shallow, often clayey soils in rocky areas.	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. <b>Possibly occurs within Study Area.</b>
Rutaceae	<i>Philotheca sporadica</i>	a Waxflower	X	X		V	V		Found in low open acacia and eucalypt forest in shallow uniform sandy loams to clay loams on residual hills of laterised Cretaceous sandstones.	Restricted to north of Tara, approximately 12km east of Kogan in the Darling Downs District, in south-eastern Queensland. <b>Known to occur within Study Area.</b>
Rutaceae	<i>Zieria verrucosa</i>	Warty Zieria		X		V	V		Found in semi-evergreen vine thickets in red soils and in Red Ironbark woodland in red clay soils, on gently inclined hillslopes at 360 – 500m altitude.	Restricted to a small area near Mundubbera in south-eastern Queensland. <b>Not likely to occur within Study Area.</b>
Santalaceae	<i>Thesium australe</i>	Austral Toadflax	X	X		V	V		Found in damp sites in association with Kangaroo Grass in grasslands and grassy woodlands.	Restricted to the coastal regions of eastern Australia. <b>Not likely to occur within Study Area.</b>
Scrophulariaceae	<i>Microcarpaea agonis</i>	Microcarpaea	X	X		E	E		A wetland species found on the margins of <i>Eleocharis</i> – <i>Cyperus</i> spp. dominated seasonal swamplands.	Restricted to the Goondiwindi – Millmerran area in southern Queensland. <b>Possibly occurs within Study Area.</b>
Solanaceae	<i>Solanum papaverifolium</i>	a Nightshade	X				E		Found in croplands, grasslands and open woodlands on heavy clay soils.	Occurs in Darling Downs district of southern Queensland and northern New South Wales. <b>Not likely to occur within Study Area.</b>
Solanaceae	<i>Solanum stenopterum</i>	Winged Nightshade	X				V		Found in semi-evergreen vine thickets and Brigalow - Belah woodlands and sometimes grasslands on cracking clays.	Restricted to the Darling Downs and Burnett regions of southern Queensland and northwestern slopes region of New South Wales. <b>Known to occur within Study Area.</b>
Surianaceae	<i>Cadellia pentastylis</i>	Ooline	X	X		V	V		Found in semi-evergreen vine thickets in association with Native Quinine, Hard Alectryon <i>Alectryon subdentatus</i> , Leopard Ash <i>Flindersia collina</i> , Wilga and Narrow-leaved Bottle Tree <i>Brachychiton rupestris</i> on sandstone and basalt slopes and Currawong, Brigalow and Belah communities on undulating clay plains and low hills at altitudes 200 – 500m.	Known to occur within Woleebee tenement, between Jackson-Wandoan Road and Gurulmundi State Forest. <b>Known to occur within Study Area.</b>
Zamiaceae	<i>Macrozamia fearnsidei</i>		X	X	X	V	C		Occurs in open woodlands of Large-fruited Yellow Jacket, Lemon-scented gum and Budgeroo.	Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroom, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme north-western end (Beilba/Kentucky area) (QLD Herbarium records). <b>Possibly occurs within Study Area.</b>

<sup>1</sup> Source abbreviations as follows: **DERM** = Queensland Herbarium; **EPBC** = EPBC Online Protected Matters Search Tool; **CE** = records obtained or communicated by Boobook (Craig Eddie pers. comm.).<sup>2</sup> Status abbreviations are as follows: **E** = Endangered, **V** = Vulnerable, **R** = Rare, **NT** = Near Threatened, **C** = Least Concern Wildlife, **X** = non-EVR priority species for the BBS bioregion.<sup>3</sup> Detailed profiles for species of special conservation significance known or considered possible occurrences are provided in **Appendix K**.



**Table J.2. Likelihood of occurrence of terrestrial fauna species of special conservation significance within the Study Area**

Class/Family	Species Name	Common Name	Source <sup>1</sup>					Management Status <sup>2,3</sup>			Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
Gastropoda Camaenidae	In preparation <sup>6</sup>	Dulacca Woodland Snail Camaenidae BL12 <sup>7</sup>						E <sup>8</sup>			Eight records. One Queensland Museum record and seven BAAM survey records (2009), all in Carinya tenement. Known only from Study Area.	Recorded from REs 11.4.3, 11.5.1/11.7.6, 11.7.7/11.7.4/11.5.1 and 11.9.5/11.9.10 but not normally expected to occur in REs 11.4.3 and 11.9.5.
Gastropoda Camaenidae	In preparation <sup>6</sup>	Brigalow Woodland Snail Camaenidae BL13 <sup>7</sup>						CE <sup>8</sup>			Five BAAM survey records (2009), three in Talinga and Orana tenements with another just west of the Condabri tenement.	Known from REs 11.3.1, 11.3.3/11.3.4/11.3.25 and 11.3.25/11.3.4/11.3.3.
Insecta Lycaenidae	<i>Hypochrysops piceata</i>	Bullock Jewell							E		Known from unpublished records very close to Gilbert Gully tenement. Possibly occurs in Gilbert Gully.	Most likely to occur in REs 11.3.18, 11.5.1, 11.5.1a, 11.5.4 and possibly 11.3.14. Requires large and very old Bullock that have colonies of attendant ants <i>Anonychomyrma</i> sp.
Insecta Lycaenidae	<i>Jalmenus eubulus</i>	Pale Imperial Hairstreak	x				x		V		Six WildNet records, one in Gilbert Gully tenement and remainder outside of tenements. One survey record in Gurdumundi State Forest (Unidel Energy and Infrastructure 2009). Probably more common in Study Area than records suggest.	Mature stands of Brigalow. Larvae are variously reported as specialised to feeding on small understory Brigalow or including other <i>Acacia</i> species in their diet (Braby 2000, 2004; Eastwood <i>et al.</i> 2008). Most likely in REs 11.3.1, 11.4.3, 11.9.5 and 11.9.6.
Amphibia Myobatrachidae	<i>Limnodynastes salmini</i>	Salmon-striped Frog	x	x			x		C	x	100+ WildNet records. 10 Queensland Museum records. Two BAAM survey records (2009) in Gilbert Gully tenement. Two survey records (Unidel Energy and Infrastructure 2009). Widespread in Study Area. Common in suitable habitat.	Variety of habitats on lowland alluvial flats with black clay soils (McFarland <i>et al.</i> 1999a, b). Most likely in REs 11.3.2, 11.3.3, 11.3.17, 11.3.25, 11.3.27b, 11.4.3 and 11.9.5.
Amphibia Myobatrachidae	<i>Uperoleia fusca</i>	Dusky Toadlet	x	x			x		C	x	One WildNet record, outside of tenements in north-east of Study Area. One Queensland Museum record (Lake Broadwater <sup>10</sup> ). Known to the north and east of the Study Area (McFarland <i>et al.</i> 1999a, b). Marginal, or absent, in the Study Area. Not expected to occur.	
Amphibia Hylidae	<i>Cyclorana verrucosa</i>	Rough Frog	x	x					R		20 WildNet records, including from Gilbert Gully, Condabri and Carinya tenements. Eight Queensland Museum records. Likely to occur in any suitable habitat, including non-remnant vegetation and cleared land, throughout the Study Area.	Black soil plains flooded by heavy rains (McFarland <i>et al.</i> 1999a, b; Cogger 2000). Important habitat includes REs 11.3.2, 11.4.3 and 11.4.3a.
Reptilia Chelidae	<i>Emydura macquarii</i>	Macquarie Turtle	x						C	x	Nine WildNet records. Sparse in the Study Area.	Large rivers and associated large waterholes on floodplains (Cogger 2000) in REs 11.3.25 and 11.3.27b.
Reptilia Chelidae	<i>Macrochelodina expansa</i>	Broad-shelled Turtle	x	x					C	x	Eight WildNet records. One Queensland Museum record. Sparse in the Study Area.	Vegetated deep permanent waterbodies, primarily in rivers (McFarland <i>et al.</i> 1999a, b; Cogger 2000) in REs 11.3.25 and 11.3.27b.
Reptilia Chelidae	<i>Rheodytes leukops</i>	Fitzroy Turtle <sup>3</sup>				x	x	V	V		No actual database records, EPBC search only. Known to the north of the Study Area (McFarland <i>et al.</i> 1999a, b). Not expected to occur.	
Reptilia Gekkonidae	<i>Strophurus taenicauda</i>	Golden-tailed Gecko	x	x					NT		74 WildNet records, including records from Talinga, Kainama, Condabri and Carinya tenements. Seven Queensland Museum records. 28 BAAM survey records (2009) in Dalwogan, Combabula, Ramyard, Condabri, Carinya and Talinga tenements. Golder Associates (2008) survey records from Talinga (probably included in WildNet). Common and widespread in Study Area.	Acacia scrubs including Brigalow, eucalypt and <i>Callitris</i> woodland, and dry sclerophyll forest (McFarland <i>et al.</i> 1999a, b; Cogger 2000; Wilson 2005). Many different REs on land zones 3, 4, 5, 7, 9 and 10. Most important habitat includes REs 11.3.14, 11.4.3, 11.4.3a, 11.5.1, 11.5.1a, 11.5.4, 11.5.4a, 11.7.2, 11.7.4, 11.7.6, 11.7.7, 11.9.5, 11.10.1, 11.10.1d, 11.10.9 and 11.10.11.
Reptilia Pygopodidae	<i>Delma plebeia</i>	Leaden Delma	x	x					C	x	18 WildNet records. Two Queensland Museum records. Sparse in the Study Area.	Open woodland and forest, particularly with tussock grass. Also disturbed and degraded areas and gardens, sheltering under tin and other human debris (Ehmann 1992; Low 1995). Most likely in RE 11.5.5 but also on Land Zones 3, 4 and 9.
Reptilia Pygopodidae	<i>Delma torquata</i>	Adorned (Collared) Delma <sup>3</sup>						V	V		One published record for Gilbert Gully (Hines <i>et al.</i> 2000). No database records, known to the east of the Study Area (McFarland <i>et al.</i> 1999a, b). Cryptic species that may occur elsewhere in the Study Area in suitable habitat.	Open eucalypt forest with a shrub and tussock grass understory. Soil type is usually shallow and deep-cracking or stony (Ehmann 1992; Wilson and Swan 2008). RE 11.3.2 could be an important habitat for the species but most typical habitat is Land Zone 10 in REs 11.10.1 and 11.10.1d.
Reptilia Pygopodidae	<i>Paradelma orientalis</i>	Brigalow Scaly-foot	x	x			x	V	V		16 WildNet records. Two Queensland Museum records. One BAAM survey record (2009) in Combabula tenement. Database records from Talinga, Kainama, Gilbert Gully, Condabri, Woleebee and Carinya tenements. Could occur throughout the Study Area.	Brigalow and other <i>Acacia</i> species woodlands, sparse tussock grass vegetation on grey cracking soils, Poplar Box open woodland, sandstone rises in dry sclerophyll forests. Ironbark dominated forest and mixed open woodland with Spinifex (Shea 1987; Schulz and Eyre 1997; Kutt <i>et al.</i> 2003). Many different REs on Land Zones 3, 4, 5, 7, 9 and 10. Most important

Class/Family	Species Name	Common Name	Source <sup>1</sup>					Management Status <sup>2,3</sup>			Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
												habitats are REs 11.9.5, 11.10.1, 11.10.1d and 11.10.4.
Reptilia Scincidae	<i>Anomalopus mackayi</i>	Five-clawed Worm-skink <sup>3</sup>				x	x	V	E			
Reptilia Scincidae	<i>Ctenotus ingrami</i>	Unspotted Yellow-sided Ctenotus	x	x					C	x		Woodland, including Brigalow and Belah, on heavy to stony soils (Wilson and Swan 2008) in Land Zones 3, 4, 7, 9 and 10.
Reptilia Scincidae	<i>Cyclodomorphus gerrardii</i>	Pink-tongued Skink	x	x					C	x		Moist timbered habitats (Wilson 2005). Most likely in REs 11.3.4, 11.3.25 and 11.3.27b.
												Variety of drier forests and woodlands (usually on well drained, coarse gritty soils) including Poplar Box on alluvial soils, low ridges, <i>Callitris</i> on sands, Belah (Ehmann 1992; Cogger 2000; Drury 2001; Wilson 2005). Also occur in highly degraded sites and where there are log piles and rabbit warrens (EPA 2003). Important habitat for the species includes RE 11.3.2, 11.3.3, 11.3.14, 11.4.4 and 11.9.3. Also occurs in Land Zone 5.
Reptilia Scincidae	<i>Tiliqua rugosa</i>	Shingle-back	x	x					C	x		Occurs in wide variety of habitats, from open forest to grassland and pasture (Ehmann 1992).
Reptilia Agamidae	<i>Amphibolurus muricatus</i>	Jacky Lizard	x				x		C	x		
Reptilia Agamidae	<i>Chlamydosaurus kingii</i>	Filled Lizard	x				x		C	x		Dry sclerophyll forest and woodland with open shrubby or tussock grass understory (Ehmann 1992). Most likely in REs 11.10.1 and 11.10.1d in the northeast of the Study Area.
Reptilia Agamidae	<i>Physignathus lesueurii</i>	Eastern Water Dragon	x	x					C	x		Tree- and bush-lined watercourses (Ehmann 1992). Likely only in RE 11.3.25.
Reptilia Agamidae	<i>Tympanocryptis pinguicolla</i>	Grassland Earless Dragon <sup>3</sup>				x	x	E	E			
												Woodland, billabongs, flood plains and black soil plains (Ehmann 1992). mainly on hard soils and heavy loams (Wilson 2005). The most important habitats are REs 11.3.14, 11.3.39, 11.5.1 and 11.5.4, 11.10.1, 11.10.4, 11.10.7 and 11.10.13.
Reptilia Varanidae	<i>Varanus panoptes</i>	Yellow-spotted Monitor	x	x					C	x		Black soils and stony ridge country in Brigalow woodland and grasslands (Richardson 2006). Occurs in Land Zones 3, 4, 5, 7, 9 and 10.
Reptilia Boidae	<i>Aspidites ramsayi</i>	Woma <sup>3</sup>	x	x					R			Occurs in a wide range of habitats, particularly with deep leaf litter, but severely impacted by presence of Cane Toads and livestock (Ehmann 1992). Important REs in the Study Area include 11.4.3, 11.4.3a, 11.7.1, 11.9.4a, 11.9.4b and 11.9.5. RE 11.7.5 may prove to be important but requires survey effort.
Reptilia Elapidae	<i>Acanthophis antarcticus</i>	Common Death Adder	x	x					R			Sclerophyll forests, woodlands and shrublands on compacting and deep cracking soils (Ehmann 1992). Occurs in Land Zones 3, 4, 5, 9 and 10.
Reptilia Elapidae	<i>Cryptophis boschmai</i>	Carpentaria Snake	x	x					C	x		
Reptilia Elapidae	<i>Denisonia maculata</i>	Ornamental Snake			x		x	V	V			
												Poorly known but most records appear in open forests and woodlands, particularly Brigalow and woodlands growing on cracking black clay and clay loams (Cogger <i>et al.</i> 1993). Also recorded from dry eucalypt forests and may occur in vine thickets. Occurs in Land Zones 3, 4, 5, 7, 9 and 10 but insufficiently known to identify most important REs.
Reptilia Elapidae	<i>Furina dunmali</i>	Dunmall's Snake	x	x		x	x	V	V			Generally restricted to cracking, flood-prone soils along floodplains and near watercourses (Wilson 2005). Important REs include 11.3.1, 11.3.2, 11.3.4, 11.3.25, 11.3.27b, 11.4.3,
Reptilia Elapidae	<i>Hemiaspis damelii</i>	Grey Snake	x	x					E			

Class/Family	Species Name	Common Name	Source <sup>1</sup>					Management Status <sup>2,3</sup>			Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
												11.4.3a and 11.9.5.
Reptilia Elapidae	<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	x	x					C	x	41 WildNet records, 21 Queensland Museum records, One BAAM survey record (2009) in Combabula tenement. Common in the Study Area.	Dry sclerophyll forests and woodlands on floodplains or near watercourses (Wilson and Swan 2008). Most common in REs 11.3.25 and 11.3.27b but also in Land Zones 4, 5, 7, 9 and 10.
Reptilia Elapidae	<i>Pseudechis guttatus</i>	Spotted Black Snake	x	x					C	x	45 WildNet records, 13 Queensland Museum records. Common in the Study Area, though possibly declining.	Riverine forest, dry sclerophyll forest and woodland on flood plains, near swamps and temporary wetlands (Ehmann 1992; Wilson 2005). Most important REs are 11.3.1, 11.3.4, 11.3.25, 11.3.27b, 11.4.3, 11.4.3a and 11.9.5.
Aves Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	x		x		x		R		One WildNet record, of unknown location and date (pre-1975) McFarland <i>et al.</i> (1999a, b). One Birds Australia record (Lake Broadwater <sup>10</sup> ). Very occasional visitor to the database search area. Study Area provides very little habitat, though farm dams are used occasionally by this species.	Terrestrial wetlands, with a preference for large, well-vegetated swamps and creeks, but moving to open water after breeding or in dry periods (Marchant and Higgins 1990).
Aves Anatidae	<i>Nettapus coromandelianus</i>	Cotton Pygmy-goose	x		x		x	M	R		One WildNet record, of unknown location and date (pre-1975) McFarland <i>et al.</i> (1999a, b). Seven Birds Australia records (all outside the Study Area). Marginal occurrence in the Study Area, more frequent to north and east (McFarland <i>et al.</i> 1999a, b), but could occur on waterbodies with aquatic vegetation.	Terrestrial wetlands, preferring freshwater with abundant floating and submerged aquatic vegetation, interspersed with patches of open water (Marchant and Higgins 1990).
Aves Columbidae	<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern subspecies)		x	x		x	V	V		Three Queensland Museum records, two from the '1800s and one from 1936. Two Birds Australia records, one outside the Study Area and the other within the area but not within a tenement. One BAAM survey record (2009) in Ramyard tenement. '[O]bserved occasionally' in database search area (URS 2009). Very sparse in the Study Area.	Dry grassy eucalypt woodlands and open forests, also <i>Callitris</i> and acacia woodlands. Most birds live in sandy sites near permanent water (Frith 1982; Blakers <i>et al.</i> 1984; Crome and Shields 1992). Occurs in Land Zones 3, 4, 5, 7, 9 and 10.
Aves Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail	x	x	x		x	M	S		Eight WildNet records. One Queensland Museum record. 19 Birds Australia records. Widespread and common non-breeding visitor to the Study Area.	An aerial species, may occur over any habitat type, including cleared land and infrastructure.
Aves Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	x		x			M	S		Six WildNet records. One Birds Australia record. Widespread but infrequent non-breeding visitor to the Study Area.	An aerial species, may occur over any habitat type, including cleared land and infrastructure.
Aves Fregatidae	<i>Fregata ariel</i>	Lesser Frigatebird	x					M	S		One WildNet record. Marine species, vagrant to Study Area. There is no suitable habitat and the species is not expected to occur again.	
Aves Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	x	x	x				R		Eight WildNet records, including records from Talinga and Condabri tenements. One Queensland Museum record, 1886. Seven Birds Australia records, six from outside the Study Area, and one record from Orana tenement. One BAAM survey record (2009) in Talinga tenement. Scarce visitor to the Study Area. Possible on larger waterbodies, including impoundments, but also frequents flooded paddocks. Could occur throughout.	Most frequently recorded in open fresh waters such as shallow swamps, billabongs and pools on floodplains (Pingle 1985; Marchant and Higgins 1990).
Aves Ardeidae	<i>Ardea modesta</i>	Eastern Great Egret	x		x		x	M	S		10 WildNet records. 74 Birds Australia records. Four BAAM survey records (2009) in Carinya, Condabri, Ramyard and Talinga tenements. Common and widespread species that could occur throughout the Study Area.	Shallow wetland habitats, including man-made dams and ponds and moist grasslands (Marchant and Higgins 1990).
Aves Ardeidae	<i>Ardea ibis</i>	Cattle Egret	x		x		x	M	S		Six WildNet records. Nine Birds Australia records. Most likely in paddocks and non-remnant vegetation. Could occur in any open habitats within the Study Area, particularly with livestock.	Grasslands, wetlands, pasture and crops. Strongly associated with grazing animals (Pingle 1985; Marchant and Higgins 1990).
Aves Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis	x	x	x			M	S		Four WildNet records. One Queensland Museum record. 11 Birds Australia records. Could occur on any suitable waterbody throughout the Study Area.	Terrestrial wetlands, preferring inland freshwater wetlands with abundant aquatic flora (Pingle 1985; Marchant and Higgins 1990).
Aves Accipitridae	<i>Pandion cristatus</i>	Eastern Osprey	x					M	S		One WildNet record. Vagrant to the Study Area. Few suitably large waterbodies in the Study Area.	Mainly coastal habitats but can occur on inland rivers and lakes (Debus 1998).
Aves Accipitridae	<i>Lophoictinia isura</i>	Square-tailed Kite	x	x	x		x		R		16 WildNet records, including one in Talinga tenement. One Queensland Museum record. Five Birds Australia records, four from outside the Study Area. Breeding known from Talinga tenement in 1960s, 70s, 80s and 90s (Eddie 2008). Could occur in most woodland and forest areas in the Study Area.	Wide variety of habitat types but most records are from woodlands and forests, particularly those on fertile soils (Marchant and Higgins 1993). Most important RE is 11.3.25.
Aves Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	x		x		x	M	S		Seven WildNet records. 22 Birds Australia records. One BAAM survey record (2009) in Talinga tenement. Few suitably large waterbodies in the Study Area.	Terrestrial wetlands, including large rivers, freshwater swamps, lakes, reservoirs and billabongs (Marchant and Higgins 1993).

Class/Family	Species Name	Common Name	Source <sup>1</sup>					Management Status <sup>2,3</sup>			Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
Aves Accipitridae	<i>Accipiter novaehollandiae</i>	Grey Goshawk	x		x				R		Two WildNet records, 1971 and 1978, from Talinga and Gilbert Gully tenements respectively. Three Birds Australia records, two from outside the Study Area and one from Talinga tenement. Very occasional visitor. More frequently recorded to the east of the Study Area (McFarland <i>et al.</i> 1999a, b).	Rainforest, tall open forests, woodlands, wooded gorges, dense timber along watercourses, and farmland, usually in the 760+ mm rainfall zone (Marchant and Higgins 1993).
Aves Accipitridae	<i>Erythrotriorchis radiatus</i>	Red Goshawk <sup>3</sup>	x			x		V	E		Two WildNet records, 1978 and pre 1975 (McFarland <i>et al.</i> 1999a, b). Recorded from Talinga tenement. Very occasional visitor, probably largely absent from the Study Area.	Woodlands and forests, ideally with a mosaic of vegetation types and permanent water, particularly riverine forests. The species avoids both very dense and very open habitats (Marchant and Higgins 1993).
Aves Falconidae	<i>Falco hypoleucos</i>	Grey Falcon	x				x		R		Two WildNet records, dates unknown though one is pre-1975 (McFarland <i>et al.</i> 1999a, b). '[O]n average one seen every 10 years' at Rockwood Station in Talinga tenement (Eddie 2008). Vagrant/occasional visitor to the Study Area.	Semi-arid and arid woodlands, grasslands and wooded watercourses, typically in areas of less than 500 mm annual rainfall (Olsen 1998; Debus 1998).
Aves Rallidae	<i>Lewinia pectoralis</i>	Lewin's Rail	x				x		R		One WildNet database record. Bred in Talinga tenement in 1970s (Eddie 2008). Possibly duplicated record. Two additional(?) records, one pre-1975 and one between 1975 and 1999 (McFarland <i>et al.</i> 1999a, b). Although cryptic likely to be vagrant or very occasional visitor to the Study Area.	Wetland areas, particularly those dominated by thick grasses, sedges, rushes and reeds and including minor creeklines or even paddocks (Pizzezy and Knight 2003).
Aves Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew	x	x	x				C	x	40 WildNet records. One Queensland Museum record. Three Birds Australia records. Uncommon in the Study Area.	Sparsely timbered woodland with fallen leaves and branches but few shrubs. Also found in pasture, golf courses and parklands (Pizzezy and Knight 2003). Occurs in Land Zones 3, 4, 9 and 10.
Aves Charadriidae	<i>Pluvialis fulva</i>	Pacific Golden Plover	x					M	S		Two WildNet records. Very occasional visitor to the Study Area.	Usually intertidal sandflats and mudflats and salt marshes but also short grass in paddocks and crops (Geering <i>et al.</i> 2007). Most likely on artificial waterbodies and in fringing non-remnant vegetation.
Aves Pedionomidae	<i>Pedionomus torquatus</i>	Plains-wanderer	x				x	V	V		Four WildNet records, all of unknown date and location. One pre-1975 record for Study Area (McFarland <i>et al.</i> 1999a, b), included in WildNet. Vagrant to the Study Area. Most likely in non-remnant vegetation.	Sparse, natural grasslands with short grass and a few taller shrubby plants (Geering <i>et al.</i> 2007).
Aves Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe <sup>11</sup>	x	x	x			V, M	V		One WildNet record, pre 1975 (McFarland <i>et al.</i> 1999a, b). One Birds Australia record from outside the Study Area. '[S]een most years' in Talinga tenement (Eddie 2008). Cryptic species that could occur in any suitable habitat including drainage ditches, flooded paddocks and farm dams. Probably under-recorded in the Study Area.	Terrestrial shallow wetlands, ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains (Marchant and Higgins 1993). Most likely in REs 11.3.2, 11.3.25 and 11.3.27b but could also occur in gilegaled areas.
Aves Scolopacidae	<i>Gallinago hardwickii</i>	Latham's Snipe	x	x	x			M	S		Six WildNet records. One Queensland Museum record. 13 Birds Australia records. Uncommon visitor to the Study Area.	Swamp and marsh margins and in wet pasture (Pringle 1987).
Aves Scolopacidae	<i>Limosa limosa</i>	Black-tailed Godwit	x	x	x			M	S		One WildNet record. One Birds Australia record (Lake Broadwater <sup>10</sup> ). Very occasional visitor to the Study Area.	Fresh and brackish wetlands and intertidal mudflats (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Limosa lapponica</i>	Bar-tailed Godwit	x					M	S		One WildNet record. Rarely found away from coast. Possibly misidentified Black-tailed Godwit. Either absent or very occasional visitor to the Study Area.	Coastal areas with intertidal mudflats (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Numenius phaeopus</i>	Whimbrel	x					M	S		One WildNet record. Rarely found away from coast. Record is possibly a misidentified Little Curlew <i>Numenius minutus</i> which does occur inland. Either absent or very occasional visitor to the Study Area.	Coastal areas with intertidal mudflats (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper	x					M	S		One WildNet record. Very occasional visitor to the Study Area.	Mangrove inlets, rocky shores and creeks, channels and dams (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	x	x	x			M	S		Three WildNet records. One Queensland Museum record. Three Birds Australia records. Occasional visitor to the Study Area.	Saltwater and freshwater wetlands and intertidal mudflats (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper	x	x	x			M	S		One WildNet record. Nine Birds Australia records. Occasional visitor to the Study Area.	Brackish and freshwater wetlands (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper	x	x	x			M	S		One WildNet record. Two Birds Australia records (Lake Broadwater <sup>10</sup> & Roma). Very occasional visitor to the Study Area.	Well vegetated, shallow, freshwater wetlands (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Calidris ruficollis</i>	Red-necked Stint	x					M	S		One WildNet record. Very occasional visitor to the Study Area.	Wide range of freshwater and saltwater habitats (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	x	x	x			M	S		Three WildNet records. One Queensland Museum record. 13 Birds Australia records. Most commonly recorded sandpiper in	Coastal and inland areas, preferring non-tidal fresh or brackish wetlands (Geering <i>et al.</i> 2007).



Class/Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2,3</sup>				Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
Aves Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	x			x		M	S		the Study Area. One WildNet record. One Birds Australia record (Lake Broadwater <sup>6</sup> ). Very occasional visitor to the Study Area.	Intertidal mudflats and freshwater wetlands (Geering <i>et al.</i> 2007).
Aves Scolopacidae	<i>Philomachus pugnax</i>	Ruff	x					M	S		One WildNet record. Seldom recorded in Queensland. Very occasional visitor to the Study Area.	Wide range of freshwater and saltwater habitats (Geering <i>et al.</i> 2007).
Aves Turnicidae	<i>Turnix melanogaster</i>	Black-breasted Button-quail <sup>3</sup>	x			x		V	V		One WildNet record, no location or date details available. Known to the north and east of Study Area (McFarland <i>et al.</i> 1999a, b). Possibly occurs in softwood scrubs in the Study Area. However status in the Study Area not confirmed and it may not be present.	Semi-evergreen vine thicket, low microphyll vine forest and dry rainforest of Brigalow, Belah and Bottletree (Marchant and Higgins 1993). Most likely to occur in REs 11.8.3, 11.9.4a and 11.9.4b in the Study Area.
Aves Laridae	<i>Hydroprogne caspia</i>	Caspian Tern	x					M	S		Two WildNet records. Very occasional visitor to the Study Area. Few suitably large waterbodies in the Study Area.	Mostly coastal habitats but also inland terrestrial wetlands including lakes, reservoirs and large rivers (Higgins and Davies 1996).
Aves Cacatuidae	<i>Calyptorthynchus lathami</i>	Glossy Black-Cockatoo <sup>3</sup>	x	x	x				V		11 WildNet records, including from Talinga, Kainama and Gilbert Gully tenements. Two Queensland Museum records. 11 Birds Australia records, including five from outside the Study Area and records from Condabri and Gilbert Gully tenements. Three BAAM survey records (2009) in Woleebee and Combabula tenements and 19 feed tree locations in Talinga, Woleebee, Combabula, Condabri, Carniya and Gilbert Gully tenements. Golder Associates (2008) survey records from Talinga (probably included in WildNet). Uncommon but widespread in the Study Area.	Forests and woodlands, preferring habitats dominated by she-oaks in the canopy or middle stratum due to their dependence on she-oaks for food. The species is also reliant on suitable large hollows for nesting (Higgins 1999). Important REs include 11.3.1, 11.4.3, 11.4.7, 11.4.10, 11.7.1, and 11.9.5.
Aves Cacatuidae	<i>Lophochroa leadbeateri</i>	Major Mitchell's Cockatoo <sup>3</sup>	x				x		V		Two WildNet database records, one pre-1975 and one between 1975 and 1999 (McFarland <i>et al.</i> 1999a, b). Record in Talinga tenement in late 1980s (Eddie 2008). Vagrant to the Study Area.	Dry woodlands, mainly in semi-arid and arid regions. Also riverine forest, shrublands and heathlands (Higgins 1999).
Aves Psittacidae	<i>Polytelis swainsonii</i>	Superb Parrot				x		V			No actual database records, EPBC search only. Not expected to occur.	
Aves Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	x			x		E	E		Three WildNet records, including Broadbent's 1885 record, a pre-1975 record whose location is uncertain and one 1964 record from Rockwood Station in Talinga tenement. Also seen three or four times in recent decades at Rockwood Station where it is considered a 'rare visitor' (Eddie 2008). Non-breeding winter migrant which is a very occasional visitor to the Study Area.	Mainly dry open eucalypt forest and woodland, including those with Grey Box or River Red Gum (Higgins 1999). Most likely to be recorded in REs 11.3.25, 11.3.26 and 11.3.27b in the Study Area.
Aves Psittacidae	<i>Neophema putchella</i>	Turquoise Parrot	x		x				R		Six WildNet records, including from Talinga, Kainama and Gilbert Gully tenements. Three Birds Australia records, all from outside the Study Area. Two BAAM survey records (2009) in Talinga tenement and near Gilbert Gully tenement. Present in Talinga until 1980s, one record in each of the 1970s, 80s and 90s (Eddie 2008). Sparse in the Study Area, most likely in the south.	Eucalypt woodlands and open forests, favouring forest edges along grasslands and pasture. They are also commonly found in clearings, remnant trees in farmland, orchards and golf courses (Higgins 1999; NPWS 2003). Likely only in Land Zone 3, especially RE 11.3.25.
Aves Strigidae	<i>Ninox strenua</i>	Powerful Owl	x	x			x		V		One record, Broadbent (1885), also recorded in WildNet and Queensland Museum databases. Known to the north and east of the Study Area (McFarland <i>et al.</i> 1999a, b). Not expected to occur.	
Aves Strigidae	<i>Ninox connexus</i>	Barking Owl	x	x	x				C	x	45 WildNet records. Three Birds Australia records. One Queensland Museum record. Three BAAM survey records (2009) in Woleebee tenement. One survey record in Gurulimundi State Forest (Unidel Energy and Infrastructure 2009). Common but patchy in the Study Area.	Dry sclerophyll forests and woodlands, often dominated by eucalypts and containing large trees for roosting or breeding. Nest in hollows in large trees, usually near watercourses or wetlands (Higgins 1999). Occurs in Land Zones 3, 4, 5, 7 and 10 but most likely in REs 11.3.25 and 11.3.27b.
Aves Tytonidae	<i>Tyto novaehollandiae</i>	Masked Owl	x						C	x	Five WildNet records. Very uncommon in the Study Area but known from Talinga tenement.	Wooded habitats that provide trees with suitable hollows for roosting and breeding. Mostly open forest and woodland with sparse understorey, adjoining open areas (Higgins 1999). Most likely in Land Zones 3 and 9.
Aves Tytonidae	<i>Tyto longimembris</i>	Eastern Grass Owl	x						C	x	Four WildNet records, all outside the actual Study Area. Species may not occur in the Study Area, though easily overlooked.	Open tussock grasslands, usually in treeless areas. Often in marshy areas and in agricultural land (Higgins 1999).
Aves Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater	x	x	x			M	S		12 WildNet records. Four Queensland Museum records. 74 Birds Australia records. Common and widespread in the Study Area.	Open or lightly timbered areas, shrublands, farmland, cleared land, mangroves and rainforest edges. Also disturbed areas that have exposed bare soil in bank for breeding (Higgins 1999).
Aves Climacteridae	<i>Climacteris picumnus</i>	Brown Treecreeper	x	x	x				C	x	28 WildNet records. Two Queensland Museum records. Five Birds Australia records. One survey record in Gilbert Gully area (Unidel Energy and Infrastructure 2009). Uncommon in the Study Area.	Woodlands dominated by eucalypts, especially stringybark or other rough-barked eucalypts, usually with grassy understorey and abundant dead trees and/or fallen timber (Higgins <i>et al.</i> 1999).



Class/Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2,3</sup>			Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM	
										Area.	2001). In the Study Area most likely in riverine forests in Land Zone 3.
Aves Acanthizidae	<i>Chthonicola sagittata</i>	Speckled Warbler	x	x	x				C	x	Dry sclerophyll forests and woodlands with scattered shrubs and a grassy ground layer (Higgins and Peter 2002). Occurs in all Land Zones in areas with suitable understorey.
Aves Meliphagidae	<i>Anthochaera phrygia</i>	Regent Honeyeater <sup>12</sup>	x	x		x	x	E, M	E		One record, Broadbent (1885), also recorded in Queensland Museum database. Not expected to occur.
Aves Meliphagidae	<i>Melithreptus gularis</i>	Black-chinned Honeyeater	x	x	x				R		Four WildNet records. Recorded from Kainama and Condabri tenements. One record, Broadbent (1885), also recorded in Queensland Museum database. Two Birds Australia records, both outside of Study Area. Very occasional visitor to the Study Area.
Aves Meliphagidae	<i>Grantella picta</i>	Painted Honeyeater <sup>3</sup>	x		x				R		Nine WildNet records, including from Talinga tenement. 23 Birds Australia records, two from Talinga tenement and the remainder from outside of the Study Area. Generally uncommon visitor to the Study Area but can be locally common.
Aves Pomatostomidae	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	x	x	x				C	x	200+ WildNet records. Six Queensland Museum records. 100+ Birds Australia records. 66 BAAM survey records (2009), recorded in all tenements. Common and widespread, including in disturbed areas and non-remnant vegetation, in the Study Area.
Aves Pomatostomidae	<i>Pomatostomus superciliosus</i>	White-browed Babbler	x	x			x		C	x	29 WildNet records. One record, Broadbent (1885), also recorded in Queensland Museum database. Uncommon, in the Study Area mostly occurs south of Chinchilla.
Aves Rhipiduridae	<i>Rhipidura rufifrons</i>	Rufous Fantail	x	x	x	x		M	S		Four WildNet records. One Queensland Museum record. Seven Birds Australia records. Though patchy, this species is well established within the study area (Craig Eddie pers. comm.).
Aves Monarchidae	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	x	x	x			M	S		Two WildNet records. One Queensland Museum record, 1970. One Birds Australia record. Very occasional visitor to the Study Area.
Aves Monarchidae	<i>Monarcha melanopsis</i>	Black-faced Monarch	x	x	x			M	S		One WildNet record. One Queensland Museum record, 1977. Very occasional visitor to the Study Area.
Aves Petroicidae	<i>Melanodryas cucullata</i>	Hooded Robin <sup>3</sup>	x	x	x				C	x	34 WildNet records. One Birds Australia record. Two Queensland Museum records. Two BAAM survey records (2009) in the Condabri and Gilbert Gully tenements. Uncommon in the Study Area.
Aves Acrocephalidae	<i>Acrocephalus australis</i>	Australian Reed-Warbler	x	x	x			M	S		Seven WildNet records. 21 Birds Australia records. One Queensland Museum record. Uncommon in the Study Area due to a lack of waterbodies with suitable fringing vegetation.
Aves Estrildae	<i>Poephila cincta cincta</i>	Black-throated Finch (southern subspecies) <sup>3</sup>	x	x			x	E	E		One record, Broadbent (1885), also recorded in WildNet and Queensland Museum databases. Not expected to occur.
Aves Estrildae	<i>Neochmia ruficauda ruficauda</i>	Star Finch (eastern subspecies)			x			E	E		No actual database records, EPBC search only. Not expected to occur.
Aves Estrildae	<i>Stagonopleura guttata</i>	Diamond Firetail <sup>3</sup>	x	x	x				C	x	25 WildNet records. Four Birds Australia records. Three Queensland Museum records. Uncommon in the Study Area, having undergone decline.
Mammalia Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	Platypus	x						C	x	Two WildNet records. Very sparse in the Study Area.
Mammalia Dasyuridae	<i>Dasyurus hallucatus</i>	Northern Quoll			x			E	C		No actual database records, EPBC search only. Not expected to occur.

Class/Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2,3</sup>				Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
Mammalia Dasyuridae	<i>Dasyurus maculatus</i>	Spot-tailed Quoll <sup>3</sup>	x		x	x	x	E	V		One WildNet record of unknown date (pre-1975) and location. May be from outside the Study Area. Known to the north and east (McFarland <i>et al.</i> 1999a, b). Not expected to occur.	
Mammalia Dasyuridae	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	x						C	x	Four WildNet records. Difficult to record and possibly under-recorded from the Study Area.	Dry forest and woodlands with hollow-bearing trees and sparse ground cover (NPWS 2002). Most likely in ironbark woodland/open forest including REs 11.3.18, 11.3.39, 11.7.4, 11.7.7, 11.9.9, 11.10.1d.
Mammalia Dasyuridae	<i>Planigale tenuirostris</i>	Narrow-nosed Planigale	x	x					C	x	42 WildNet records. Two Queensland Museum records. Probably common in areas of suitable substrate in the Study Area.	A variety of habitats with cracking clay soils (Read 2008). Most likely in Land Zones 3, 4 and 9.
Mammalia Peramelidae	<i>Isodon macrourus</i>	Northern Brown Bandicoot	x	x					C	x	Five WildNet records. One Queensland Museum record. Very sparse in the Study Area.	Open forest, woodland and grassland with tall grass and dense shrub layer (Gordon 2008). In the Study Area it is most likely in riverine habitats such as RE 11.3.25.
Mammalia Peramelidae	<i>Perameles nasuta</i>	Long-nosed Bandicoot	x						C	x	Three WildNet records, all outside the Study Area. May not occur in the Study Area.	Prefers heath and forest habitats close to open grassy areas for feeding. Most abundant in areas that receive 750+ mm of annual rainfall (Dickman and Stodart 2008). In the Study Area would be likely only to occur in REs 11.8.3 and 11.9.4a.
Mammalia Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	x	x					C	x	100+ WildNet records. Four Queensland Museum records. Three BAAM survey records (2009) in Talinga and Condabri tenements. Sparse in the Study Area.	Feed almost entirely on eucalypts (Martin <i>et al.</i> 2008). In the Study Area most likely in REs 11.3.4, 11.3.25, 11.3.27b and 11.4.10 feeding on Forest Red Gum and River Red Gum.
Mammalia Vombatidae	<i>Lasiorhinus krefftii</i>	Northern Hairy-nosed Wombat <sup>3</sup>	x					E	E		One WildNet record, 1927, from outside the Study Area. Not expected to occur.	
Mammalia Petauridae	<i>Petaurus australis</i>	Yellow-bellied Glider <sup>3</sup>	x						C	x	43 WildNet records. One BAAM survey record (2009), a feed tree in Gilbert Gully tenement. Sparse in the Study Area.	Tall dry open eucalypt forest with large and numerous tree hollows (McFarland <i>et al.</i> 1999a, b). Most common in RE 11.10.1 but also occurs in REs 11.5.1, 11.5.4, 11.7.6 and 11.7.7 which contain Lemon-scented Spotted Gum, Ironbark and <i>Argophora</i> species and in alluvial areas.
Mammalia Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	x						C	x	21 WildNet records. Very sparse in the Study Area.	Dry sclerophyll forests and woodlands dominated by either winter-flowering eucalypts, with an understorey of gum-producing acacias and/or an understorey of winter and autumn flowering banksias (Smith and Murray 2003). Occurs in REs 11.3.4, 11.3.25, 11.3.27b and 11.10.1.
Mammalia Pseudocheiridae	<i>Petauroides volans</i>	Greater Glider	x	x					C	x	29 WildNet records. One Queensland Museum record. Common in the Study Area in suitable habitat.	A variety of eucalypt-dominated habitats, including tall forests and low woodlands with hollow-bearing trees (McKay 2008). In the Study Area most common in REs 11.3.3, 11.3.25 and 11.3.27b but may also occur in Land Zones 4, 5, 7, 9 and 10.
Mammalia Pseudocheiridae	<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	x						C	x	Five WildNet records. Known to the east of the Study Area (McFarland <i>et al.</i> 1999a, b). Very sparse in the Study Area.	A variety of vegetation types with shrubs that form dense foliage (McKay and Ong 2008). Likely only in 11.9.4a and 11.9.4b.
Mammalia Phalangeridae	<i>Trichosurus vulpecula</i>	Common Brushtail Possum	x	x					C	x	80 WildNet records. Seven Queensland Museum records. 13 BAAM survey records (2009) in Talinga, Condabri, Combabula, Ranyard, Carinya and Woleebee tenements. Common in the Study Area, though possibly declining.	Variety of habitats, but prefers dry eucalypt forests and woodlands (Kerle and How 2008).
Mammalia Potoroidae	<i>Aepyprymnus rufescens</i>	Rufous Bettong	x	x					C	x	45 WildNet records. One Queensland Museum record. Seven BAAM survey records (2009) in Combabula, Ranyard, Talinga, Carinya and Dalwogan tenements. Common in the Study Area.	Areas of sparse or grassy understorey in a variety of habitats, including eucalypt forests and low woodlands (Johnson 2003).
Mammalia Macropodidae	<i>Macropus dorsalis</i>	Black-striped Wallaby	x	x					C	x	71 WildNet records. Five Queensland Museum records. 10 BAAM survey records (2009) in Woleebee, Talinga, Carinya, Combabula and Gilbert Gully tenements. Common in the Study Area.	Forested areas with a dense shrub layer including rainforest margins, regrowth Brigalow scrub and Lantana thickets (Johnson 2008). Occurs in Land Zones 3, 4, 7, 9 and 10 but most frequently in REs 11.3.1, 11.4.3, 11.9.1, 11.9.4a, 11.9.4b, 11.9.5 and 11.9.10.
Mammalia Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox <sup>3</sup>	x		x	x	x	V	C		One WildNet record of unknown date and location (pre-1975), known to the east and north of the Study Area (McFarland <i>et al.</i> 1999a, b). Also known from the Taroom area (Craig Eddie pers. comm.). Known from the Chinchilla area (no details) (Hando and Hando 1997). The species is considered marginal within the Study Area.	In the study area Grey-headed Flying-fox is most likely to occur in areas of profusely flowering eucalypts, particularly on more fertile alluvial soils. The establishment of a camp is only likely within riparian vegetation.
Mammalia Megadermatidae	<i>Macroderma gigas</i>	Ghost Bat <sup>3</sup>	x				x		V		One WildNet record of unknown date and location (pre-1975), known to the north of the Study Area (McFarland <i>et al.</i> 1999a, b) and now restricted to tropical Australia (Churchill 2008). Not expected to occur.	

Class/Family	Species Name	Common Name	Source <sup>1</sup>				Management Status <sup>2,3</sup>				Likelihood of Occurrence/ Relevant Study Area Component(s) <sup>4</sup>	Key RE/Habitat Preference (for species known or considered possible occurrences within the Study Area)
			DERM	QM	BA	EPBC	LR <sup>5</sup>	EPBC Act	NC Act	BAMM		
Mammalia Vespertilionidae	<i>Chalinobus dwyeri</i>	Large-eared Pied Bat	x			x		V			One WildNet record (1997) in Gilbert Gully tenement. Roosting sites most likely to be associated with Gurdumundi State Forest and surrounding areas.	Little known, but may depend heavily on sandstone outcrops. It has been found roosting in disused mine shafts, caves, overhangs and disused Fairy Martin <i>Petrochelidon ariel</i> nests (Hoye and Schulz 2008). It also possibly roosts in the hollows of trees (Duncan <i>et al.</i> 1999). Possibly occurs in REs on sandstone, such as 11.10.1 and in areas of <i>Callitris</i> such as REs 11.3.14 and 11.3.18.
Mammalia Vespertilionidae	<i>Chalinobus nigrogriseus</i>	Hoary Wattled Bat	x						C	x	One WildNet record, 1997. Status in the Study Area is uncertain but it is considered an exceptionally common species (Kutt <i>et al.</i> 2008) that is commonly captured (Churchill 2008). This suggests the species is marginal, or absent, from the Study Area. Not expected to occur.	
Mammalia Vespertilionidae	<i>Chalinobus picatus</i>	Little Pied Bat	x	x					R		13 WildNet records, from Talinga, Kainama, Condabri and Ranyard tenements. One Queensland Museum record. Eight BAAM survey records (2009) in Condabri, Talinga, Woleabee, Ranyard and Combabula tenements. Golder Associates (2008) survey records from Talinga (probably included in WildNet). One survey record (Unidel Energy and Infrastructure 2009). Widespread at low densities in the Study Area.	Dry habitats including open forests, woodland, mulga woodlands, chenopod scrublands, <i>Callitris</i> forest, mallee and notophyll vine forest gullies (Eyre <i>et al.</i> 1997; Churchill 2008). Occurs in all Land Zones.
Mammalia Vespertilionidae	<i>Miniopterus australis</i>	Little Bentwing-bat	x						C	x	One WildNet record, 1998. The species is largely coastal in southern Queensland (Hoye and Hall 2008). Marginal, not expected to occur.	
Mammalia Vespertilionidae	<i>Miniopterus orfanae oceanensis</i> <sup>13</sup>	Eastern Bentwing Bat	x						C	x	Six WildNet records. Very sparse in the Study Area.	Variety of habitats including dry sclerophyll, open woodland and grasslands. Roost in caves, mines and culverts (Churchill 2008). Most likely in RE 11.10.1.
Mammalia Vespertilionidae	<i>Nyctophilus</i> sp. formerly <i>timoriensis</i> <sup>14</sup>	South-eastern Long-eared Bat	x	x		x	x	V			Six WildNet records, all 2001 or 2002 with records from Talinga and Condabri tenements. One Queensland Museum record. One survey record near Condamine (Unidel Energy and Infrastructure 2009). Very sparse in the Study Area.	Dry forest habitats including River Red Gum, open woodland, mallee, Brigalow and other arid and semi-arid habitats. It appears to be more common in box, ironbark and cypress-pine forests on sandy soils in southern Queensland (Churchill 2008; Turbill <i>et al.</i> 2008). May occur in all Land Zones.
Mammalia Vespertilionidae	<i>Vespadelus regulus</i>	Southern Forest Bat	x						C	x	One WildNet record. The Study Area is at the northern extreme of its distribution and its status within the Study Area is poorly known. Not expected to occur.	
Mammalia Muridae	<i>Pseudomys patritus</i>	Eastern Pebble-mouse	x				x		C	x	One WildNet record. One recent survey record (Unidel Energy and Infrastructure 2009). Expected to occur in suitable habitat, particularly in northern parts of the Study Area.	Ridges and hills with marble-sized pebbles for mound building, often within dry open woodlands with ironbark and bloodwood species (Ford 2008). Most likely in Land Zones 7 and 10.

<sup>1</sup> Source abbreviations as follows: **DERM** = Queensland's WildNet database; **QM** = Queensland Museum database; **BA** = Birds Australia database; **EPBC** = EPBC Online Protected Matters Search Tool; **LR** = Literature review. The one record may be included in multiple sources; e.g., the one Black-throated Finch record is listed in Broadbent (1985) and the WildNet and QM databases. A single record may be of multiple individuals.

<sup>2</sup> Status abbreviations are as follows: **CE** = Critically Endangered, **E** = Endangered, **V** = Vulnerable, **R** = Rare, **NT** = Near Threatened, **M** = Migratory, **S** = Special Concern Wildlife, **X** = non-EVR priority species for the BBS bioregion (EPA 2008).

<sup>3</sup> 'Back on Track' species [http://www.epa.qld.gov.au/nature\\_conservation/wildlife/back\\_on\\_track\\_species\\_prioritisation\\_framework/](http://www.epa.qld.gov.au/nature_conservation/wildlife/back_on_track_species_prioritisation_framework/)

<sup>4</sup> Based on cross referencing habitat/RE preference with refined mapping (**Appendix I**) and accounting for species' known distribution within Study Area as well as consideration of detectability on the number of previous records of each species.

<sup>5</sup> Based on Broadbent (1985); Eddie (2008); Golder Associates (2008); Hines *et al.* (2000); McFarland *et al.* (1999a, b); Unidel Energy and Infrastructure (2009); URS (2009).

<sup>6</sup> Undescribed species, description will be published in 2010 in Stanistic *et al.* (in preparation).

<sup>7</sup> Undescribed species, alpha-numeric code is as cited in Queensland Museum database.

<sup>8</sup> Currently under submission to DEWHA for listing under the EPBC Act as Endangered.

<sup>9</sup> Currently under submission to DEWHA for listing under the EPBC Act as Critically Endangered.

<sup>10</sup> Lake Broadwater is outside the Study Area but within the database search area.

<sup>11</sup> Listed as Migratory under the EPBC Act 1999 as Painted Snipe *Rostratula benghalensis* s. lat.

<sup>12</sup> Listed as Migratory under the EPBC Act 1999 as *Xanthomyza phrygia*.

<sup>13</sup> Listed in the Australian Faunal Directory as Eastern Bent-wing Bat *Miniopterus schreibersii oceanensis*

<sup>14</sup> Very recently described as *Nyctophilus corbeni* (Parnaby 2009).

## REFERENCES

- Blakers, M, Davies, SJJ F and Reilly, PN (1984).** *The atlas of Australian birds.* Melbourne University Press, Melbourne.
- Braby, MF (2000).** *The butterflies of Australia: their identification, biology and distribution.* CSIRO Publishing, Collingwood.
- Braby, MF (2004).** *The complete field guide to butterflies of Australia.* CSIRO Publishing, Collingwood.
- Broadbent, K (1885).** 'The birds of the Chinchilla District.' *Proceedings of the Royal Society of Queensland*, **2**: 117-126.
- Churchill, S (2008).** *Australian bats.* Second edition. Allen & Unwin, Crows Nest.
- Cogger, HG (2000).** *Reptiles and amphibians of Australia.* Reed New Holland, Sydney.
- Cogger, HG, Cameron, EE, Sadlier, RA and Egger, P (1993).** *The action plan for Australian reptiles.* Australian Nature Conservation Agency, Canberra.
- Crome, F and Shields, J (1992).** *Parrots and pigeons of Australia: the National Photographic Index of Australian Wildlife.* Angus and Robertson, Pymble.
- Debus, S (1998).** *The birds of prey of Australia: A field guide.* Oxford University Press, Melbourne.
- Dickman, CR and Stodart, E (2008).** 'Long-nosed Bandicoot.' In: S Van Dyck and R Strahan (eds.), *The Mammals of Australia.* Third Edition. Reed New Holland, Sydney. pp. 189-190.
- Drury, W (2001).** 'Reptiles under threat in Queensland's Southern Brigalow Belt.' World Wide Fund for Nature, Brisbane.
- Duncan, A, Barker, GB and Montgomery, N (1999).** *The action plan for Australian bats.* Environment Australia, Canberra.
- Eastwood, R, Braby, MF, Schmidt, DJ and Hughes, JM (2008).** 'Taxonomy, ecology, genetics and conservation status of the pale imperial hairstreak (*Jalmenus eubulus*) (Lepidoptera: Lycaenidae): a threatened butterfly from the Brigalow Belt, Australia.' *Invertebrate Systematics*, **22**: 407-423.
- Eddie, C (2007).** *Field guide to trees and shrubs of eastern Queensland oil and gas fields.* Santos Ltd, Adelaide.
- Eddie, C (2008).** 'Fauna and flora of 'Rockwood', Talinga Development Area, southern inland Queensland: historical summary.' Report to Origin Energy and Golder Associates, BOOBOOK Wildlife Consulting, Roma.
- Ehmann, H (1992).** *Encyclopedia of Australian animals: Reptiles.* Angus and Robertson, Sydney.
- EPA (2003).** 'BPA BRB South Fauna Expert Panel in Brigalow Belt South Biodiversity Planning Assessment.' Environmental Protection Agency, Brisbane.
- EPA (2008).** 'Brigalow Belt South Fauna Expert Panel Report.' Environmental Protection Agency, Brisbane. Revised and updated June 2008.
- Eyre, T, Barrett, D and Venz, M (1997).** 'Systematic vertebrate fauna survey project, stage 1 – vertebrate fauna survey in the SEQ bioregion.' Department of Natural Resources, Brisbane.
- Frith, HJ (1982).** *Pigeons and doves of Australia.* Rigby, Adelaide.
- Geering, A, Agnew, L and Harding, S (2007).** *Shorebirds of Australia.* CSIRO Publishing, Collingwood.
- Golder Associates Pty Ltd (2008).** 'Report on Ecological Survey. Talinga Development Project Area within Petroleum lease (PL) 226.' Chinchilla, Queensland. Report prepared for Origin Energy.



- Gordon, G (2008).** 'Northern Brown Bandicoot.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 178-180.
- Hando, R and Hando, V (1997).** *Going bush with Chinchilla Nats*. Second Edition. Chinchilla Field Naturalist's Club Inc., Chinchilla.
- Higgins, PJ (ed.) (1999).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 4: Parrots to dollarbird*. Oxford University Press, Melbourne.
- Higgins, PJ and Davies, SJ (eds.) (1996).** *Handbook of Australian, New Zealand & Antarctic birds, Volume 3, Snipe to pigeons*. Oxford University Press, Melbourne.
- Higgins, PJ and Peter, JM (eds.) (2002).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 6: Pardalotes to shrike-thrushes*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006a).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 7, Boatbills to starlings, Part A, boatbill to larks*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006b).** *Handbook of Australian, New Zealand & Antarctic Birds Volume 7, Boatbills to starlings, Part B, dunnock to starlings*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Steele, WK (eds.) (2001).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 5: Tyrant-flycatchers to chats*. Oxford University Press, Melbourne.
- Hines, BM, Hannah D, Venz, M and Eyre, T (2000).** 'New distribution and habitat data for the vulnerable pygopodid, *Delma torquata* (Kluge 1974).' *Memoirs of the Queensland Museum*, **45**: 391-393.
- Hoye, GA and Hall, LS (2008).** 'Little Bent-winged Bat.' In S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 503-504.
- Hoye, GA and Schulz, M (2008).** 'Large-eared Pied Bat.' In S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 531-532.
- Johnson, PM (2003).** *Kangaroos of Queensland*. Queensland Museum, South Brisbane.
- Johnson, PM (2008).** 'Black-striped Wallaby.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 329-330.
- Kerle, JA and How, RA (2008).** 'Common Brushtail Possum.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 274-276.
- Kutt, AS, Hannah, DS and Thurgate, NY (2003).** 'Distribution, habitat and conservation status of *Paradelma orientalis* Gunther 1876 (Lacertilia: Pygopodidae).' *Australian Zoologist*, **32**: 61-264.
- Kutt, AS, Milne, DJ and Allison, FR (2008).** 'Hoary Wattled Bat.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 537-538.
- Low, T (1995).** 'The animals of Brisbane: A vertebrate status review.' Unpublished report prepared for Brisbane City Council.
- Marchant, S and Higgins, PJ (eds.) (1990).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 1, Ratites to ducks, Part B Australian Pelican to ducks*. Oxford University Press, Melbourne.
- Marchant, S and Higgins, PJ (eds.) (1993).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 2, Raptors to lapwings*. Oxford University Press, Melbourne.



- Martin, RW, Handasyde, KA and Krockenberger, A (2008).** 'Koala.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 198-201.
- McFarland, D, Haseler, M, Venz, M, Reis, T, Ford, G and Hines, B (1999).** 'Terrestrial vertebrate fauna of the Brigalow Belt South Bioregion: Assessment and analysis for conservation planning.' Queensland Environmental Protection Agency, Brisbane.
- McFarland, D, Venz, M and Reis, T (1999).** 'Priority species summaries. An attachment to the report: Terrestrial vertebrate fauna of the Brigalow Belt South Bioregion: Assessment and analysis for conservation planning.' Queensland Environmental Protection Agency, Brisbane.
- McKay, GM (2008).** 'Greater Glider.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 240-242.
- McKay, GM and Ong, P (2008).** 'Common Ringtail Possum.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 255-257.
- Menkhorst, PW and Knight, F (2004).** *A field guide to the mammals of Australia*. Oxford University Press, Melbourne.
- NPWS (2002).** *Threatened species of the upper north coast of New South Wales: fauna*. NSW Parks and Wildlife Service, Coffs Harbour.
- NPWS (2003).** *Threatened Species of the New England Tablelands and north west slopes of New South Wales*. NSW Parks and Wildlife Service, Coffs Harbour.
- Oliver, DL, Chambers, MA and Parker, DG (2003).** 'Habitat and resource selection of the painted honeyeater (*Grantiella picta*) on the northern floodplains region of New South Wales.' *Emu*, **103**: 171-176.
- Olsen, P (1998).** 'Australia's raptors: diurnal birds of prey and owls.' *Wingspan*, **8**: supplement I-XVI.
- Parnaby, HE (2009).** 'A taxonomic review of Australian greater long-eared bats previously known as *Nyctophilus timoriensis* (Chiroptera: Vespertilionidae) and some associated taxa.' *Australian Zoologist*, **35**: 39-81.
- Pizzey, G and Knight, F (2003).** *The field guide to the birds of Australia*. HarperCollins, Sydney.
- Pringle, JD (1985).** *The waterbirds of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, North Ryde.
- Pringle, JD (1987).** *The shorebirds of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, North Ryde.
- Read, DG (2008).** 'Narrow-nosed Planigale.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 114-116.
- Richardson, R (2006).** 'Queensland Brigalow Belt Reptile Recovery Plan.' Report to the Department of the Environment, Water, Heritage and the Arts, Canberra. WWF-Australia, Brisbane.
- Schulz, M and Eyre, TJ (1997).** 'New distribution and habitat data for the pygopodid, *Paradelma orientalis* (Gunther 1876).' *Memoirs of the Queensland Museum*, **42**: 12.
- Shea, GM (1987).** 'Notes on the biology of *Paradelma orientalis*.' *Herpetofauna*, **17**: 6.
- Smith, AP and Murray, M (2003).** 'Habitat requirements of the squirrel glider (*Petaurus norfolcensis*) and associated possums and gliders on the New South Wales central coast.' *Wildlife Research*, **30**: 291-301.
- Stanisic, J, Shea, M, Potter, D and Griffiths, O (in preparation).** *Australian land snails*:

Volume 1. *A field guide to eastern Australian species*. Publisher unknown, Singapore.

**Turbill, C, Lumsden, LF and Ford, GI (2008).**  
'South-eastern & Tasmanian Long-eared Bats.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 527-528.

**Unidel Energy and Infrastructure, (2009).**  
'Queensland Curtis LNG Project (upstream component) draft flora and fauna assessment.' Report prepared for Queensland Curtis LNG.

**URS, (2009).** 'Final report Santos GLNG CSG field report – nature conservation.' Report prepared for Santos Ltd.

**Wilson, S (2005).** *A field guide to reptiles of Queensland*. Reed New Holland, Sydney.

**Wilson, S and Swan, G (2008).** *A complete guide to reptiles of Australia*. Second Edition. New Holland, Sydney.

## **Appendix K:**

### **Significant Terrestrial Flora Species Profiles**

# APPENDIX K

## SIGNIFICANT FLORA SPECIES PROFILES

### TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT REPORT – GAS FIELDS COMPONENT AUSTRALIA PACIFIC LNG PROJECT EIS

#### *Table of contents*

CHINCHILLA WATTLE <i>ACACIA CHINCHILLENSIS</i> .....	1
CURLY-BARKED WATTLE <i>ACACIA CURRANII</i> .....	1
TARA WATTLE <i>ACACIA LAUTA</i> .....	1
MYALL <i>ACACIA MELVILLEI</i> .....	2
BOWYAKKA WATTLE <i>ACACIA MICROSPERMA</i> .....	2
YARRAN WATTLE <i>ACACIA OMALOPHYLLA</i> .....	2
WESTERN ROSEWOOD ( <i>ACACIA SPANIA</i> ) .....	3
SCRUB WATTLE <i>ACACIA TENUINERVIS</i> .....	3
WARDELL'S WATTLE <i>ACACIA WARDELLII</i> .....	3
OOLINE <i>CADELLIA PENTASTYLIS</i> .....	4
GURULMUNDI FRINGE MYRTLE <i>CALYTRIX GURULMUNDENSIS</i> .....	4
SILKY CRYPTANDRA <i>CRYPTANDRA CILIATA</i> .....	5
BRIGHT FLAT-SEDGE <i>CYPERUS CLARUS</i> .....	5
PINK DONKEY-ORCHID <i>DIURIS TRICOLOR</i> .....	5
BLAKE'S SPIKERUSH <i>ELEOCHARIS BLAKEANA</i> .....	6
PLUNKETT MALLEE <i>EUCALYPTUS CURTISII</i> .....	6
DIAMOND-LEAVED IRONBARK <i>EUCALYPTUS RHOMBICA</i> .....	7
SHINY-LEAVED GREY IRONBARK <i>EUCALYPTUS SUFFULGENS</i> .....	7
SHINY-LEAVED IRONBARK <i>EUCALYPTUS VIRENS</i> .....	7
GREEN MALLEE <i>EUCALYPTUS VIRIDIS</i> .....	8
WANDERING FRINGE-RUSH <i>FIMBRISTYLIS VAGANS</i> .....	8
GONOCARPUS <i>GONOCARPUS URCEOLATUS</i> .....	9
BELSON'S PANIC GRASS <i>HOMOPHOLIS BELSONII</i> .....	9
CENTRAL QUEENSLAND ZAMIA PALM <i>MACROZAMIA FEARNSIDEI</i> .....	10
SWAMP TEA-TREE <i>MELALEUCA IRBYANA</i> .....	10
MICROCARPAEA <i>MICROCARPAEA AGONIS</i> .....	10
GURULMUNDI HEATH-MYRTLE <i>MICROMYRTUS CARINATA</i> .....	11
WAXFLOWER <i>PHILOTHECA SPORADICA</i> .....	11
PLAINS PICRIS <i>PICRIS BARBARORUM</i> .....	11
DUNMORE MINT-BUSH <i>PROSTANTHERA SP. DUNMORE D.M.GORDON 8A</i> .....	12

COBAR GREENHOOD ORCHID <i>PTEROSTYLIS COBARENSIS</i> .....	12
RED-SOIL WOOLLY WRINKLEWORT <i>RUTIDOSIS LANATA</i> .....	12
REFERENCES AND INFORMATION SOURCES .....	13



## **Chinchilla Wattle *Acacia chinchillensis***

*Vulnerable* (Australia)  
*Near Threatened* (Queensland)

Multi-stemmed shrub to 2m tall with smooth, grey-brown to yellow-brown bark and hairy branchlets. Leaves are bipinnate with 2-4 pairs of narrowly oblanceolate, silvery, leathery leaflets to 7mm long and 1mm wide. It has golden to yellow, globular flowerheads that are held in racemes in the leaf axils and on the ends of branches and curved, leathery, brownish black seed pods to 10cm long and 7mm wide. Flowers appear in late winter to early spring whilst seed pods have been recorded mid spring to early summer (DNR 1999; Maslin 2001).

More than 20 populations of Chinchilla wattle have been recorded over a 200km range in open forests dominated by ironbark, box and cypress pines in the Chinchilla region of the Darling Downs in southern Queensland. The Chinchilla wattle occurs on gently undulating plains with deep loamy to sandy loam soils often with poor drainage and low nutrient levels to 340-380m altitude and populations have been recorded in the Barakula, Dunmore and Braemar State Forests with an estimated total population size of 103,000 individuals.

This species is under threat from destruction of habitat by clearing and inappropriate fire regimes (DEWHA 2010; DNR 1999; Maslin 2001).

## **Curly-barked Wattle *Acacia curranii***

*Vulnerable* (Australia)  
*Vulnerable* (Queensland)

Broom-like, multi-stemmed shrub to 4m tall with distinctively red, curling bark (minnirichi) and long angular, hairy maroon-grey branches and straight, hairy phyllodes (modified leaves) to 18cm long and 1.5mm wide. Golden yellow flower spikes to 7mm long appear on short stalks in late winter to early spring with hairy, oblong, greyish-brown seed pods to 3mm long forming mid spring (Maslin 2001).

The curly-barked wattle is restricted to Gurulmundi in southern Queensland and Shepherds Hill and Kilparney in central New South Wales, where it is found in dry sclerophyll forests and semi-arid woodlands on rocky outcrops of isolated hills and ranges on skeletal soils. This species is under threat from grazing and habitat destruction by feral animals, clearing during fire trail widening, quarrying, insect seed predation and inappropriate fire regimes (DEWHA 2010; Maslin 2001).

## **Tara Wattle *Acacia lauta***

*Vulnerable* (Australia)  
*Vulnerable* (Queensland)

Sprawling shrub to 2m tall with yellowish, angular branches and straight to somewhat incurved and flat phyllodes (modified leaves to 4cm long and 2.5mm wide. Phyllodes have sharply pointed tips and raised midribs and are held on hairy stalks. Flowerheads appear in the leaf axils in late winter to early spring with linear seed pods to 6cm long and 4mm wide produced in early summer (Maslin 2001).

The Tara wattle is restricted to open woodlands in sandy soils in the Inglewood-Tara region of southern Queensland with an estimated total population size of more than 2000 individuals. This species is not protected in any conservation reserve and is under threat from restricted distribution leading to inbreeding, inappropriate fire regimes and road widening and maintenance activities (DEWHA 2010; Maslin 2001).

### **Myall *Acacia melvillei***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Tree to 15m tall with glabrous branchlets and phyllodes (modified leaves) are ascending and narrowly elliptic to oblong to 10.5cm long and 15mm wide. Flowerheads are golden and globular to 8mm diameter and are held in 1-5-flowered racemes. Seed pods are oblong and leathery and are slightly raised over the seeds to 9cm long and 15mm wide (Maslin 2001).

Myall is restricted to mixed open woodlands and woodlands, in loam, clay and sandy soils on sandhills and undulating sand plains from south-eastern Queensland to northern Victoria. This species is under threat by clearing, overgrazing and weed invasion and it is not known if this species occurs in any protected reserves (EPA 2002; Maslin 2001; NSW Scientific Committee 2008).

### **Bowyakka Wattle *Acacia microsperma***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

The bowyakka wattle has linear, green to grey-green phyllodes (modified leaves) to 14cm long and 4mm wide and grows to 10m tall. Golden flowerheads to 5.5mm diameter are borne in 1-4-flowered racemes in the leaf axils in late winter to late spring and leathery seed pods to 6cm long and 2mm wide are produced shortly after (Maslin 2001).

The bowyakka wattle is found in shallow loamy and clay soils over weathered rock in monotypic stands or as a co-dominant in gidgee (*Acacia cambagei*) and mountain yapunyah (*Eucalyptus thozetiana*) woodlands. It is not known to any protected reserve (EPA 2002; Maslin 2001; Santos 2007).

### **Yarran Wattle *Acacia omalophylla***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Tree to 10m tall with narrowly-elliptic to oblong, leathery, curved phyllodes (modified leaves) to 11cm long and 9mm wide. Golden globular flowerheads are borne in mid winter to mid spring, in 2-3 flowered racemes and linear, leathery, longitudinally nerved seed pods to 9cm long and 5mm wide are produced thereafter (Maslin 2001).

The Yarran wattle is found in belah (*Casuarina cristata*) communities in brown soils with calcareous nodules and poplar box (*Eucalyptus populnea*) open woodlands in red earths, from central southern Queensland to Victoria (EPA 2002; Maslin 2001; Santos 2007). It is not known if this species occurs in any protected reserve.

## **Western Rosewood (*Acacia spania*)**

Rare (Queensland)

Single-stemmed, glabrous tree to 15m tall with hard, persistent bark (ironbark) and light brown, angular, scurfy branchlets. Phyllodes (modified leaves) are narrowly elliptic to elliptic, flat, leathery, stiff and scurfy to 4.5cm long and 18mm wide with inconspicuous veins. Yellow flower spikes to 4cm long appear in late winter and fruit pods are produced from spring to summer (Maslin 2001).

Western rosewood is restricted to the Emerald district in central Queensland where it is found in monotypic stands surrounded by open eucalypt woodlands in shallow red soils. Two populations have been recorded at Fairhill approximately 56-70km north-east of Emerald although total population size is unknown. This species is not known to any protected estate and threats have been identified as vegetation clearing and disturbance (Maslin 2001).

## **Scrub Wattle *Acacia tenuinervis***

Rare (Queensland)

Scrub wattle grows to 9 m tall, often with root suckers and is characterised by grey-brown, furrowed bark and orange-red to red-brown, pruinose branchlets. Juvenile foliage is velvety. Phyllodes (modified leaves) are very narrowly elliptic to narrowly elliptic, straight to falcate and glabrous to slightly scurfy to 12.5cm long and 30mm wide with 3-5 slightly prominent, parallel, anastomosing nerves and 1 large, basal gland. Golden flowers to 1.5mm long are borne in long racemes in the leaf axils from late winter to early spring and seed pods are linear, chartaceous and scurfy and are slightly constricted and raised over the seed to 11cm long and 4mm wide (Maslin 2001).

This species prefers eucalypt scrubs and forests in association with tumble-down Ironbark (*Eucalyptus panda*), narrow-leaved red ironbark (*E. crebra*) and poplar box (*E. populnea*) in red earths and ironstone gravels, in the Glenmorgan-Injune-Monto region of south-eastern Queensland. It has also been recorded in monotypic stands on ridges and roadsides and in vegetation containing brigalow (*Acacia harpophylla*) (DNR 1999).

Little is known about the total population size and extent of occurrence of this species and it is not known to any protected reserve. Scrub wattle is under threat by destruction of habitat by clearing, disturbance of habitat by timber harvesting, inappropriate fire regimes and inappropriate grazing regimes (DNR 1999).

## **Wardell's Wattle *Acacia wardellii***

Vulnerable (Australia)

Vulnerable (Queensland)

Slender shrub or tree to 7m tall with smooth, silvery grey to white bark and pruinose, glabrous branchlets. Phyllodes (modified leaves) are narrowly elliptic, falcately recurved and glabrous to 17.5cm long and 3cm wide with 2 prominent nerves and a third lesser nerve and 1-3 additional glands often on triangular projections. Pale yellow, globular flowerheads are borne on racemes to 4.5cm long early to mid winter, with leathery, glabrous seed pods to 12cm long and 6mm wide appearing mid to late spring (DEWHA 2010; Maslin 2001).

Wardell's wattle is not known to any protected estate and is under threat from loss or degradation of habitat areas and inappropriate fire regimes. It is restricted to eucalypt woodlands in gravelly soils on shallow weathered sandstone, south of Roma, south-west of Chinchilla and in the Thomby Range, near Surat in south-eastern Queensland (DEWHA 2010).

### **Ooline *Cadellia pentastylis***

*Vulnerable* (Australia)

*Vulnerable* (Queensland)

*Back on Track Species (Critical)* (Queensland)

*Vulnerable* (New South Wales)

Tree to 28m tall with dark, hard, scaly bark and hairless, simple, ovate to obovate leaves to 6.5cm long and 4cm wide with prominent venation. Leaves are glossy above and dull and paler below and shortly stalked. White flowers to 6mm long appear from mid spring to early summer in Queensland and mid to late spring in New South Wales, with egg-shaped, brownish, wrinkled and slightly compressed fruit to 5mm long and 3mm diameter produced from late spring to early summer. Fruit is enclosed by an enlarged, spreading, red, papery calyx with 5 lobes (DEC 2010; DNR 1999).

Ooline is known to several protected areas including the Carnarvon, Sundown and Tregole National Parks and Stones Country Resource Reserve although total population size and extent of occurrence are unknown. This species occurs in semi-evergreen vine thickets in association bitter bark (*Alstonia constricta*), hard alectryon (*Alectryon subdentatus*), leopard ash (*Flindersia collina*), wilga (*Geijera parviflora*) and narrow-leaved bottle tree (*Brachychiton rupestris*) on sandstone and basalt slopes and currawong (*Acacia sparsiflora*), brigalow (*A. harpophylla*) and belah (*Casuarina cristata*) communities on undulating clay plains and low hills at 200-500m altitude, from Narrabri in northern New South Wales to Rannes in central Queensland (DEWHA 2010; DNR 1999).

Ooline is under threat from broadscale tree clearing, soil compaction by domestic stock and feral goats, risk of local extinction due to small, scattered remnants and inappropriate fire and grazing regimes (DEWHA 2010).

### **Gurulmundi Fringe myrtle *Calytrix gurulmundensis***

*Vulnerable* (Australia)

*Vulnerable* (Queensland)

The Gurulmundi fringe myrtle grows to 2 m tall and is characterised by linear to narrowly elliptic, aromatic leaves to 11mm long and 1mm wide which are held crowded and spirally along the branches. Star-like, cream and yellow flowers to 11mm long and 3mm wide are borne in terminal clusters from mid winter to mid spring (DNR 1999).

Restricted to the Gurulmundi-Guluguba-Barakula area in south-eastern Queensland, this species is found in open scrublands with sparse stunted *Eucalyptus*, *Acacia* and *Casuarina* species on ridge tops and *Triodia* hummock grasslands with scattered shrubs. The Gurulmundi fringe myrtle has an estimate total population area of less than 100km and is not conserved in any protected estate. This species is under threat from vegetation clearing, increasing fragmentation and loss of remnants, changed fire regimes, quarrying and inappropriate timber harvesting (DEWHA 2010; DNR 1999).

## **Silky Cryptandra *Cryptandra ciliata***

*delisted in 2009 (previously considered Rare) (Queensland)*  
*Poorly known (> 100km geographical range) (CSIRO R&T Australian Plants List)*

Shrub to 0.5m tall with lateral branchlets to 15mm long that lack terminal spines. Branchlets are hairy becoming glabrous with age. Leaves are green and glabrous above and white and hairy below and are terete and linear to 2.6mm long and 0.5mm wide with strongly rolled margins. Silky cryptandra flowers and fruits from mid winter to early september. Flowers are white to brown and tubular with hairy lobes to 2.0mm long and fruit capsules are ellipsoidal to 2.9mm long (bean 2004; DNR 1999).

Restricted to the Barakula-Theodore region of south-eastern Queensland, the silky cryptandra is found in lemon-scented/spotted gum (*Corymbia citriodora*) and narrow-leaved red ironbark (*Eucalyptus crebra*) dominated woodlands with tall *Acacia* spp. understorey on lateritic duricrusts and eucalypt woodlands on rocky and sandy loam soils and lancewood (*Acacia shirleyi*) scrublands and forests and *Triodia* grasslands. Little is known about the total population size and extent of occurrence of this species with representation populations recorded in the Barakula State Forest. Silky cryptandra is not known to any protected reserve and is under threat from destruction of habitat due to clearing and habitat disturbance (Bean 2004; DNR 1999).

## **Bright Flat-sedge *Cyperus clarus***

*Vulnerable (Queensland)*

Slender, tufted sedge to 80cm tall with triquetrous to trigonous, smooth to scabrous stems to 2.5mm diameter. Leaves are septate-nodulose and shorter than the stems. Inflorescences are simple and 3-6-branched to 10cm long and are held in dense clusters to 35mm diameter. They have leaf-like involucral bracts, flattened spikelets to 18mm long and 4.5 mm wide and acute, golden brown to brown glumes to 4mm long. Inflorescences appear from spring to summer (Botanic Gardens Trust 2010).

Bright flat-sedge prefers grasslands and open woodlands in heavy basalt-derived soils in south-eastern Queensland and north-eastern New South Wales. Little is known about the total population size and extent of occurrence for this species including its representation in protected reserves (Botanic Gardens Trust 2010).

## **Pink Donkey-orchid *Diuris tricolor***

*Vulnerable (Australia)*  
*Vulnerable (New South Wales)*

Terrestrial herb to 40cm tall with 1-3, linear leaves to 30cm long and 4mm wide. Flowers are bright yellow to orange and speckled with red to purple and white markings to 3cm long and appear on racemes to 40cm long (2-6-flowered) in spring (DEC 2010).

The pink donkey-orchid is restricted to coastal ranges eastern Australia, from south-east Queensland to the New South Wales-Victoria border, where it is found in sclerophyll forests and ironbark-acacia shrublands in association with white cypress pine (*Callitris glaucophylla*), poplar box (*Eucalyptus populnea*), gum coolibah (*Eucalyptus intertexta*) and often with a grassy to herbaceous understorey, in sandy soils on flats and small rises and sometimes red earths (DEC 2010; DEWHA 2010).



Little is known about the total population size and extent of occurrence of this species including its representation in protected reserves. Threats have been identified as habitat clearing and modification, feral animals, weed competition and illegal collection (DEWHA 2010).

### **Blake's Spikerush *Eleocharis blakeana***

*Rare (Queensland)*

Densely tufted perennial sedge with numerous erect, green, cylindrical stems to 50cm tall and 1mm wide. Leaves are reduced to narrow cylindrical, reddish-brown to purplish sheaths with truncated tips surrounding the base of stems. Flowers are borne from early autumn to mid spring in dense terminal clusters to 20cm long and have spirally arranged, pale brown to red-brown, ovate to lanceolate glumes to 3mm long. Fruit nuts are shiny, yellowish to golden brown and obovate to 1.2mm long and 1mm wide and are surrounded by 6-8 appressed bristles, a quarter of to a third the length of the nut (DNR 1999).

Restricted to southern Queensland and northern New South Wales, Blake's spikerush prefers ephemeral wet habitats in melon hole country in brigalow (*Acacia harpophylla*) and belah (*Casuarina cristata*) scrub communities on plains and low undulating country, and in small depressions along drainage lines in poplar box (*Eucalyptus populnea*) and Moreton Bay ash (*Corymbia tessellaris*) open forests and woodlands. This species has also been recorded along roadside channels and in paddocks (DNR 1999).

Blake's spikerush protected in the Lake Broadwater Conservation Park however is under threat from disturbance of habitat by timber harvesting and clearing and modification of drainage patterns (DNR 1999).

### **Plunkett Mallee *Eucalyptus curtisii***

*Rare (Queensland)*

Plunkett mallee is a spreading mallee or small tree (forming lignotubers) to 7m tall with smooth, grey to silvery bark that sheds in short curly brown flakes and slender, non-glaucous branchlets which lack oil glands in the pith. Juvenile stems are square to rounded in cross-section and glabrous and juvenile leaves are opposite becoming sub-opposite to alternate, stalked, linear to narrowly lanceolate, discolourous and darker green above to 6.2cm long and 0.6cm wide. Adult leaves are alternate (sometimes opposite), lanceolate to falcate, flat, strikingly discolourous, glossy and green to 14.5cm long and 3.3cm wide. Flowers are white and held in 7-flowered umbels on stalks to 0.5cm long, in terminal panicles on slightly angular inflorescence stalks to 1.7cm long. Flowers appear from early spring to early summer. Nuts are copular to truncate-globose to 1.1cm long and 1.1cm wide with descending, narrow, dehiscence circumscissile discs and are produced from late winter to late summer (Slee et al 2006).

Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains, this species is found in monotypic stands of mallee growth in shrublands dominated by banksias and sometimes in association with swamp stringybark (*Eucalyptus conglomerata*), in poorly drained lowland areas, and in scattered distribution in more open parts of mixed eucalypt forests dominated by spotted gum (*Corymbia maculata*), brown bloodwood (*C. trachyphloia*) and black cypress pine (*Callitris endlicheri*) or broad-leaved red ironbark (*E. fibrosa*), needlebark (*E. planchoniana*) and yellow stringybark (*E. acmenoides*), in better drained soils. Plunkett mallee grows in sandy podosols with impeded drainage, shallow stony soils, clay loams and

stony clays with a surface layer of loose stones, on low ridges and up to 457m altitude (DNR 1999; Slee et al 2006).

Plunkett mallee is under threat from destruction of habitat due to clearing, disturbance of habitat by timber harvesting, inappropriate grazing regimes, inappropriate fire regimes and inappropriate legal collection practices. It has been recorded in the Barakula State Forest however is not known to any conservation reserve (DNR 1999).

### **Diamond-leaved Ironbark *Eucalyptus rhombica***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Small to medium sized tree to 20m tall with grey to black, persistent (ironbark) and somewhat flaky bark, becoming smooth on small, outer branches. Juvenile leaves are opposite, bluish-green and paired (4-5) and adult leaves are alternate, lanceolate to falcate, concolorous, dull and grey-green to 15cm long and 3.5cm wide. Flowerbuds are rhomboidal to 1.4cm long and 0.6cm wide with scar present and conical to pyramidal operculum and are held in 7-flowered umbels on stalks to 1cm long. Flowers are white and appear from late summer to late spring. Nuts are obconical and slightly 4-angled at the base to 1cm long and 1cm wide and often have wide, vertical inner operculum scar and descending discs. Fruit have 3-5 valves at rim level and are held on stalks to 0.9cm long (Brooker and Kleinig 1994).

Restricted to south-eastern Queensland where it is known from three areas including Leyburn-Cecil Plains-Millmerran area west of Toowoomba, Binjour Plateau State Forest near Gayndah and west of Taroom, in forests and woodlands on sandstone ridges and low sandy ridges (Slee et al 2006).

### **Shiny-leaved Grey Ironbark *Eucalyptus suffulgens***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Tree to 25m tall forming lignotuber with dark grey to black, persistent (ironbark) bark on trunk and larger branches, becoming smooth on smaller, upper branches. Juvenile leaves are opposite becoming alternate, glossy green, lanceolate and sessile or shortly stalked to 13cm long and 2.5cm wide. Adult leaves are alternate, lanceolate, concolorous to slightly discolourous, glossy and green to 16cm long and 2.5cm wide. Flowerbuds are obovoid to pyriform to 1cm long and 0.5cm wide with conical to rarely slightly beaked operculum, narrower, shorter hypanthium and inflexed stamens. Flowers are white and appear from mid autumn to early spring. Nuts are barrel-shaped to 1.3cm long and 1cm wide with descending discs and 4-5 enclosed valves (Brooker and Kleinig 1994; Slee et al 2006).

Endemic to southern Queensland, the shiny-leaved grey ironbark prefers forests and woodlands on hills and ranges and it is not known if this species occurs in any protected reserve (Slee et al 2006).

### **Shiny-leaved Ironbark *Eucalyptus virens***

*Vulnerable* (Australia)

*Vulnerable* (Queensland)

Tree forming lignotuber to 25m tall with persistent, grey to black and often somewhat soft and flaky bark to the small branches. Juvenile leaves are stalked, opposite becoming alternate, lanceolate and glossy green to 7cm long and 1.6cm wide and adult leaves are alternate, narrowly lanceolate, concolourous and glossy green to 11cm long and 2cm wide. Flowerbuds are ovoid to 0.6cm long and 0.5cm wide with conical to rounded operculum and scar present. Flowers are white and appear in 7-flowered umbels in late summer. Fruit are hemispherical to 0.6cm long and 0.7cm wide with descending discs and 4-5 valves at rim level or enclosed (Brooker and Kleinig 1994; Slee et al 2006).

Restricted to four disjunct localities near Mt Moffatt in the Carnarvon area, Brovinia area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland, this species is found in woodlands dominated by Queensland peppermint (*Eucalyptus exserta*), the apple, *Angophora costata*, Tom Russell's mahogany (*Lysicarpus ternifolius*) and woolly she-oak (*Allocasuarina inophloia*), in coarse sandy, skeletal soils on outcropping sandstone escarpments; forests dominated by buloke (*Allocasuarina leuhmannii*) and mugga ironbark (*E. sideroxylon*) in shallow, grey sandy soils on flat lands; and woodlands dominated by similar species, in coarse white sandy soils over sandstone on undulating lands. Four populations have been recorded over a 500 km distribution range although total population size is unknown. This species is not known to any protected reserve (Brooker and Kleinig 1994; Slee et al 2006).

### **Green Mallee *Eucalyptus viridis***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Mallee or tree to 8m tall forming lignotuber with rough, dark grey and box-type bark on lower stems, becoming smooth above. Juvenile leaves are sessile or shortly stalked, green to blue-green, opposite becoming alternate and linear to narrowly lanceolate to 9.5cm long and 1.1cm wide. Adult leaves are glossy green, alternate and narrowly lanceolate to linear to 13cm long and 1.5 cm wide. Flowerbuds are broadly ovoid to diamond-shaped and green to yellow to 0.8cm long and 0.4cm wide with conical operculum and they lack scars. Flowers are white and appear year round. Nuts are stalked and rarely sessile and cup-shaped to 0.7cm long and 0.5cm wide with descending discs and 3-4 valves near rim level or enclosed (Brooker and Kleinig 1994).

Restricted to inland regions of Queensland, New South Wales, Victoria and South Australia, green mallee is found in monotypic stands and mallee shrublands in shallow, light soils on rocky rises (Slee et al 2006). This species is not known to any protected estate.

### **Wandering Fringe-rush *Fimbristylis vagans***

*Rare* (Queensland)

Perennial, stoloniferous sedge to 60cm tall with distant, erect stems to 0.5mm thick and numerous, stiff, erect leaves shorter than the stems. Inflorescences are 1+ compound with 1-2 involucre bracts, solitary, brown and narrowly cylindrical spikelets to 2cm long and 0.2cm wide and ovate, membranous glumes to 2.5mm long (Blake 1940; Stanley and Ross 1989).

Wandering fringe-rush prefers wetlands in wet sandy soils in southern and central Queensland and is not represented in any conservation reserve (Stanley and Ross 1989).

## **Gonocarpus *Gonocarpus urceolatus***

*Vulnerable* (Queensland)

Herb to 30cm tall with branched, erect, hairy stems and sessile, opposite, widely spread, flat and ovate leaves to 22mm long and 13mm wide. Leaves are hairy and have thickened, toothed margins, becoming reduced up the stem. Flowers are green to deep red, hooded, keeled, clawed and sparsely scabrous (keel only) to 2.5mm long and 0.6mm wide with green, lanceolate sepals to 1mm long and 0.5mm wide. Flowers are held in simple, spike-like inflorescences in the leaf axils of alternate bracts (reduced leaves). Fruit are silvery-grey and pitcher-shaped to 2mm long and 1.1mm diameter and along with flowers, are produced mid spring (Orchard 1986).

*Gonocarpus* is known only from the type collections in the Chinchilla area, in south-eastern Queensland and at Peak Hill, near Emerald in central Queensland, where it is found in buloke (*Allocasuarina leuhmannii*) dominated vegetation. Suitable habitat includes brigalow (*Acacia harpophylla*)-belah (*Casuarina cristata*) open forest on fine-grained sedimentary rocks (RE11.9.5); poplar box (*Eucalyptus populnea*)-narrow-leaved box (*E. pilligaensis*) open forest to woodland on margins of clay plains (RE11.4.10); and Queensland blue gum (*E. tereticornis*) tall woodland on alluvial plains (RE11.3.4) and potential habitat may also include dusky-leaved ironbark (*E. fibrosa* ssp. *nubila*) woodland on lateritic duricrust (RE11.7.7); gum-topped ironbark (*E. decorticans*) woodland on lateritic duricrust (RE11.7.4); narrow-leaved red ironbark (*E. crebra*) woodland on sand plains and remnant surface (RE11.5.1); Shrublands on natural scalds on deeply weathered coarse-grained sedimentary rocks (RE11.7.5); and *Acacia* woodland on lateritic duricrust (RE11.7.2) (EPA 2002; Parsons Brinckerhoff 2007).

This species is not known to any conservation reserve and total population size is unknown. It is under threat by broad-scale vegetation clearing and habitat loss, changes to hydrological regimes, salinity, competition with weeds, road maintenance and genetic isolation from restricted distribution (ANRA 2008; Orchard 1986).

## **Belson's Panic Grass *Homopholis belsonii***

*Vulnerable* (Australia)

*Endangered* (Queensland)

Tufted grass to 40cm tall with sparsely branched lateral branches stems and silky membranous ligules to 1.5mm long. Leaves are flat and smooth to 15cm long and 4.5mm wide. Inflorescences are compound, open, stiff panicles to 25cm long and 0.35cm wide with solitary, 2-flowered, lanceolate and dorsally compressed spikelets to 6.1mm long (Sharp and Simon 2002).

Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales, this species is found in white box (*Eucalyptus albens*) communities and wilga (*Geijera parviflora*) woodlands on rocky hills; belah (*Casuarina cristata*) forests in alluvial soils on flat to undulating lands; poplar box (*E. populnea*) woodlands; and dry woodlands on poor soils derived from basalt at 200-520 m altitude. Belson's panic grass has also been recorded in brigalow (*Acacia harpophylla*), myall (*Acacia melvillei*) and weeping myall (*A. pendula*) communities; mountain coolibah (*E. organophila*) communities; and on roadsides and is under threat from the clearing of native habitat for cropping and pastures, heavy grazing and trampling by domestic stock, physical disturbance by machinery, urban expansion and weed invasion (DEWHA 2010; Sharp and Simon 2002).

## Central Queensland *Zamia Palm Macrozamia fearnsidei*

*Lower Risk (Least Concern)* (International)  
*Vulnerable* (Australia)

Small cycad with underground trunk to 35cm diameter and 5-20 frond-like, spirally twisted leaves to 1.5m tall. Leaflets are 55-120-numbered, dark green and shiny above and paler below. Pollen cones (flowers) are fusiform to 27cm long and 6.5cm diameter and have apical spines to 13mm long and seed cones (fruit) are ovoid to 18cm long and 10cm diameter with apical spine to 20mm long (DEC 2010; DEWHA 2010).

Restricted to the sandstone escarpments of the Great Dividing Range, north of Injune and Taroom, in central Queensland, this species occurs in open woodlands of large-fruited yellow jacket (*Corymbia watsoniana*), lemon-scented/spotted gum (*C. citriodora*) and budgeroo (*Lysicarpus angustifolius*). This species is well protected with most populations now conserved in national parks or held in state forest reserves. Potential threats to this species may include destruction in areas managed for grazing and removal for the horticultural trade and cycad enthusiasts (DEWHA 2010).

## Swamp Tea-tree *Melaleuca irbyana*

*Rare* (Queensland)  
*Endangered* (New South Wales)

Shrub or small tree to 8m tall with dense, rounded canopy of very fine, weeping foliage and thick, spongy and papery bark. Leaves are alternate, appressed and elliptic to ovate to 3mm long and 1.5mm wide. Flowers are white to cream and are held in groups of three in bottlebrush-like spikes to 2.5cm long. Flowers appear from spring to summer. Fruit are woody and globular to 4mm diameter.

Restricted to south-eastern Queensland and north-eastern New South Wales, this species is found in open eucalypt forests in poorly drained, usually clay, soils and is under threat from inappropriate fire regime, clearing of habitat for agriculture and development grazing by domestic stock, weed invasion, roadworks, timber harvesting activities and risk of local extinction due to small populations and lack of genetic diversity (Botanic Gardens Trust 2010; DEC 2010).

## Microcarpaea *Microcarpaea agonis*

*Endangered* (Australia)  
*Endangered* (Queensland)

Terrestrial herb to 5cm tall and 10cm wide with angular, glabrous stems and opposite, linear leaves to 9mm long and 0.5mm wide that connect across the nodes. Flowers are solitary with unribbed or weakly ribbed, sparsely hairy, ovoid, white calyx white tubes and are held in the leaf axils (DEWHA 2010)

Highly restricted species known only from the type locality on the margins of *Eleocharis-Cyperus* seasonal swamplands, in the Goondiwindi-Millmerran area in southern Queensland. This species is not represented in any protected reserve and with a total population size of 10 individuals, is under threat from grazing, roadworks and trampling by livestock (DEWHA 2010).



## **Gurulmundi Heath-myrtle *Micromyrtus carinata***

*Endangered* (Queensland)

Slender shrub to 2.5m tall and 0.5m wide with grey bark with shallow, longitudinal fissures and pendulous branches with grey, slightly convex and not winged or warty ribs. Leaves are overlapping, obovate to oblanceolate and glabrous to 1.5mm long and 0.7mm wide with prominent oil glands. Pale yellow flowers to 1.8mm diameter and indehiscent fruit appear in the leaf axils from late autumn to mid spring (Bean 1997).

Restricted to a small area north-west of Gurulmundi, in southern Queensland where it is found in heathlands and woodlands in association with narrow-leaved white mahogany (*Eucalyptus tenuipes*), brown bloodwood (*Corymbia trachyphloia*) and Gurulmundi fringe myrtle (*Calytrix gurulmundensis*), in shallow sandy soils on crests of mountain ranges. This species is not represented in protected estate (Bean 1997).

## **Waxflower *Philothea sporadica***

*Vulnerable* (Australia)

*Vulnerable* (Queensland)

Open to compact, many-branched, aromatic shrub to 1.5m tall with black, furrowed and almost minnirichi-like bark and green, fleshy, warty new shoots. Leaves are small, spoon-shaped, alternate, concolorous, warty and fleshy to 5mm long and 1mm wide with entire margins. Waxy, white, showy, five-petalled flowers appear in axillary clusters towards the ends of branches from late winter to mid spring and many lobed fruit with rounded to braked tips are produced in late spring (Wilson 1998).

Eleven populations (totalling 58,149 individuals) have been recorded north of Tara and approximately 12km east of Kogan in south-eastern Queensland, in low open acacia and eucalypt forest in shallow uniform sandy loams to clay loams on residual hills of laterised Cretaceous sandstones. This species is not known from any protected reserve and is under threat from inappropriate fire regimes, grazing by feral animals and native fauna species such as wallabies, erosion, habitat removal or destruction by agriculture and development and habitat degradation by weed infestation (DEWHA 2010; Wilson 1998).

## **Plains Picris *Picris barbarorum***

*Non-EVR Priority Taxon* (Brigalow Belt South Bioregion)

Erect, many-branched herb to 60cm tall with sparsely hairy, ribbed branches and entire to dentate, stalked, narrow obovate to oblanceolate basal leaves to 30cm long and 2.5cm wide. Stem leaves are reduced upwards, sessile and lanceolate to narrowly triangulate to 20cm long and 0.5cm wide. Yellow flowerheads to 8mm diameter with hairy bracts to 15mm long appear from mid winter to late spring and beaked, 5-ribbed, glabrous cypselas (fruit) to 7.5mm long are produced mid autumn (Botanic Gardens Trust 2010; Holzapfel 1994).

The Plains picris prefers floodplains of southern Queensland and New South Wales where it is found in association with black box (*Eucalyptus largiflorens*) and poplar box (*E. populnea*), low chenopod shrublands, tall mixed shrublands, low to medium high acacia and eucalypt woodlands with grassy understorey, *Astrebla* grasslands, she-oak woodlands and mixed rainforests. This species is not known to any protected reserve (Botanic Gardens Trust 2010; Holzapfel 1994).

## **Dunmore Mint-bush *Prostanthera* sp. Dunmore D.M.Gordon 8A**

*Vulnerable* (Australia)  
*Vulnerable* (Queensland)

The Dunmore mint-bush is a low, upright shrub to 1m tall with hairy stems and whorled, hairy, sessile, linear leaves to 1.2cm long and 2mm wide. Mauve to purple-blue, hairy flowers to 8mm long and produced in the leaf axils from early winter to mid spring (DEWHA 2010; DNR 1999).

This species is known from four populations across an area of than 100 sq km near Millmerran in south-eastern Queensland. It is found in *Eucalyptus-Callitris* woodlands in shallow sandy soils and eucalypt woodlands on hard sandstone ridge tops and has been recorded along the border of the Wondul National Park. Threats include disturbance of habitat by timber harvesting and inappropriate fire regime (DEWHA 2010; DNR 1999).

## **Cobar Greenhood Orchid *Pterostylis cobarensis***

*Vulnerable* (Australia)  
*Vulnerable* (New South Wales)

Terrestrial deciduous orchid to 40cm tall with narrow-elliptic leaves to 2.5cm long and 8mm wide forming basal rosette. Three to eight transparent flowers with brown and green markings to 1.2cm long appear on stems to 40cm tall in spring (Botanic Gardens Trust 2010; DEWHA 2010).

Restricted to the central eastern Australia from Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia, this species is found in eucalypt woodlands, open mallee and cypress pine shrubland in skeletal sandy loam soils on low stony ridges and slopes and in association with Morris' grey mallee (*Eucalyptus morrisii*), green mallee (*E. viridis*), gum coolibah (*E. intertexta*), Manara Hills red gum (*E. vicina*), white cypress pine (*Callitris glaucophylla*), wilga (*Geijera parviflora*), belah (*Casuarina cristata*), spearwood (*Acacia doratoxylon*) (DEC 2010; DEWHA 2010).

The Cobar greenhood reproduces vegetatively and is under threat from damage caused by feral goats, broad-scale vegetation clearing, grazing pressure, changed hydrology increasing salinity, fragmentation, loss of remnants and weed invasion (DEWHA 2010).

## **Red-soil Woolly Wrinklewort *Rutidosia lanata***

*Endangered* (Queensland)

Erect herb to 30cm tall with densely white woolly hairy stems and alternate, sessile, elliptic to lanceolate basal leaves to 4.5cm long and 9mm wide. Leaves green and moderately hairy above and white and densely woolly hairy below. Bell-shaped flowerheads to 16mm diameter produced from mid spring to early autumn. Fruit obovoid to 3mm long and 1.5mm wide (DNR 1999; Holland 1994).

This self-fertilising species is restricted to the Darling Downs district of southern Queensland, where it is found in poplar box (*Eucalyptus populnea*)-belah (*Casuarina cristata*) dominated forests, ironbark and currawong (*Acacia sparsiflora*) forests, box-ironwood forests and eucalypt forests in red-brown gravelly sands, grey clays, red-brown clay and sandy loams, on flat land and stony red ridges and at 280-320 m altitude. This species is under threat from destruction of habitat by clearing, inappropriate grazing regimes, road verge maintenance and habitat disturbance by weeds and introduced pasture grasses (DNR 1999; Holland 1994).

## References and Information Sources

- Australian Natural Resource Atlas. 2008. *Biodiversity Assessment – Brigalow Belt South: Species at Risk and the Threatening Processes*. <http://www.anra.gov.au/topics/vegetation/assessment/nsw/ibra-bbs-species-threats.html> accessed 10/12/2008.
- Bean, A.R. 2004. New species of *Cryptandra* Sm. and *Stenanthemum* Reissek (Rhamnaceae) from northern Australia. *Austrobaileya*. 6(4):917-940.
- Bean, A.R. 1997. A revision of *Micromyrtus* Benth. (Myrtaceae) in Queensland. *Austrobaileya*. 4(4): 458 – 469.
- Blake, S.T. 1940. Monographic studies in the Genus *Fimbristylis* (Cyperaceae) – Part 1. *University of Queensland Papers – Department of Biology*. 1(13): 1- 6.
- Botanic Gardens Trust. 2010. *PlantNET - The Plant Information Network System of Botanic Gardens Trust, Sydney, Australia (version 2)*. <http://plantnet.rbgsyd.nsw.gov.au> accessed 15/12/2010.
- Brooker, M. I. H. and Kleinig, D. A. 1994. *Field Guide to Eucalypts. Volume 3 - Northern Australia*. Blooming Books, Melbourne.
- Department of Natural Resources (DNR). 1999. *Species Management Profiles: Flora and Fauna Information System 2*. Department of Natural Resources, Brisbane.
- Department of the Environment, Water, Heritage and the Arts (DEWHA). 2010. *Species Profile and Threats Database*. Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/cgi-bin/sprat/> viewed 12/01/2010.
- Environmental Protection Agency (EPA). 2002. *Brigalow Belt South Flora Expert Panel Report*. Version 2.1. EPA, Brisbane.
- Holland, A.E. 1994. Two new species of *Rutidosis* DC. (Asteraceae: Gnaphalieae) from Queensland. *Austrobaileya*. 4(2): 199 – 203.
- Holzappel, S. 1994. A revision of the genus *Picris* (Asteraceae, Lactuceae) s.l. in Australia. *Willdenowia*. 24: 97 – 218.
- Maslin, B.R. (coordinator). 2001. *WATTLE: Acacias of Australia. CD-ROM, Version 1.0*. Australian Biological Resources Study, Canberra, and Department of Conservation and Land Management, Perth.
- NSW Scientific Committee. 2008. *Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions- endangered ecological community*. Final determination the Department of Environment and Conservation (NSW), Sydney.
- Orchard, A. E. 1986. New taxa in *Gonocarpus* and *Haloragis* (Haloragaceae). *Nuytsia*. 5(3): 332 – 334.
- Parsons Brinckerhoff. 2007. *Spring Gully to Braemar 330kV Transmission Line Project – Interim Environmental Impact Statement and Environmental Management Plan*.
- Santos. 2007. *Field Guide to Trees and Shrubs of Eastern Queensland Oil and Gas Fields*. Santos Ltd, Adelaide.

Sharp, D. & Simon, B.K. 2002. *AusGrass: Grasses of Australia*. CD-ROM, Version 1.0. Australian Biological Resources Study, Canberra, and Environmental Protection Agency, Queensland.

Slee, A.V., Brooker, M.I.H., Duffy, S.M. and West, J.G. 2006. *EUCLID: Eucalypts of Australia*. CD-ROM, Version 3.0. Centre for Plant Biodiversity Research, Australia.

Stanley, T.D. and Ross, E.M. 1989. *Flora of South-eastern Queensland*. Volume 3. Department of Primary Industries, Brisbane.

Wilson, P.G. 1998. A taxonomic review of the genera *Eriostemon* and *Philotheca* (Rutaceae: Boronieae). *Nuytsia*. 12(2): 239-265.

**Appendix L:**  
**Stand-alone Assessment of Existing Terrestrial Ecological**  
**Values of Proposed Telecommunications Infrastructure**  
**Locations**



**APPENDIX L**

**STAND-ALONE ASSESSMENT OF EXISTING TERRESTRIAL  
ECOLOGICAL VALUES OF PROPOSED  
TELECOMMUNICATIONS INFRASTRUCTURE LOCATIONS**

**TERRESTRIAL ECOLOGY AND IMPACT ASSESSMENT  
REPORT – GAS FIELDS COMPONENT  
AUSTRALIA PACIFIC LNG PROJECT EIS**

***Table of Contents***

<b>L.1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>L.2</b>	<b>MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE .....</b>	<b>3</b>
<b>L.3</b>	<b>ENVIRONMENTALLY SENSITIVE AREAS .....</b>	<b>3</b>
<b>L.4</b>	<b>BIODIVERSITY PLANNING ASSESSMENT.....</b>	<b>3</b>
<b>L.5</b>	<b>VEGETATION COMMUNITIES.....</b>	<b>4</b>
<b>L.6</b>	<b>HABITAT FOR CONSERVATION SIGNIFICANT FLORA AND FAUNA SPECIES.....</b>	<b>5</b>
<b>L.7</b>	<b>POTENTIAL IMPACTS .....</b>	<b>6</b>
<b>L.8</b>	<b>REFERENCES .....</b>	<b>9</b>

***List of Figures***

Figure L.1      Proposed Telecommunications Infrastructure Locations

***List of Attachments***

- Attachment 1:**    EPBC Act Online Protected Matters Search Tool Results
- Attachment 2:**    BPA Mapping (Tract Size and Corridors)
- Attachment 3:**    DERM-Certified Regional Ecosystem Mapping (Biodiversity Status and EPBC Status)

## L.1 INTRODUCTION

The proposed location of significant components of proposed telecommunications infrastructure associated with the Australia Pacific LNG Project outside of the main gas fields study area has necessitated a separate, stand-alone desktop assessment of terrestrial ecological values within these areas in addition to that presented for the main gas fields study area in **Section 2.0** of the main report. This includes an assessment of those proposed locations occurring within the main gas fields study area, which have not been specifically addressed as part of the impact assessment within **Section 3.0** of the main report.

Currently proposed infrastructure locations within and outside of the main gas fields study area are shown on **Figure L.1**, with coordinates provided in **Table L.1**. Nine of the 15 locations occur outside of the main gas fields study area.

**Table L.1: Proposed Telecommunications Infrastructure Locations**

Name	Latitude*	Longitude*
<b>Within Main Gas Fields Study Area</b>		
Braemar South	-27.279051	150.794621
Orana	-26.926487	150.557144
Dalwogan	-26.699290	150.141050
Conoli	-26.410890	149.882430
Ewingdale	-26.358330	149.636980
Muggleton	-26.401869	149.258094
<b>Outside of the Main Gas Fields Study Area</b>		
Captains Mountain	-27.917701	151.158152
Kumbarilla	-27.607431	151.091924
Ergon Telgazli	-27.315500	149.263611
Kincora	-27.046420	148.809278
Ergon Mt Bassett	-26.480833	148.878889
Grafton Range	-26.414767	148.911067
Carnarvon Range	-25.259238	148.416466
Ergon Expedition Range	-24.629032	149.029785
Roddas Lookout	-24.141914	148.153838

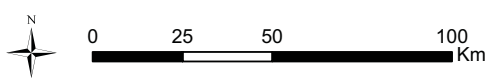
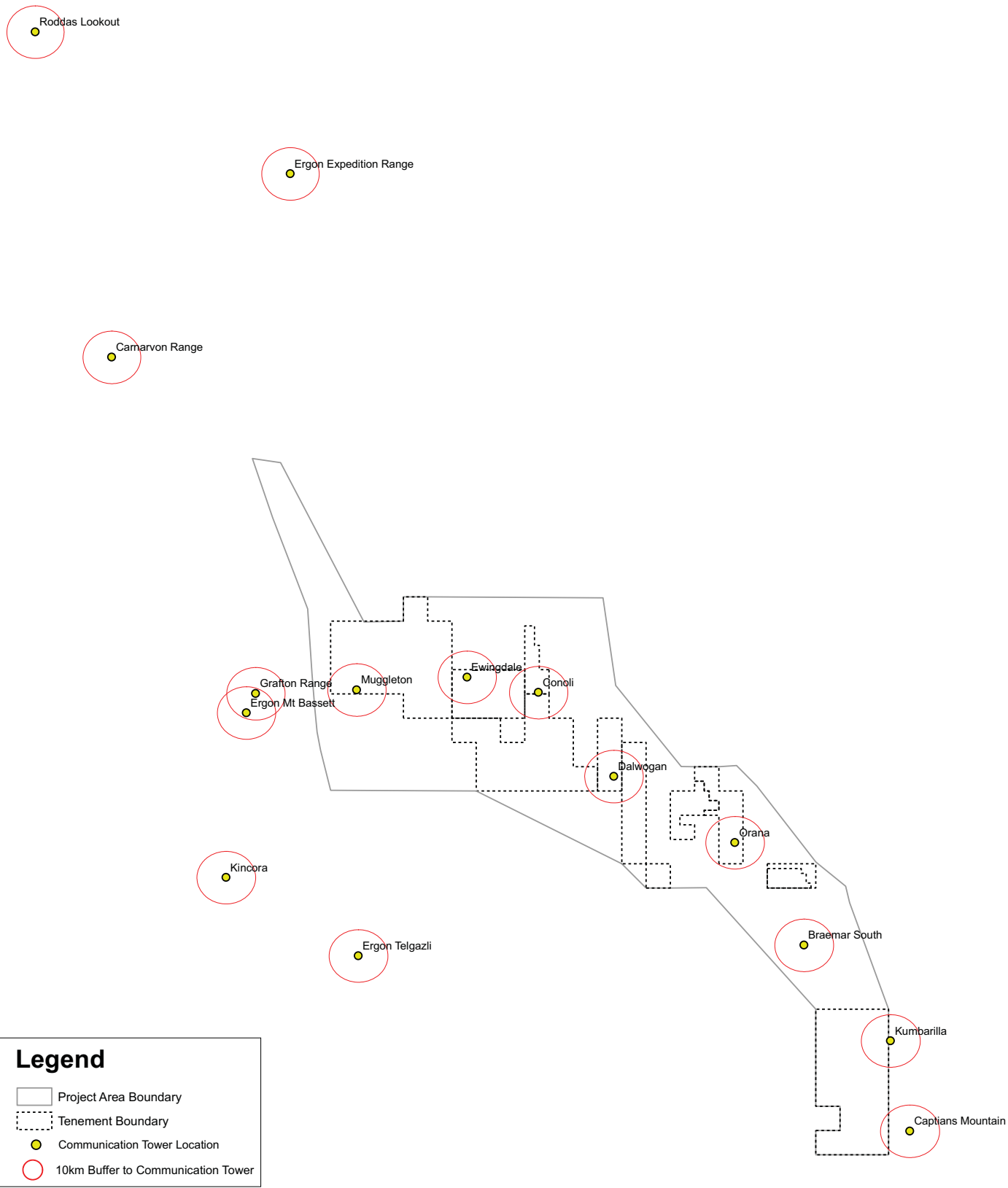
\*Centre point of site. Map datum GDA.

At each of the proposed locations, approximately 0.5ha will need to be permanently cleared of all existing vegetation and associated habitat for the placement and operation of telecommunications towers, while access tracks may also need to be established for the transportation of construction materials and machinery and to allow ongoing maintenance.

The assessment is presented in the following sections in terms of:

- Matters of National Environmental Significance (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- Environmentally Sensitive Areas, focusing on areas protected under the Queensland *Nature Conservation Act 1992* (NC Act), Queensland *Forestry Act 1959* and international treaties/agreements;
- Areas of high biodiversity significance identified by the Queensland Department of Environment and Resource Management's (DERM's) Regional Biodiversity Planning Assessment (BPA) for the Brigalow Belt South Bioregion; and
- Currently recognised remnant Regional Ecosystems (REs) listed under the Queensland *Vegetation Management Act 1999* (VM Act) and associated habitat for significant terrestrial flora and fauna species.

An overview of potential impacts from the proposed activities is also provided, based on the currently recognised values, along with recommendations for avoiding, mitigating or offsetting the identified impacts.



**Figure L.1**  
**Proposed Telecommunications Infrastructure Locations**  
 Terrestrial Ecology and Impact  
 Assessment Report (Gas Fields Component) -  
 Australia Pacific LNG Project EIS

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on or contains data provided by the Department of Environment and Resource Management, Queensland (accessed November 2009) which gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data.

© Biodiversity Assessment and Management Pty Ltd

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



## L.2 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The results of the EPBC Act Online Protected Matters Search Tool (DEWHA 2009) for an area that encompasses the outlying telecommunications infrastructure locations (**Attachment 1**) indicates that one additional threatened ecological community, 22 additional threatened species and three additional migratory species may occur in these locations, beyond those communities and species already considered for the main gas fields study area in **Appendix E**.

Due to restrictions imposed by the EPBC Act Online Protected Matters Search Tool, the area searched includes areas well outside of the locations of interest. Consequently, the actual or potential occurrence of the communities and species is discussed further in **Sections K5 and K6**, following consideration of vegetation mapping and associated habitat values for significant species.

## L.3 ENVIRONMENTALLY SENSITIVE AREAS

In terms of terrestrial ecology, environmentally sensitive areas include significant areas proclaimed under the NC Act (e.g. National Parks), Queensland *Forestry Act 1959* (Forestry Act) (e.g. State Forests) and international treaties/agreements (e.g. Ramsar wetlands), Ecological Communities listed under the EPBC Act, remnant vegetation listed under the VM Act and considered under the Queensland *Environmental Protection Act 1994* (EP Act), wetlands and riparian vegetation and important habitats for Endangered, Vulnerable, Rare or Near Threatened flora and fauna species (including corridors).

In terms of significant areas proclaimed under the NC Act or Forestry Act, a number of the proposed telecommunications infrastructure locations occur in close proximity to (or within) state forests or national parks, as summarised in **Table L.2**.

**Table L.2: Proposed Telecommunications Infrastructure Locations within 1 km of Significant Areas proclaimed under the NC Act or Forestry Act**

Location	Area	Proximity
Braemar South	Braemar State Forest	Approximately 1 km from boundary.
Conoli	Gurulmundi State Forest and Stones Country Resource Reserve.	On boundary.
Kumbarilla	Dunmore State Forest	On boundary.
Carnarvon Range	Carnarvon National Park	On boundary.
Ergon Expedition Range	Expedition State Forest.	Within boundary.

Other areas that would be regarded as sensitive with respect to terrestrial flora and fauna are addressed in more detail in the following sections.

## L.4 BIODIVERSITY PLANNING ASSESSMENT

The majority of the proposed telecommunications infrastructure locations occur within the Brigalow Belt South (BBS) bioregion and are therefore incorporated within the BBS BPA. The exceptions are the 'Roddas Lookout' and 'Ergon Expedition

Range' locations, which occur within the Brigalow Belt North (BBN) bioregion and incorporated within the BBN BPA.

As Queensland Herbarium RE mapping provides the basis for much of the BPA criteria and associated mapping, any project-scale assessment of REs (as provided in **Section L.5**) can replace the need to examine the broader-scale results of the BPA. The exceptions are those criteria that provide useful information about broad-scale habitat value and movement opportunities for native fauna that cannot

necessarily be obtained from other sources. Key criteria in this regard include:

- **Tract Size**, which indicates long-term habitat viability as “*larger tracts are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna*” (EPA 2002).
- **Corridors**, which provides particularly useful information on broad-scale fauna movement opportunities.

**Table L.3** provides a summary of the results for each of the currently proposed locations in terms of these criteria.

BPA mapping (Tract Size and Corridors) within a 10 km radius of each of the proposed locations is provided in **Attachment 2**.

**Table L.3: Summary of BPA Results for the Currently Proposed Telecommunications Infrastructure Locations in terms of Tract Size and Corridors**

Location	C Rating: Tract Size (High/Very High)	J Rating: Corridors (State/Regional)
Braemar South	Very High	State
Orana	Very High	-
Dalwogan	Very High	-
Conoli	Very High	State
Ewingdale	Very High	-
Muggleton	High	-
Captains Mountain	Very High	-
Kumbarilla	Very High	-
Ergon Telgazli	Very High	State
Kincora	-	-
Ergon Mt Bassett	-	-
Grafton Range	High	-
Carnarvon Range	High	State
Ergon Expedition Range	High/Very High	State
Roddas Lookout	Very High	State

## L.5 VEGETATION COMMUNITIES

A review of current 1:100,000 certified RE mapping v6 (DERM 2009) indicates that all but one of the proposed telecommunications infrastructure locations occur within REs with a Least Concern management status under the VM Act and a Biodiversity Status of No Concern at Present or, in the case of the proposed Dalwogan and Kincora locations, non-remnant vegetation (**Table L.4**).

The one exception is the Ergon Mt Bassett location, which is currently proposed within a patch of RE 11.9.5a that has an Endangered management status under the VM Act and an Endangered Biodiversity Status. RE 11.9.5a is also analogous to the Endangered ‘Brigalow (*Acacia harpophylla* dominant and co-dominant)’ ecological community under the EPBC Act.

In addition, while listed as Least Concern under state legislation, RE 11.8.2 (including the subset



11.8.2a) is listed under the relevant EPBC Act policy statement as a community that can potentially be described as the nationally Critically Endangered 'White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands' ecological community, if it contains the required floristic elements to meet the description on-ground. This RE is currently mapped as occurring at the Captains Mountain and Carnarvon Range locations.

RE mapping within a 10 km radius of each of the proposed locations is provided in **Attachment 3**, coloured according to Biodiversity Status and status under the EPBC Act. In all cases, ground-truthing will be required to confirm whether the current DERM-certified mapping is correct, and to establish whether vegetation communities at the proposed Ergon Mt Bassett, Captains Mountain and Carnarvon Range locations meet the requirements of the analogous threatened ecological communities under the EPBC Act.

## L.6 HABITAT FOR CONSERVATION SIGNIFICANT FLORA AND FAUNA SPECIES

In the majority of cases, remnant vegetation proposed to be disturbed by the establishment of the telecommunications infrastructure (based on DERM's RE mapping) has the potential to provide good quality habitat for a number of significant flora and/or fauna species. Non-remnant vegetation may also provide valuable resources for fauna depending on structural complexity and micro-habitat availability.

For those REs in **Table L.4** that occur within the main study area (11.5.1, 11.5.5, 11.7.2, 11.7.4, 11.7.5, 11.7.7, 11.9.5), associated habitat values for significant species known from the region are discussed in **Sections 2.3.2 and 2.4.2** of the main report. For the remaining REs, an overview of habitat values is provided below.

**Table L.4. Regional Ecosystems (REs) within which Telecommunications Infrastructure Locations are currently proposed based on current 1:100,000 mapping (DERM 2009)**

Location	RE <sup>1</sup>	Management Status <sup>2</sup>			EPBC Description
		EPBC Act	VM Act	EP Act	
Braemar South	11.7.4/ 11.7.7		LC	NC	
Orana	11.7.5		LC	NC	
Dalwogan	Non-remnant vegetation				
Conoli	11.7.7/ 11.7.4/ 11.5.1		LC	NC	
Ewingdale	11.5.1/ 11.7.2		LC	NC	
Muggleton	11.7.2/ 11.5.1		LC	NC	
Captains Mountain	11.8.2a	CE <sup>3</sup>	LC	NC	White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands <sup>3</sup>
Kumbarilla	11.7.4		LC	NC	
Ergon Telgazli	11.7.2/ 11.7.4/ 11.5.5		LC	NC	
Kincora	Non-remnant vegetation				
Ergon Mt Bassett	11.9.5a	E	E	E	Brigalow ( <i>Acacia harpophylla</i> dominant and co-dominant)
Grafton Range	11.8.5		LC	NC	
Carnarvon Range	11.8.2	CE <sup>3</sup>	LC	NC	White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grasslands <sup>3</sup>
Ergon Expedition Range	11.10.13a/ 11.10.13		LC	NC	
Roddas Lookout	11.8.4		LC	NC	

<sup>1</sup> Refer to DERM's Regional Ecosystem Description Database (REDD) v6 for full description ([http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional\\_ecosystems/](http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/)).

<sup>2</sup> Where: **E** = Endangered, **OC** = Of Concern, **LC** = Least Concern, **NC** = No Concern at Present. 'EP Act' status is based on the 'Biodiversity Status' prescribed on DERM's Regional Ecosystem Description Database v6.

<sup>3</sup> Potential only, subject to ground-truthing.

#### RE 11.8.2/11.8.2a

RE 11.8.2 (including 11.8.2a) provides potential high quality habitat for Austral Toadflax *Thesium australe* (Vulnerable under the EPBC Act and NC Act). This community also includes Forest Red Gum *Eucalyptus tereticornis* that, when mature, develops hollows that provide valuable roosting/breeding resources for a number of mammals species, including gliders and micro-bats, and birds such as parrots and owls and the tree is a food resource for Koala and Greater Glider *Petauroides volans*.

#### RE 11.8.4

RE 11.8.4 is grassy woodland found generally on the slopes of steep mountains and hills. Canopy species include Silver-leaved Ironbark *Eucalyptus melanophloia*, Narrow-leaved Red Ironbark *E. crebra* and Mountain Coolibah *E. orgadophila*. It is not considered to provide particularly good habitat for significant flora species and is likely to support more generalist woodland fauna, particularly arboreal mammals.

#### RE 11.8.5

This Least Concern RE is described as Mountain Coolibah *Eucalyptus orgadophila* grassy open woodland, which may also have bloodwoods and ironbarks in the canopy. There may be a softwood shrub layer and the ground layer is often dense. As for RE 11.8.4, this woodland habitat is not considered to provide particularly good habitat for significant flora species and is likely to support more generalist fauna species, including arboreal mammals.

Ground-truthing is required to establish the actual RE affected and the actual presence of any threatened flora species.

#### RE 11.10.13/11.10.13a

RE 11.10.13 (including 11.10.13a) *Eucalyptus* and *Corymbia* species open forest or woodland on sandstone scarps and is considered to provide good quality habitat for a number of significant flora species that could occur at the Ergon Expedition Range location, particularly:

- *Rutidosia crispata* (Rare under the NC Act);
- The Ironbark *Eucalyptus suffulgens* (listed as a non-EVR priority species for the Brigalow Belt South bioregion);
- Shiny-leaved Ironbark *Eucalyptus virens* (Vulnerable under the EPBC Act and NC Act); and
- *Macrozamia fearnsidei* (Vulnerable under the EPBC Act).

This community is also likely to provide resources for Koala, Greater Glider and Yellow-bellied Glider *Petaurus australis* and may support Large-eared Pied Bat *Chalinolobus dwyeri*, a little known cave-dwelling species with a strong association to sandstone. It would be important to survey for caves and crevices that may be used as roosts by this species.

### L.7 POTENTIAL IMPACTS

As started in **Section L.1**, approximately 0.5ha will need to be permanently cleared of all existing vegetation and associated habitat for the placement and operation of each telecommunications tower, while access tracks may also need to be established for the transportation of construction materials and machinery and to allow ongoing maintenance.

**Table L.5** provides an indicative assessment of potential impacts on currently recognised values as a result of this disturbance, along with recommended measures of avoidance, mitigation or offsetting (with reference to further details in **Section 3.5** of the main report, as required). In general, all proposed locations should be ground-truthed to confirm whether potential or currently recognised values are present, such that appropriate management measures are adopted. In particular, it is recommended that National Parks and any confirmed occurrences of threatened ecological communities under the EPBC Act and endangered REs are protected from all disturbances.

**Table L.5. Indicative assessment of impacts on currently recognised terrestrial ecological values**

Currently Recognised Value	Relevant Location(s)	Potential Impacts <sup>1</sup>	Recommendations
Carnarvon National Park	Carnarvon Range	Loss of up to 0.5ha of National Park vegetation/habitat and/or degradation of National Park vegetation/habitat due to tower placement and operation. Loss of National Park vegetation/habitat, increased fragmentation and/or degradation of vegetation/habitat due to access track creation and operation.	No disturbance within National Park and maintain 200m buffer between proposed activities and National Park boundary or implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) for works within 200m of boundary.
Stones Country Resource Reserve and Gurulmundi, Dunmore and Expedition State Forests	Conoli, Kumberilla and Ergon Expedition Range	Loss of up to 0.5ha of State Forest/Resource Reserve vegetation/habitat (per location) and/or degradation of State Forest/Resource Reserve vegetation/habitat due to tower placement and operation. Loss of State Forest/Resource Reserve vegetation/habitat, increased fragmentation and/or degradation of vegetation/habitat due to access track creation and operation.	Offset habitat loss ( <b>Appendix 0</b> ) where management measures cannot adequately mitigate impact. Avoid placement of access tracks that results in unnecessary fragmentation. Use existing tracks where possible.
Braemar State Forest	Braemar South	Loss of State Forest vegetation/habitat, increased fragmentation and/or degradation of State Forest vegetation/habitat due to access track creation and operation.	Offset habitat loss ( <b>Appendix 0</b> ) where management measures cannot adequately mitigate impact. Avoid placement of access tracks that results in unnecessary fragmentation. Use existing tracks where possible.
Area of High/Very High Tract Size identified under the BPA	All except Kincora and Ergon Mt Bassett	Increased fragmentation and/or degradation due to access track creation and operation.	Avoid placement of access tracks that results in unnecessary fragmentation. Use existing tracks where possible and implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).
State/Regional Corridors identified under the BPA	Braemar South, Conoli, Ergon Telgazli, Carnarvon Range, Ergon Expedition Range and Roddass Lookout	Increased fragmentation, vegetation/habitat degradation and/or reduction in movement opportunities for cryptic/non-volant fauna due to access track creation and operation.	Avoid placement of access tracks that results in unnecessary fragmentation and/or severs corridors. Use existing tracks where possible and implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).
Critically Endangered Ecological Communities under the EPBC Act	Captains Mountain (RE 11.8.2a) and Carnarvon Range (RE 11.8.2) <sup>2</sup>	Loss of up to 1ha of Critically Endangered ecological community and/or degradation due to tower placement and operation. Loss of Critically Endangered ecological community, increased fragmentation and/or degradation due to access track creation and operation.	No disturbance within any ground-truthed Critically Endangered ecological community and maintain 200m buffer between proposed activities and community boundary or implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) for works within 200m of boundary.
Endangered Ecological Communities under the EPBC Act	Ergon Mt Bassett (RE 11.9.5a) <sup>2</sup>	Loss of up to 0.5ha of Endangered ecological community and/or degradation due to tower placement and operation. Loss of Endangered ecological community, increased fragmentation and/or degradation due to access track creation and operation.	No disturbance within any ground-truthed Endangered ecological community and maintain 200m buffer between proposed activities and community boundary or implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) for works within 200m of boundary.
Endangered RE under	Ergon Mt Bassett	Loss of up to 0.5ha of Endangered RE and/or	No disturbance within any ground-truthed Endangered

Currently Recognised Value	Relevant Location(s)	Potential Impacts <sup>1</sup>	Recommendations
the VM Act and/or EP Act	(RE 11.9.5a)	degradation due to tower placement and operation. Loss of Endangered RE, increased fragmentation and/or degradation due to access track creation and operation.	RE and maintain 200m buffer between proposed activities and RE boundary or implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) for works within 200m of boundary.
Other Remnant Vegetation	Braemar South, Orana, Conoli, Ewingdale, Muggleton, Kumberilla, Ergon Telgazli, Grafton Range, Ergon Expedition Range and Roddas Lookout	Loss of up to 4.9ha of remnant vegetation and/or degradation due to tower placement and operation. Loss of remnant vegetation, increased fragmentation and/or degradation due to access track creation and operation.	Revegetate areas not required for operation immediately following construction. Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).
Significant Flora Species listed under the EPBC Act and/or NC Act and associated Habitat	All <sup>2</sup>	Loss and/or degradation of potential habitat due to tower placement/operation and/or access track creation/operation.	Undertake detailed seasonal field survey within 200m of proposed disturbance and implement threatened species management guidelines and other relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) within 200m of proposed activities if species present. If disturbance is unavoidable, apply to DEWHA and DERM for disturbance approval and design and implement a translocation plan according to Australian Network for Plant Conservation (2004). Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).
Non-EVR Priority Flora Species and associated Habitat	All <sup>2</sup>	Loss and/or degradation of potential habitat due to tower placement/operation and/or access track creation/operation.	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).
Significant Fauna Species listed under the EPBC Act and/or NC Act and associated Habitat	All <sup>2</sup>	Loss and/or degradation of potential habitat due to tower placement/operation. Loss and/or degradation of potential habitat and/or reduction in movement opportunities for cryptic/non-volant fauna due to access track creation and operation. Mortality during clearing activities.	Undertake detailed seasonal field survey within 200m of proposed disturbance and implement threatened species management guidelines and other relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report) within 200m of proposed activities if species present.
Non-EVR Priority Fauna Species and associated Habitat	All <sup>2</sup>	Loss and/or degradation of potential habitat due to tower placement/operation. Loss and/or degradation of potential habitat and/or reduction in movement opportunities for cryptic/non-volant fauna due to access track creation and operation Mortality during clearing activities.	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> of main report).

<sup>1</sup> Subject to ground-truthing. Degradation of vegetation/habitat can result from increased fire frequency, weed invasion, disease, excessive dust, altered surface and subsurface hydrology and nutrient dynamics introduced through neighbouring activities and through physical edge effects (e.g. increased light and temperature, decreased humidity).

<sup>2</sup> Potential only, subject to ground-truthing.

## L.8 REFERENCES

### **Australian Network for Plant Conservation**

(2004). *Guidelines for the Translocation of Plants 2<sup>nd</sup> Ed.* Prion, Canberra.

### **DERM (2009).** 'Regional Ecosystem Mapping.'

Version 6.0, Queensland Herbarium,  
Queensland Department of Environment and  
Resource Management, Brisbane.

### **DEWHA (2009).** 'EPBC Act Online Protected

Matters Search Tool.' Commonwealth  
Department of Environment, Water, Heritage  
and the Arts, Canberra. Accessed 5  
November 2009.

[http://www.environment.gov.au/erin/ert/epbc/  
index.html](http://www.environment.gov.au/erin/ert/epbc/index.html)

**EPA (2002).** 'Biodiversity Assessment and  
Mapping Methodology.' Environmental  
Protection Agency Biodiversity Planning  
Unit, Biodiversity Branch Version 2.1, July  
2002. Brisbane.



**ATTACHMENT 1**

**EPBC ACT ONLINE PROTECTED MATTERS SEARCH TOOL  
RESULTS**



## Protected Matters Search Tool

You are here: [Environment Home](#) > [EPBC Act](#) > [Search](#)

# EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the [caveat](#) at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at <http://www.environment.gov.au/atlas> may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

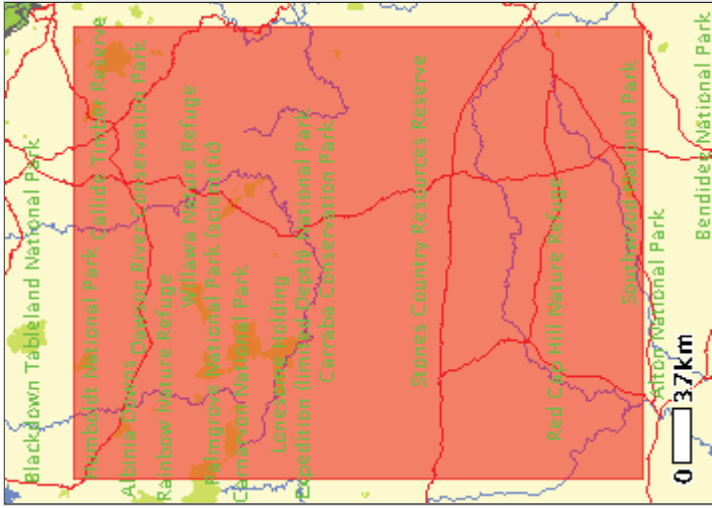
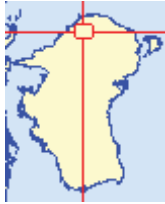
---

5 November 2009 18:05

**Search Type:** Area

**Buffer:** 1 km

**Coordinates:** -24.13333,148.15, -24.13333,151.1666, -27.93333,151.1666, -27.93333,148.15



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

- Report Contents:** [Summary](#)  
[Details](#)
- [Matters of NES](#)
  - [Other matters protected by the EPBC Act](#)
  - [Extra Information](#)
- [Caveat](#)  
[Acknowledgments](#)

## Summary

### Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

**World Heritage Properties:**

None

**National Heritage Places:**

None

**Wetlands of International Significance:**  
**(Ramsar Sites)**

**Commonwealth Marine Areas:**

**Threatened Ecological Communities:**

**Threatened Species:**

**Migratory Species:**

2	
None	
7	
77	
24	

**Other Matters Protected by the EPBC Act**

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

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

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov.au/epbc/permits/index.html>.

**Commonwealth Lands:**

**Commonwealth Heritage Places:**

**Places on the RNE:**

**Listed Marine Species:**

**Whales and Other Cetaceans:**

**Critical Habitats:**

**Commonwealth Reserves:**

1	
None	
32	
25	
None	
None	
None	

## Extra Information

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

[State and Territory Reserves:](#)

33

**Other Commonwealth Reserves:**

None

[Regional Forest Agreements:](#)

1

## Details

### Matters of National Environmental Significance

Wetlands of International Significance [ [Dataset Information](#) ]  
(Ramsar Sites)

[NARRAN LAKE NATURE RESERVE](#)

[SHOALWATER AND CORIO BAYS AREA](#)

Threatened Ecological Communities [ [Dataset Information](#) ]

[Brigalow \(\*Acacia harpophylla\* dominant and co-dominant\)](#)

[Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin](#)

[Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland](#)

[Semi-evergreen vine thickets of the Brigalow Belt \(North and South\) and Nandewar Bioregions](#)

[The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin](#)

[Weeping Myall Woodlands](#)

[White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland](#)

Within same catchment as Ramsar site

Within same catchment as Ramsar site

Type of Presence

Community known to occur within area

Community likely to occur within area

Community likely to occur within area

Critically Endangered

Community likely to occur within area

Community known to occur within area

Community likely to occur within area

Community likely to occur within area

Critically Endangered



Threatened Species [ [Dataset Information](#) ]

**Birds**

[Anthochaera phrygia](#)

Regent Honeyeater

[Erythroliorchis radiatus](#)

Red Goshawk

[Geophaps scripta scripta](#)

Squatter Pigeon (southern)

[Lathamus discolor](#)

Swift Parrot

[Neochmia ruficauda ruficauda](#)

Star Finch (eastern), Star Finch (southern)

[Polytelis swainsonii](#)

Superb Parrot

[Rostratula australis](#)

Australian Painted Snipe

[Turnix melanogaster](#)

Black-breasted Button-quail

**Frogs**

[Taudactylus pleione](#)

Kroombit Tinker Frog, Pleione's Torrent Frog

**Lungfishes**

[Neoceratodus forsteri](#)

Australian Lungfish, Queensland Lungfish

**Mammals**

[Chalinolobus dwyeri](#)

Large-eared Pied Bat, Large Pied Bat

[Dasyurus hallucatus](#)

Northern Quoll

[Dasyurus maculatus maculatus \(SE mainland population\)](#)

Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland)

Status	Type of Presence
Endangered	Species or species habitat may occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Endangered	Species or species habitat likely to occur within area
Endangered	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat may occur within area
Vulnerable	Species or species habitat may occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Vulnerable	Species or species habitat likely to occur within area
Endangered	Species or species habitat known to occur within area
Endangered	Species or species habitat may occur within area

population)

[Hipposideros semoni](#)

Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat

[Nyctophilus timoriensis \(South-eastern form\)](#)

Greater Long-eared Bat

[Pteropus poliocephalus](#)

Grey-headed Flying-fox

**Ray-finned fishes**

[Maccullochella peelii peelii](#)

Murray Cod, Cod, Goodoo

**Reptiles**

[Anomalopus mackayi](#)

Five-clawed Worm-skink, Long-legged Worm-skink

[Denisonia maculata](#)

Ornamental Snake

[Egernia rugosa](#)

Yakka Skink

[Furina dunmalli](#)

Dunmall's Snake

[Paradelma orientalis](#)

Brigalow Scaly-foot

[Rheodytes leukops](#)

Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle

[Tympanocryptis pinguicolla](#)

Grassland Earless Dragon

**Snails, slugs**

[Adclarkia dawsonensis](#)

Boggomoss Snail, Dawson Valley Snail

**Plants**

[Acacia chinchillensis](#)

Endangered

Species or species habitat may occur within area

Vulnerable

Species or species habitat may occur within area

Vulnerable

Species or species habitat may occur within area

Vulnerable

Species or species habitat may occur within area

Vulnerable

Species or species habitat may occur within area

Vulnerable

Species or species habitat likely to occur within area

Vulnerable

Species or species habitat likely to occur within area

Vulnerable

Species or species habitat may occur within area

Vulnerable

Species or species habitat likely to occur within area

Vulnerable

Species or species habitat may occur within area

Endangered

Species or species habitat may occur within area

Critically  
Endangered

Species or species habitat likely to occur within area

Vulnerable

Species or species habitat likely to occur within area

<a href="#">Acacia curranii</a> Curly-bark Wattle	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Acacia grandifolia</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Acacia handonis</a> Hando's Wattle, Percy Grant Wattle	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Acacia lauta</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Acacia wardellii</a>	Vulnerable	Species or species habitat may occur within area
<a href="#">Aristida annua</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Arthraxon hispidus</a> Hairy-joint Grass	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Bosistoa selwynii</a> Heart-leaved Bosistoa	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Bosistoa transversa</a> Three-leaved Bosistoa	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Bothriochloa biloba</a> Lobed Blue-grass	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Bulbophyllum globuliforme</a> Miniature Moss-orchid	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Cadellia pentastylis</a> Ooline	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Calytrix gurulumundensis</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Commersonia argentea</a> a shrub	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Cossinia australiana</a> Cossinia	Endangered	Species or species habitat likely to occur within area
<a href="#">Cupaniopsis shirleyana</a> Wedge-leaf Tuckeroo	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Cycas megacarpa</a>	Endangered	Species or species habitat known to occur within area
<a href="#">Denhamia parvifolia</a>	Vulnerable	Species or species habitat likely to occur within area

<a href="#"><u>Dichanthium queenslandicum</u></a> King Blue-grass	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Digitaria porrecta</u></a> Finger Panic Grass	Endangered	Species or species habitat likely to occur within area
<a href="#"><u>Diuris sheaffiana</u></a> Tricolour Diuris	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Eriocaulon carsonii</u></a> Salt Pipewort, Button Grass	Endangered	Species or species habitat likely to occur within area
<a href="#"><u>Eucalyptus argophloia</u></a> Queensland White Gum, Queensland Western White Gum, Lapunyah, Scrub Gum, White Gum	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Eucalyptus beaniana</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Eucalyptus virens</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Fontainea venosa</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Haloragis exalata subsp. velutina</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Homopholis belsonii</u></a>	Vulnerable	Species or species habitat may occur within area
<a href="#"><u>Homoranthus decumbens</u></a>	Vulnerable	Species or species habitat known to occur within area
<a href="#"><u>Macrozamia crassifolia</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Macrozamia fearnsidei</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Macrozamia pauli-guilielmi</u></a> Pineapple Zamia	Endangered	Species or species habitat likely to occur within area
<a href="#"><u>Macrozamia platyrhachis</u></a>	Endangered	Species or species habitat likely to occur within area
<a href="#"><u>Marsdenia brevifolia</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Microcarpaea agonis</u></a>	Endangered	Species or species habitat likely to occur within area
<a href="#"><u>Phebalium distans</u></a> Mt Berryman Phebalium	Critically Endangered	Species or species habitat may occur within area
<a href="#"><u>Philothea sporadica</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Polianthion minutiflorum</u></a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#"><u>Prostanthera sp. Dunmore (D.M.Gordon 84)</u></a>	Vulnerable	Species or species habitat likely to occur within area

<a href="#">Pterostylis cobarensis</a> Cobar Greenhood Orchid	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Quassia bidwillii</a> Quassia	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Rhaponticum australe</a> Austral Cornflower, Native Thistle	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Sarcochilus roseus</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Sophora fraseri</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Swainsona murrayana</a> Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Taeniophyllum muelleri</a> Minute Orchid, Ribbon-root Orchid	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Thesium australe</a> Austral Toadflax, Toadflax	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Tylophora linearis</a>	Endangered	Species or species habitat known to occur within area
<a href="#">Westringia parvifolia</a>	Vulnerable	Species or species habitat likely to occur within area
<a href="#">Xerothamnella herbacea</a>	Endangered	Species or species habitat likely to occur within area
<a href="#">Zieria verrucosa</a>	Vulnerable	Species or species habitat likely to occur within area

Migratory Species [ [Dataset Information](#) ]

**Migratory Terrestrial Species**

**Birds**

<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
<a href="#">Hirundapus caudacutus</a> White-throated Needletail	Migratory	Species or species habitat may occur within area
<a href="#">Hirundo rustica</a> Barn Swallow	Migratory	Species or species habitat may occur within area
<a href="#">Merops ornatus</a> Rainbow Bee-eater	Migratory	Species or species habitat may occur within area



[Monarcha melanopsis](#)

Black-faced Monarch

[Monarcha trivirgatus](#)

Spectacled Monarch

[Myiagra cyanoleuca](#)

Satin Flycatcher

[Rhipidura rufifrons](#)

Rufous Fantail

[Xanthomyza phrygia](#)

Regent Honeyeater

**Migratory Wetland Species**

**Birds**

[Ardea alba](#)

Great Egret, White Egret

[Ardea ibis](#)

Cattle Egret

[Calidris acuminata](#)

Sharp-tailed Sandpiper

[Calidris ferruginea](#)

Curlew Sandpiper

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe

[Limosa limosa](#)

Black-tailed Godwit

[Nettapus coromandelianus albipennis](#)

Australian Cotton Pygmy-geese

[Rostratula benghalensis s. lat.](#)

Painted Snipe

[Tringa glareola](#)

Wood Sandpiper

Migratory Species or species habitat may occur within area

Migratory Breeding likely to occur within area

Migratory Species or species habitat likely to occur within area

Migratory Breeding may occur within area

Migratory Species or species habitat may occur within area

Migratory Breeding likely to occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat known to occur within area

Migratory Species or species habitat known to occur within area

Migratory Species or species habitat known to occur within area

Migratory Species or species habitat known to occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat may occur within area

Migratory Species or species habitat known to occur within area

[\*Tringa nebularia\*](#)  
Common Greenshank, Greenshank  
[\*Tringa stagnatilis\*](#)  
Marsh Sandpiper, Little Greenshank

**Migratory Marine Birds**

[\*Apus pacificus\*](#)  
Fork-tailed Swift  
[\*Ardea alba\*](#)  
Great Egret, White Egret  
[\*Ardea ibis\*](#)  
Cattle Egret

**Migratory Marine Species**

**Reptiles**

[\*Crocodylus porosus\*](#)  
Estuarine Crocodile, Salt-water Crocodile

**Other Matters Protected by the EPBC Act**

Listed Marine Species [ [Dataset Information](#) ]

**Birds**

[\*Anseranas semipalmata\*](#)  
Magpie Goose

[\*Apus pacificus\*](#)  
Fork-tailed Swift

[\*Ardea alba\*](#)  
Great Egret, White Egret

[\*Ardea ibis\*](#)  
Cattle Egret

[\*Calidris acuminata\*](#)

Migratory	Species or species habitat known to occur within area
Migratory	Species or species habitat known to occur within area
Migratory	Species or species habitat may occur within area
Migratory	Breeding likely to occur within area
Migratory	Species or species habitat may occur within area
Migratory	Species or species habitat likely to occur within area

Status	Type of Presence
Listed - overfly marine area	Species or species habitat may occur within area
Listed - overfly marine area	Species or species habitat may occur within area
Listed - overfly marine area	Breeding likely to occur within area
Listed - overfly marine area	Species or species habitat may occur within area
Listed	Species or species habitat known to occur within area

Sharp-tailed Sandpiper

[Calidris ferruginea](#)  
Curlew Sandpiper

Listed -  
overfly marine  
area                      Species or species habitat known to occur within area

[Gallinago hardwickii](#)

Latham's Snipe, Japanese Snipe

Listed -  
overfly marine  
area                      Species or species habitat known to occur within area

[Haliaeetus leucogaster](#)  
White-bellied Sea-Eagle

Listed                      Species or species habitat likely to occur within area

[Himantopus himantopus](#)  
Black-winged Stilt

Listed -  
overfly marine  
area                      Species or species habitat known to occur within area

[Hirundapus caudacutus](#)  
White-throated Needletail

Listed -  
overfly marine  
area                      Species or species habitat may occur within area

[Hirundo rustica](#)  
Barn Swallow

Listed -  
overfly marine  
area                      Species or species habitat may occur within area

[Lathamus discolor](#)  
Swift Parrot

Listed -  
overfly marine  
area                      Species or species habitat likely to occur within area

[Limosa limosa](#)  
Black-tailed Godwit

Listed -  
overfly marine  
area                      Species or species habitat known to occur within area

[Merops ornatus](#)  
Rainbow Bee-eater

Listed -  
overfly marine  
area                      Species or species habitat may occur within area

[Monarcha melanopsis](#)  
Black-faced Monarch

Listed -  
overfly marine  
area                      Species or species habitat may occur within area

[Monarcha trivirgatus](#)  
Spectacled Monarch

Listed -  
overfly marine  
area                      Breeding likely to occur within area

[Myiagra cyanoleuca](#)  
Satin Flycatcher

Listed -  
overfly marine  
area

Species or species habitat likely to occur within area

[Nettapus coromandelianus albipennis](#)  
Australian Cotton Pygmy-goose

Listed -  
overfly marine  
area

Species or species habitat may occur within area

[Recurvirostra novaehollandiae](#)  
Red-necked Avocet

Listed -  
overfly marine  
area

Species or species habitat known to occur within area

[Rhipidura rufifrons](#)  
Rufous Fantail

Listed -  
overfly marine  
area

Breeding may occur within area

[Rostratula benghalensis s. lat.](#)  
Painted Snipe

Listed -  
overfly marine  
area

Species or species habitat may occur within area

[Tringa glareola](#)  
Wood Sandpiper

Listed -  
overfly marine  
area

Species or species habitat known to occur within area

[Tringa nebularia](#)  
Common Greenshank, Greenshank

Listed -  
overfly marine  
area

Species or species habitat known to occur within area

[Tringa stagnatilis](#)  
Marsh Sandpiper, Little Greenshank

Listed -  
overfly marine  
area

Species or species habitat known to occur within area

**Reptiles**

[Crocodylus porosus](#)  
Estuarine Crocodile, Salt-water Crocodile

Listed

Species or species habitat likely to occur within area

Commonwealth Lands [ [Dataset Information](#) ]

Defence

Places on the RNE [ [Dataset Information](#) ]

Note that not all Indigenous sites may be listed.

**Historic**

[Boonarga Cactoblastis Memorial Hall QLD](#)

[Eidsvold Homestead QLD](#)

[Greycliffe Homestead QLD](#)

[Kilburnie Homestead QLD](#)

[Myall Park Botanic Garden QLD](#)

[Roma War Memorial and Heroes Avenue QLD](#)

**Indigenous**

[Carnarvon Gorge Art Sites QLD](#)

[Carnarvon National Park Extension QLD](#)

[Fernbank Stone Arrangement QLD](#)

[Kogan Stone Arrangement QLD](#)

[Malleroo Stone Arrangement QLD](#)

[Wallaroo Areas QLD](#)

**Natural**

[Auburn River National Park QLD](#)

[Boggomosses Area No 1 QLD](#)

[Boggomosses Area No 2 QLD](#)

[Brigalow Invertebrate Site QLD](#)

[Cania Gorge National Park \(1978 Boundary\) QLD](#)

[Carnarvon National Park \(1978 boundary\) QLD](#)

[Carnarvon Range Area QLD](#)

[Chinchilla Sands Local Fossil Fauna Site QLD](#)

[Dawson River Environmental Parks QLD](#)

[Expedition Range Area QLD](#)

[Isla Gorge National Park \(1978 boundary\) QLD](#)

[Kongabula Area QLD](#)

[Kroombit Tops National Park \(1978 boundary\) QLD](#)

[Lonesome National Park QLD](#)



[Marengo National Park \(former\) QLD](#)

[Mount Scoria Environmental Park QLD](#)

[Palmgrove Fauna Reserve QLD](#)

[Robinson Gorge National Park \(former\) QLD](#)

[Roundstone Environmental Park QLD](#)

[Southwood National Park QLD](#)

## Extra Information

State and Territory Reserves [ [Dataset Information](#) ]

Auburn River National Park, QLD

Bell Creek Conservation Park, QLD

Cania Gorge National Park, QLD

Carnarvon National Park, QLD

Carraba Sandy Conservation Park, QLD

Coondarra Scientific Area, QLD

Dawson River Conservation Park, QLD

Erringibba Inlet National Park, QLD

Expedition National Park, QLD

Expedition Resource Reserve, QLD

Futter Creek Conservation Park, QLD

Highworth Bend Conservation Park, QLD

Hurdle Gully Scrub Scientific Area, QLD

Isla Gorge National Park, QLD

Kapunn Scientific Area, QLD

Kroombit Tops National Park, QLD

Lake Broadwater Conservation Park, QLD

Lake Broadwater Resource Reserve, QLD

Lake Murphy Conservation Park, QLD

Mount Scoria Conservation Park, QLD  
Nuga Nuga National Park, QLD  
Palmgrove National Park (Scientific), QLD  
Precipice National Park, QLD  
Rosehall Feature Protection Area, QLD  
Roundstone Conservation Park, QLD  
Singleton Scientific Area, QLD  
Southwood National Park, QLD  
Stones Country Resource Reserve, QLD  
Tolderodden Conservation Park, QLD  
Unnamed Scientific Area, QLD  
Waaje Wildflower Scientific Area, QLD  
Woolybark Scientific Area, QLD  
Zamia Creek Conservation Park, QLD  
Regional Forest Agreements [ [Dataset Information](#) ]  
Note that all RFA areas including those still under consideration have been included.  
South East Queensland RFA, Queensland

---

## Caveat

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

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

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

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

to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the [migratory](#) and [marine](#) provisions of the Act have been mapped.

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

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

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

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

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

## Acknowledgments

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

- [New South Wales National Parks and Wildlife Service](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Water and Environment, Tasmania](#)
- [Department of Environment and Heritage, South Australia Planning SA](#)
- [Parks and Wildlife Commission of the Northern Territory](#)
- [Environmental Protection Agency, Queensland](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)

- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- Other groups and individuals

[ANUCiM Version 1.8, Centre for Resource and Environmental Studies, Australian National University](#) was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

[Department of the Environment, Water, Heritage and the Arts](#)

GPO Box 787 Canberra ACT 2601 Australia

Telephone: +61 (0)2 6274 1111

© Commonwealth of Australia 2004

Last updated: Thursday, 20-Nov-2008 14:17:56 EST

**ATTACHMENT 2**  
**BPA MAPPING (TRACT SIZE AND CORRIDORS)**

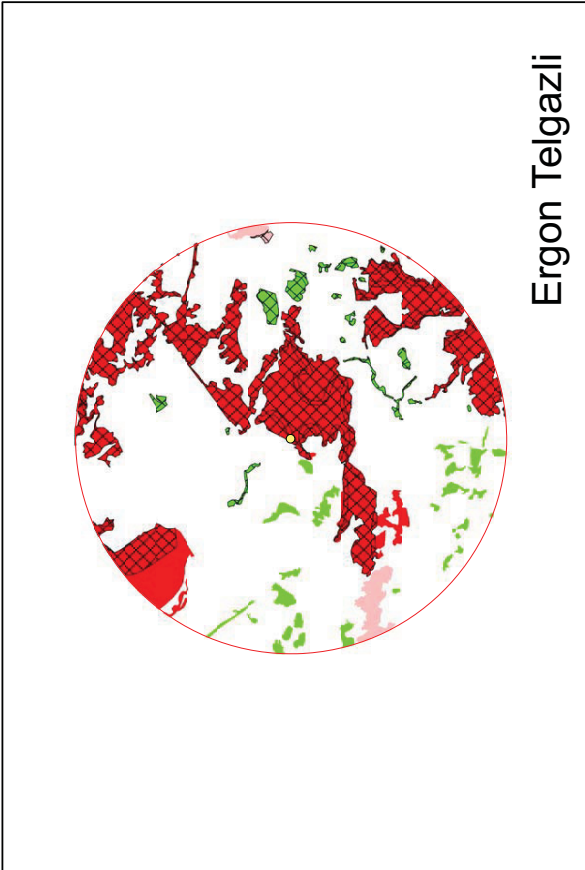




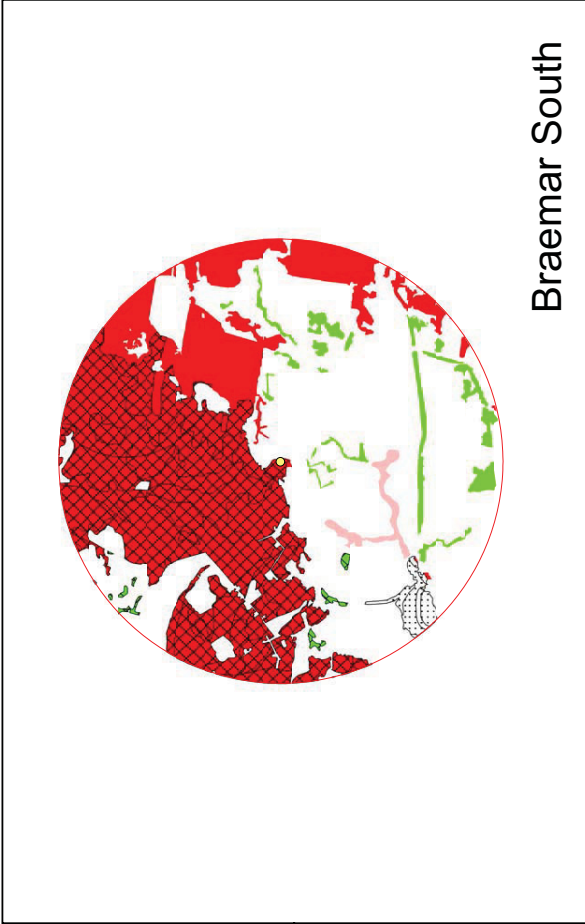
Captains Mountain



Kumbarilla



Ergon Telgazli



Braemar South

### Legend

- 10km Buffer to Communication Tower
- Location of Communication Tower

BPA C-Rating (Tract Size) BPA J-Rating (Corridor)

Very High	Regional
High	State
Other Values	

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on a corridor data provided by the Department of Environment and Resource Management. The data is provided for information only and does not constitute a guarantee of accuracy, reliability, completeness or suitability and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damages) resulting from its use of the data.

While every care is taken to ensure the accuracy of the data, Biodiversity Assessment and Management Pty Ltd disclaims all responsibility and all liability (including without limitation liability in negligence for all expenses, losses, damages or costs) for any loss, damage or costs (including consequential damages) which might be incurred as a result of the data being inaccurate or incomplete in any way and for any reason.



Figure L.2

BPA Mapping for Proposed Telecommunications Infrastructure Locations

Terrestrial Ecology and Impact Assessment Report  
(Gas Fields Component) - Australia Pacific LNG Project EIS







**ATTACHMENT 3**  
**DERM-CERTIFIED REGIONAL ECOSYSTEM MAPPING**





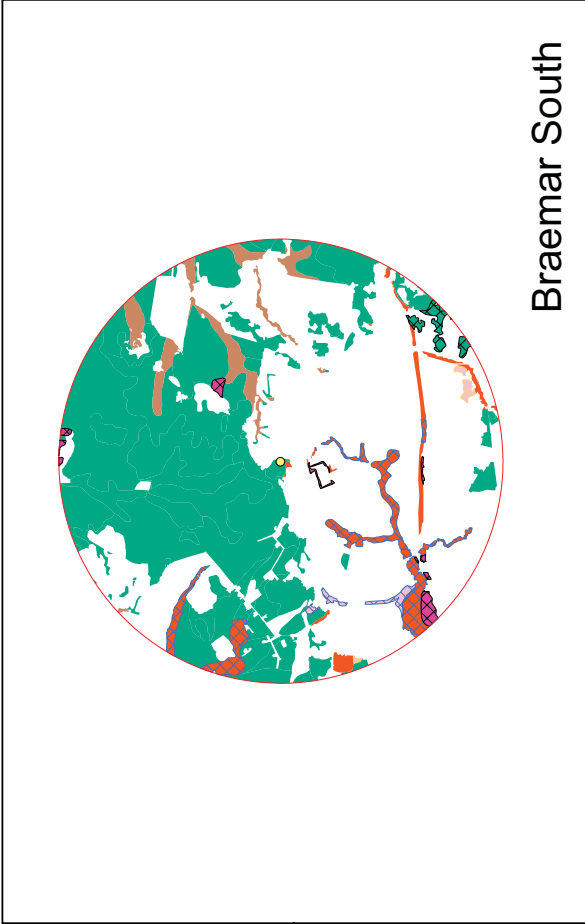
Captains Mountain



Kumbarilla



Ergon Telgazli



Braemar South



## Legend

10km Buffer to Communication Tower

Location of Communication Tower

Biodiversity Status

EPBC Act Status

Dominant Endangered RE

Sub-dominant Endangered RE

Dominant Of Concern RE

Sub-dominant Of Concern RE

No Concern at Present RE

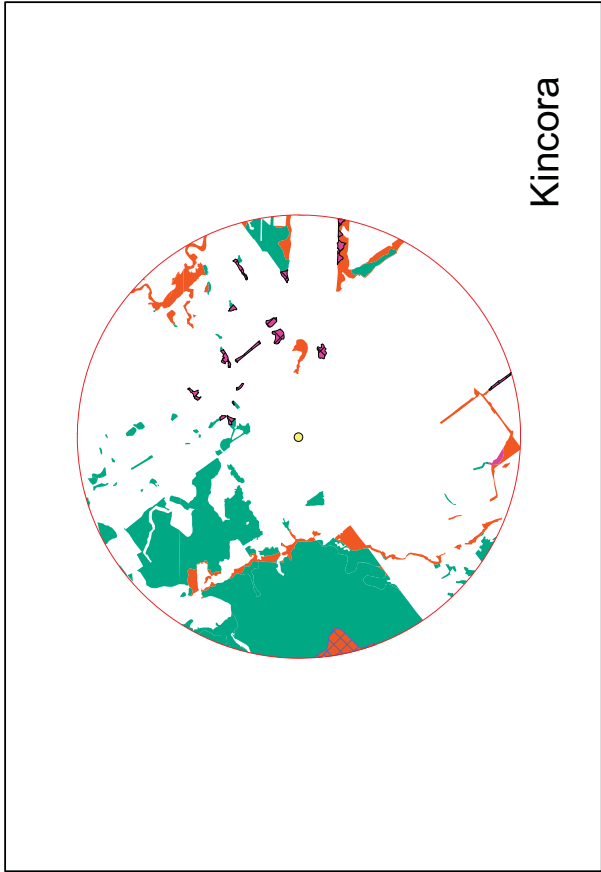
Endangered (Dominant subject to the occurrence of Weeping Myall / White box / Yellow box)

Endangered (Sub-dominant subject to the occurrence of Weeping Myall / White box / Yellow box)

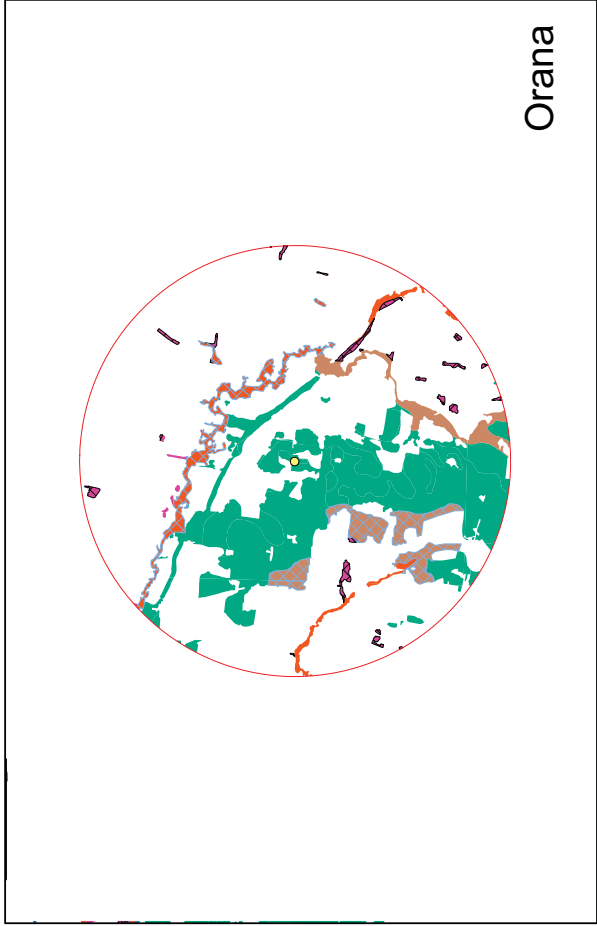


Figure L.6

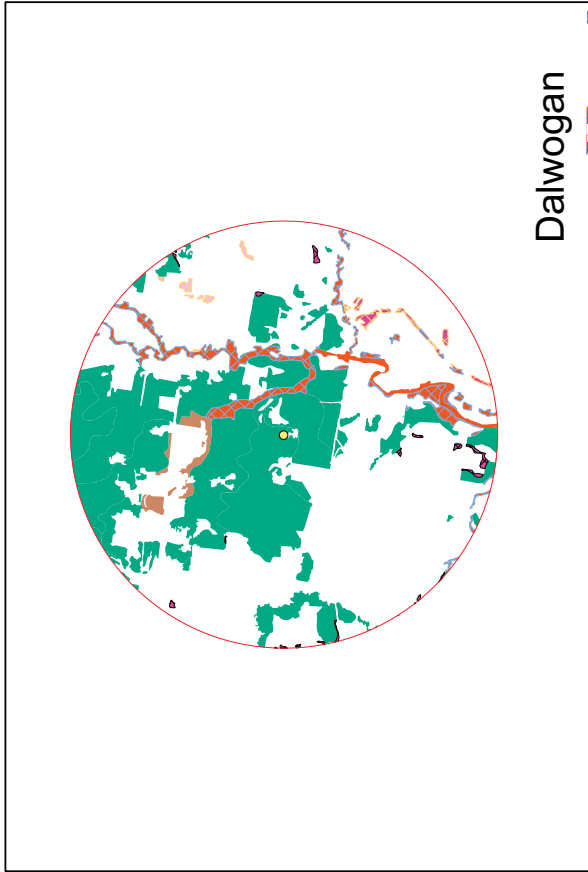
DERM Certified Regional Ecosystem Mapping (Biodiversity Status and EPBC Status) for Proposed Telecommunications Infrastructure Locations  
Terrestrial Ecology and Impact Assessment Report  
(Gas Fields Component) - Australia Pacific LNG Project EIS



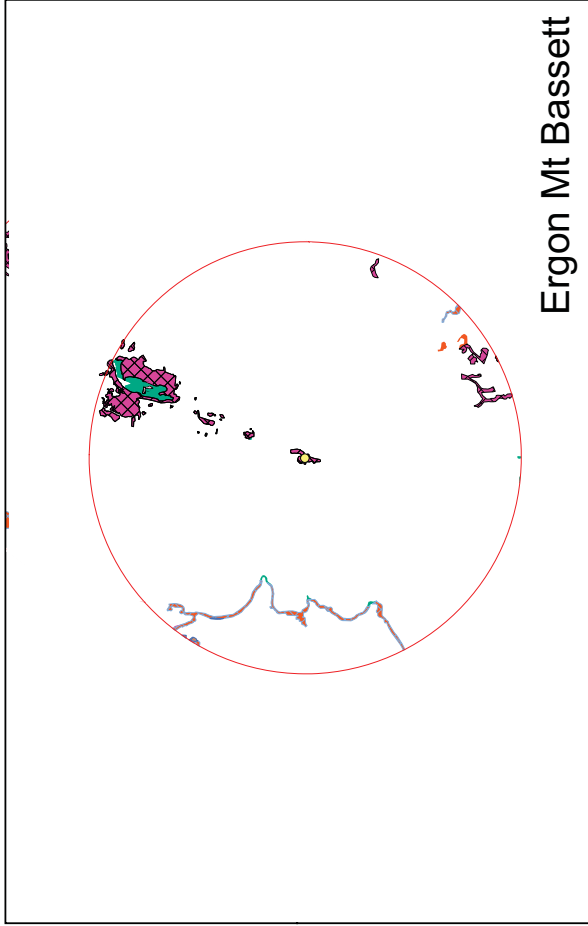
Kincora



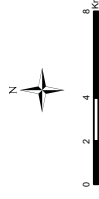
Orana



Dalwogan



Ergon Mt Bassett



## Legend

10km Buffer to Communication Tower

Location of Communication Tower

Biodiversity Status

EPBC Act Status

Dominant Endangered RE

Sub-dominant Endangered RE

Dominant Of Concern RE

Sub-dominant Of Concern RE

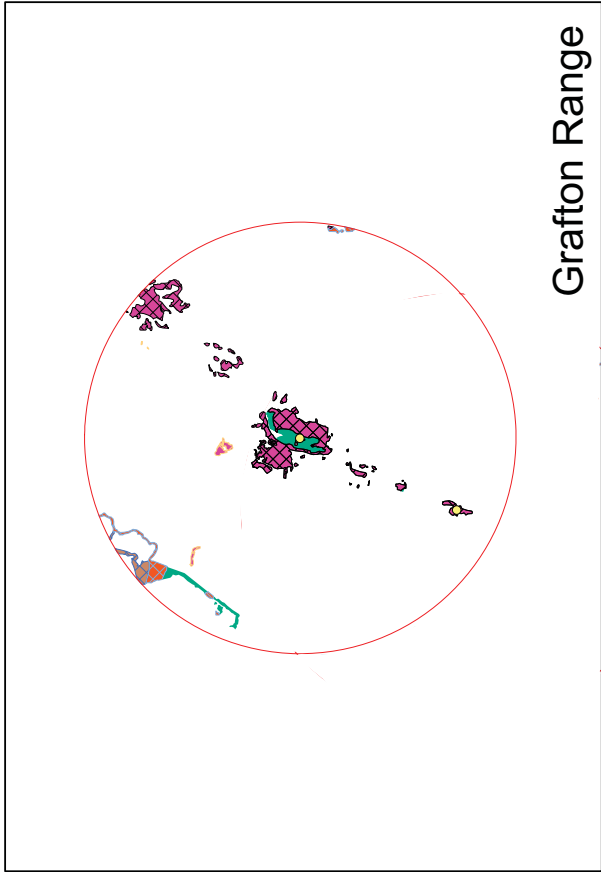
No Concern at Present RE

Endangered (Sub-dominant subject to the occurrence of Weeping Myall / White box / Yellow box)

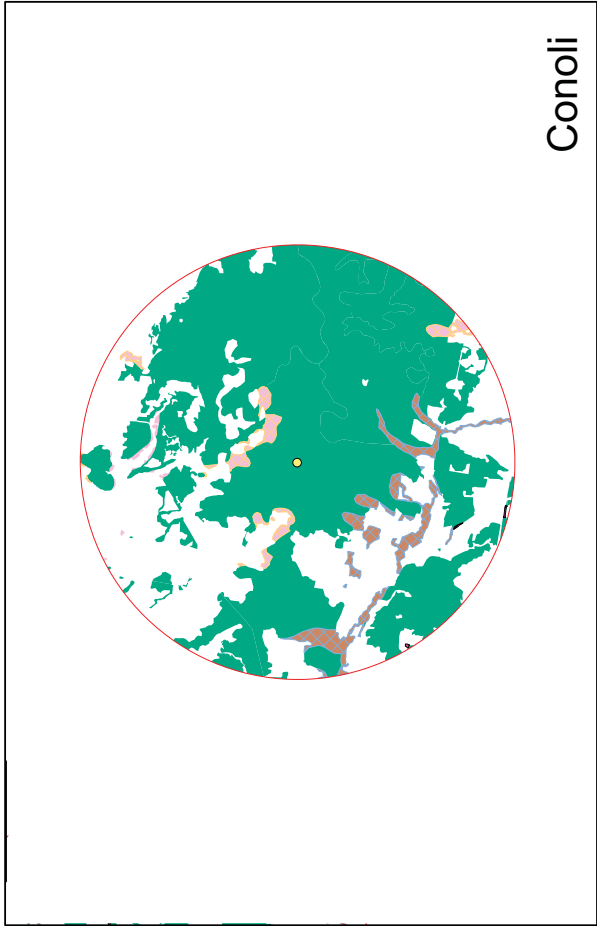


Figure L.7

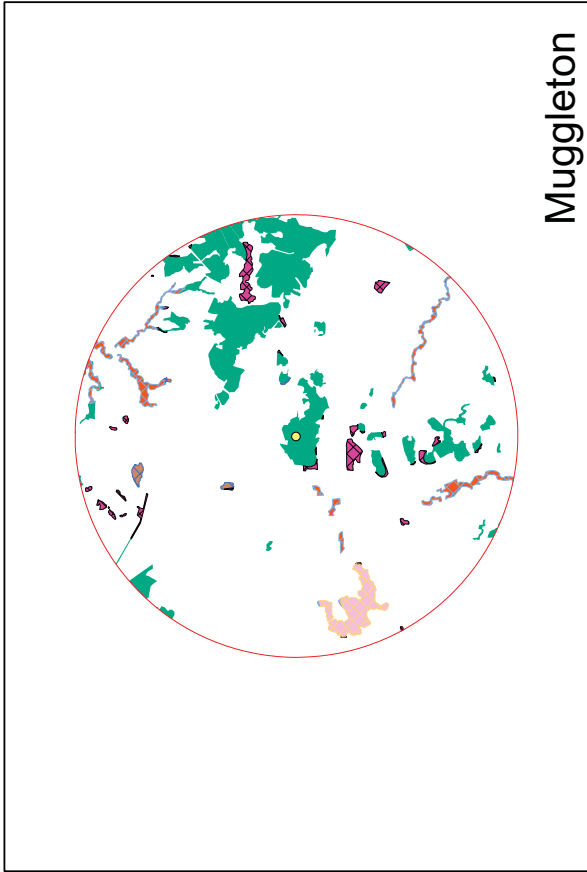
DERM Certified Regional Ecosystem Mapping (Biodiversity Status and EPBC Status) for Proposed Telecommunications Infrastructure Locations  
Terrestrial Ecology and Impact Assessment Report  
(Gas Fields Component) - Australia Pacific LNG Project EIS



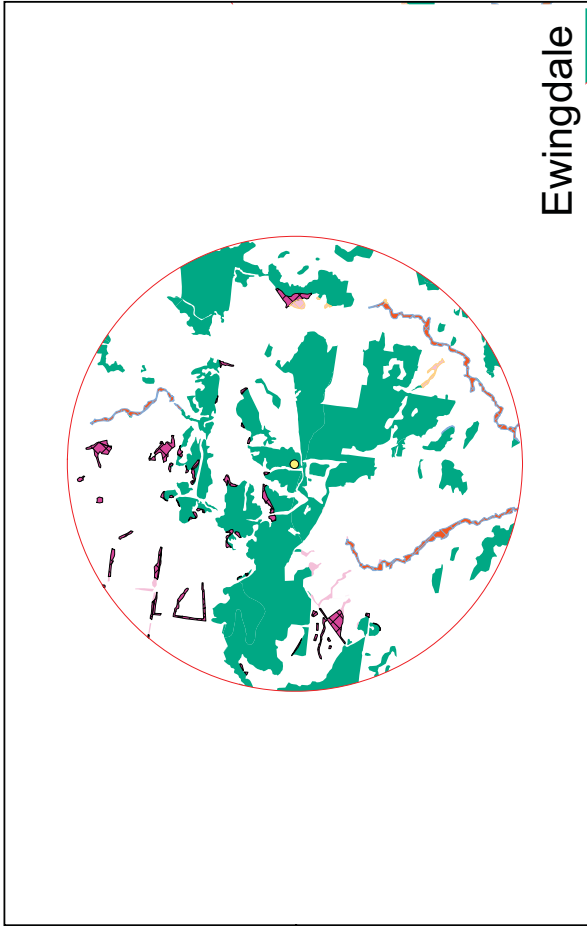
Grafton Range



Conoli



Muggleton



Ewingdale

## Legend

10km Buffer to Communication Tower

Location of Communication Tower

Biodiversity Status

EPBC Act Status

Dominant Endangered RE

Sub-dominant Endangered RE

Dominant Of Concern RE

Sub-dominant Of Concern RE

No Concern at Present RE



Endangered (Dominant subject to the occurrence of Weeping

Myall / White box / Yellow box)

Endangered (Sub-dominant subject to the occurrence of Weeping

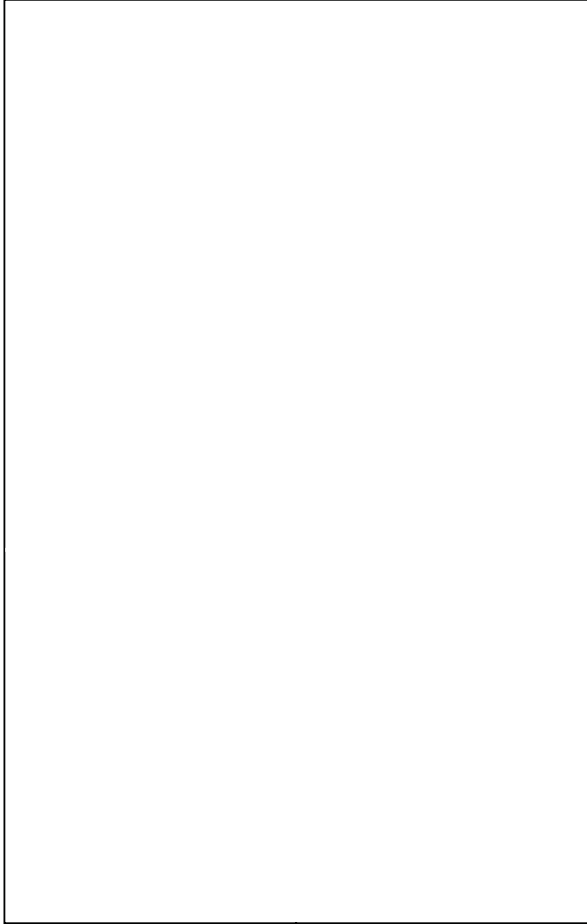
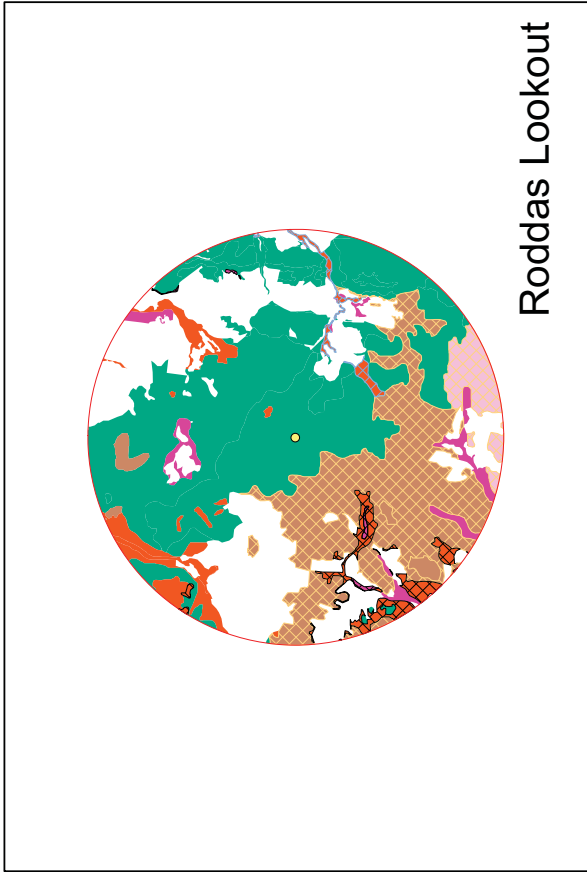
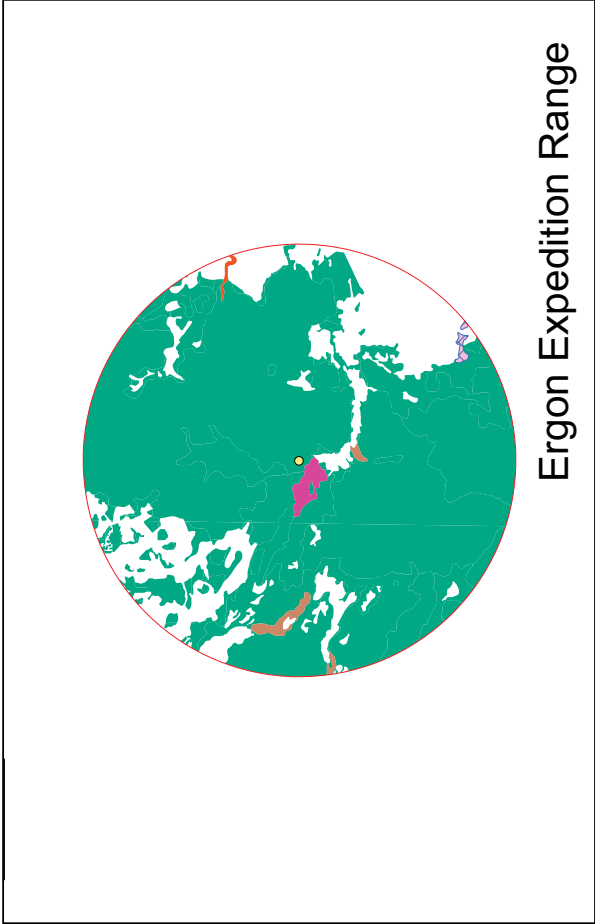
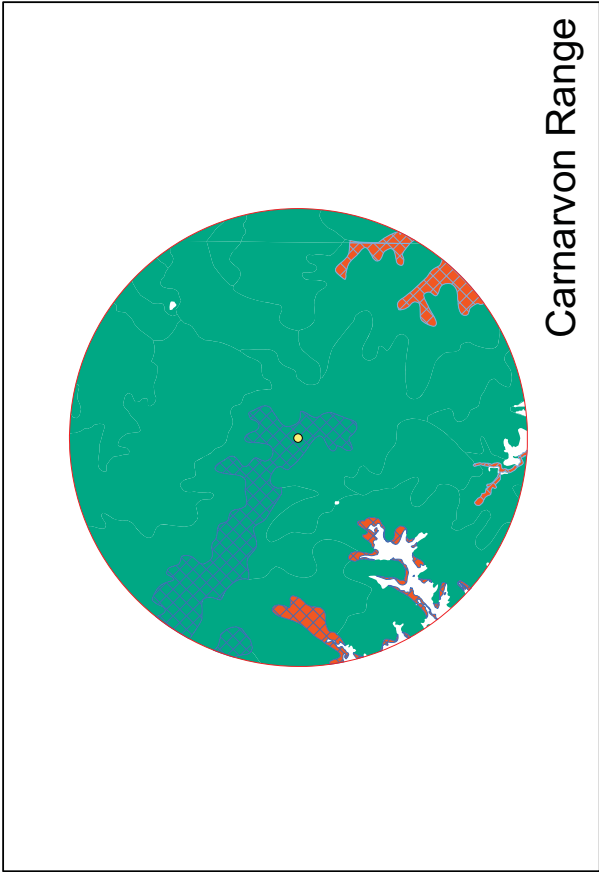
Myall / White box / Yellow box)

Figure L.8

DERM Certified Regional Ecosystem Mapping (Biodiversity Status and EPBC Status) for Proposed Telecommunications Infrastructure Locations  
Terrestrial Ecology and Impact Assessment Report  
(Gas Fields Component) - Australia Pacific LNG Project EIS

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on a constant data provided by the Department of Environment and Resource Management. The Department of Environment and Resource Management does not accept any liability for any errors, omissions, or inaccuracies in the data, or for any loss, damage or costs (including consequential damage) resulting from the use of the data. While every care is taken to ensure the accuracy of the data, Biodiversity Assessment and Management Pty Ltd does not accept any liability for any errors, omissions, or inaccuracies in the data, or for any loss, damage or costs (including consequential damage) resulting from the use of the data. Biodiversity Assessment and Management Pty Ltd does not accept any liability for any errors, omissions, or inaccuracies in the data, or for any loss, damage or costs (including consequential damage) resulting from the use of the data.



## Legend

- 10km Buffer to Communication Tower
- Location of Communication Tower

### Biodiversity Status

- Dominant Endangered RE
- Sub-dominant Endangered RE
- Dominant Of Concern RE
- Sub-dominant Of Concern RE
- No Concern at Present RE

### EPBC Act Status

- Endangered (Dominant RE within polygon)
- Endangered (Sub-dominant Endangered)
- Endangered (Dominant subject to the occurrence of Weeping Myall / White box / Yellow box)
- Endangered (Sub-dominant subject to the occurrence of Weeping Myall / White box / Yellow box)



Figure L.9

DERM Certified Regional Ecosystem Mapping (Biodiversity Status and EPBC Status) for Proposed Telecommunications Infrastructure Locations

Terrestrial Ecology and Impact Assessment Report  
(Gas Fields Component) - Australia Pacific LNG Project EIS

Copyright: The State of Queensland (Department of Environment and Resource Management) 2009

Based on a constant data provided by the Department of Environment and Resource Management (DERM) and the Department of Transport and Infrastructure (DTI) for the purpose of this assessment, the accuracy, reliability, completeness or suitability and acceptability of liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) resulting from the use of the data.

© Biodiversity Assessment and Management Pty Ltd

While every care is taken to ensure the accuracy of this data, Biodiversity Assessment and Management makes no representations or warranties, express or implied, about the accuracy, reliability, completeness or suitability and acceptability of liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) resulting from the use of the data. Biodiversity Assessment and Management Pty Ltd disclaims all responsibility and all liability (including without limitation liability in negligence for all expenses, losses, damages or costs (including consequential damage) resulting from the use of the data, being inaccurate or incomplete in any way for any reason.

## **Appendix M:**

### **Impact Assessment Methodology Matrices**



Impact Element	Element Features	UNMITIGATED IMPACTS									
		Likelihood of Impact Occurring									
		Certain	Probable	Possible	Unlikely	Very Unlikely	Highest Impact Level Predicted				
Area of national, state, regional or local conservation significance, species or communities that are endangered, vulnerable, rare, near threatened, of concern, of importance to state or regional biodiversity (fauna corridors, environmental weeds), or subject to international agreements (JAMBA, CAMBA, Ramsar).	Size of area/habitat affected	Minor	Minor	Negligible	Negligible	Negligible	Minor				
		Significant	Moderate	Moderate	Minor	Negligible	Significant				
		Major	Major	Significant	Moderate	Negligible	Major				
	Duration and intensity of impact	Significant	Moderate	Minor	Negligible	Negligible	Significant				
		Major	Significant	Moderate	Minor	Negligible	Major				
		Major	Major	Significant	Moderate	Negligible	Major				
	Ability of impact element to recover	Major	Major	Significant	Minor	Minor	Major				
		Significant	Significant	Moderate	Minor	Minor	Significant				
		Moderate	Moderate	Moderate	Minor	Minor	Moderate				
	Conservation status level	Moderate	Moderate	Minor	Minor	Negligible	Minor				
Significance of Study Area		Significant	Significant	Moderate	Moderate	Minor	Significant				
		Major	Major	Significant	Moderate	Moderate	Major				
		Significant	Significant	Moderate	Moderate	Minor	Significant				
		Moderate	Moderate	Moderate	Minor	Negligible	Moderate				

RESIDUAL IMPACTS																				
Impact Element	Mitigation Effectiveness	Likelihood of Impact Occurring & Predicted Unmitigated Impact Level																		
		Certain						Possible						Unlikely						Highest Impact Level Predicted
		Ma	S	Mo	Mi	Ma	S	Mo	Mi	Ma	S	Mo	Mi	Ma	S	Mo	Mi	Ma	S	
Area of national, state, regional or local conservation significance, species or communities that are endangered, vulnerable, rare, near threatened, of concern, of importance to state or regional biodiversity (fauna corridors, environmental weeds), or subject to international agreements (JAMBA, CAMBA, Ramsar).	Level to which mitigation measure alleviates impact																			
	Little effect	Ma	S	Mo	Mi	Ma	S	Mo	Mi	S		Mo	Mi		Mo	Mo	Mi	Mo		Major
	Moderately	S	S	Mo	Mi		Mo	Mo	Mi	Mo				Mo	Mi					Significant
	Significantly	Mo	Mo	Mi	N	Mo	Mi	Mi	N					Mi	Mi	N				Moderate
Completely		N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	Negligible

## PREDICTION RELIABILITY INDEX

Index	Description
High	Community/species composition, distribution and/or life history are well understood and/or habitats are readily defined and/or it is readily detected
Medium	Species life history is reasonably well understood and/or there is enough information to infer habitat preferences and/or it is reasonably easily detected
Low	Species life history is poorly known and/or its habitats are poorly known and/or it is very difficult to detect

**Appendix N:**  
**Terrestrial Ecology Impact Assessment Tables**

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
Nationally Significant Endangered Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains - RE 11.3.1 Also listed as Endangered under the VM Act	792 ha of this vegetation community occurs within the study area, representing 25% of this community within the relevant provinces. Study area is of moderate importance to this community.	<u>Direct:</u> Loss of approximately 4.51 ha (0.57% of study area extent and 0.15% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.3.1 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains - RE 11.3.2 (where it supports Weeping Myall) Also listed as Of Concern under the VM Act	14729ha of this vegetation community occurs within the study area, representing 9% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Loss of approximately 130ha (1% of study area extent and 0.9% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Prior to any works within RE 11.3.2 undertake search for Weeping Myall communities, avoid disturbance where communities are located. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of Weeping Myall communities through the Environmental Management Plan for the Project.	Possible	Medium term	Negligible (offset required for any clearing)	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrowleaved Box ( <i>E. piligaensis</i> ), Brigalow ( <i>Acacia harpophylla</i> ), Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains - RE 11.4.10 Also listed as Endangered under the VM Act	64ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Loss of approximately 0.9ha (1.4% of study area extent and 0.06% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Avoid disturbance to RE 11.4.10 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains - RE 11.4.3 Also listed as Endangered under the VM Act	4755ha of this vegetation community occurs within the study area, representing 15% of this community within the broader region. Study area is of moderate- low importance to this community.	<u>Direct:</u> Loss of approximately 19ha (0.4% of study area extent and 0.06% of provincial extent). Increased edge effects. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.4.3 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains RE 11.4.7 Also listed as Endangered under the VM Act	292ha of this vegetation community occurs within the study area, representing 9.5% of this community within the broader region. Study area is of moderate- low importance to this community.	<u>Direct:</u> Loss of approximately 0.43ha (0.15% of study area extent and 0.01% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Avoid disturbance to RE 11.4.7 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High

APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment					
Nationally Significant Endangered Ecological Communities (cont).	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides - RE 11.8.3	8 ha of this vegetation community occurs within the study area, representing 0.07% of this community within the broader region. Study area is of negligible importance to this community.	<u>Direct:</u> No disturbance proposed to this RE. <u>Indirect:</u> Edge effects from adjacent clearing.	Very unlikely	Short term	Minor	Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer through the Environmental Management Plan for the Project.	Very unlikely	Nil	Negligible	High
	Brigalow ( <i>Acacia harpophylla</i> ) - Dawson Gum ( <i>E. cambageana</i> ) open forest to woodland on fine-grained sedimentary rocks - RE 11.9.1 Also listed as Endangered under the VM Act	7 ha of this vegetation community occurs within the study area, representing 0.2% of this community within the broader region. Study area is of negligible importance to this community.	<u>Direct:</u> No disturbance proposed to this RE. <u>Indirect:</u> Edge effects from adjacent clearing.	Very unlikely	Short term	Minor	Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer through the Environmental Management Plan for the Project.	Very unlikely	Nil	Negligible	High
	Semi-evergreen vine thicket on fine grained sedimentary rocks - RE 11.9.4 Also listed as Of Concern under the VM Act	3605 ha of this vegetation community occurs within the study area, representing 33% of this community within the broader region. Study area is of negligible importance to this community.	<u>Direct:</u> Loss of approximately 13 ha (0.37% of study area extent and 0.1% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.9.4 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer pf all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine-grained sedimentary rocks - RE 11.9.5 Also listed as Endangered under the VM Act	10897 ha of this vegetation community occurs within the study area, representing 14% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Loss of approximately 45 ha (0.41% of study area extent and 0.06% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.9.5 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer pf all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Myall ( <i>Acacia melvillei</i> ) ± Brigalow ( <i>Acacia harpophylla</i> ) open forest on fine-grained sedimentary rocks - RE 11.9.6 Also listed as Endangered under the VM Act	118 ha of this vegetation community occurs within the study area, representing 32% of this community within the broader region. Study area is of high - moderate importance to this community.	<u>Direct:</u> No disturbance proposed to this RE. <u>Indirect:</u> Edge effects from adjacent clearing.	Very unlikely	Short term	Minor	Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer through the Environmental Management Plan for the Project.	Very unlikely	Nil	Negligible	High

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>State Significant Regional Ecosystems</b> Endangered REs (those that are not also EPBC listed)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains - RE 11.4.12	1183 ha of this vegetation community occurs within the study area, representing 27% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Loss of approximately 12.72 ha (1.08% of study area extent and 0.29% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.4.12 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Black Tea-tree ( <i>Melaleuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities - RE 11.4.3a	4759 ha of this vegetation community occurs within the study area, representing 14.7% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Loss of approximately 19 ha (0.4% of study area extent and 0.06% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.4.3a where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
<b>State Significant Regional Ecosystems</b> Of Concern REs (those that are not also EPBC listed)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on alluvial plains - RE 11.3.17 (also listed as Endangered Biodiversity Status under the VM Act)	86 ha of this vegetation community occurs within the study area, representing 2% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Loss of approximately 0.98 ha (1.14% of study area extent and 0.02% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Minor	Avoid disturbance to RE 11.3.17 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Negligible (offset required for any clearing)	High
	Coolibah ( <i>Eucalyptus coolabah</i> ) woodland on alluvial plains - RE 11.3.3	656ha of this vegetation community occurs within the study area, representing 5.7% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Loss of approximately 7.81 ha (1.19% of study area extent and 0.07% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Avoid disturbance to RE 11.3.3 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Regional Ecosystems Of Concern Res (those that are not also EPBC listed) (cont.)	Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains - RE 11.3.4	2596 ha of this vegetation community occurs within the study area, representing 19% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Loss of approximately 10.21 ha (0.39% of study area extent and 0.07% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Possible	Long term	Moderate	Avoid disturbance to RE 11.3.4 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) / False sandalwood ( <i>Erenophila mitchelli</i> ) shrubby woodland on fine-grained sedimentary rocks - RE 11.9.7	2375 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Loss of approximately 2.85 ha (0.12% of study area extent and 0.01% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Avoid disturbance to RE 11.9.7 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
	Brigalow ( <i>Acacia harpophylla</i> ) and Poplar Box ( <i>Eucalyptus populnea</i> ) open forest on fine-grained sedimentary rocks - RE 11.9.10	3140 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Loss of approximately 19.8 ha (0.63% of study area extent and 0.04% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Avoid disturbance to RE 11.9.10 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor (offset required for any clearing)	High
<b>Other Remnant Vegetation</b> Least Concern REs at limit of distribution	Black Box Open Forest - RE 11.3.16 (northerly extent)	73 ha of this vegetation community occurs within the study area, representing 100% of these communities within the broader region.	<u>Direct:</u> Loss of approximately 3 ha (3% of study area extent and 4% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Significant	Avoid disturbance to RE 11.3.16 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Possible	Medium term	Minor	High
	REs 11.3.14, 11.3.16, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.5.1, 11.5.4, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.9, 11.10.1, 11.10.9, 11.10.3, 11.10.7, 11.10.11 & 11.10.13	525612 ha of these vegetation communities occur within the study area, representing 21.7% of these communities within the broader region.	<u>Direct:</u> Loss of approximately 5745 ha (1.1% of study area extent and 0.24% of provincial extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Moderate	Revegetate areas not required for operation immediately following construction. Implement relevant components of the habitat management guidelines (Section 3.5), in particular clearing and weed management guidelines, through the Environmental Management Plan for the Project.	Probable	Long term	Minor	Medium



APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Non-Remnant Vegetation</b> Regrowth	Regrowth vegetation	37, 675 ha of these vegetation communities occur within the study area.	<u>Direct:</u> Loss of approximately 891 ha (2.4% of study area extent). Increased fragmentation of remaining patches. <u>Indirect:</u> Increased edge effects including weed invasion.	Probable	Long term	Minor	Revegetate areas not required for operation immediately following construction. Implement relevant components of the Habitat Management Guidelines (Section 3.5), in particular clearing and weed management guidelines, through the Environmental Management Plan for the Project.	Probable	Long term	Minor	Medium
<b>Nationally Significant Flora</b> EBPC Act Endangered	<i>Microcarpaea Microcarpaea agonis</i> (also listed as Endangered under VM Act)	Restricted to the Goondiwindi – Millmerran area in southern Queensland. Total one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 631 ha potential habitat (1.05% of study area and 0.16% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Short term	Negligible	High
	<i>Slender Tylophora Tylophora linearis</i> (also listed as Endangered under the NC Act)	Total of one database record for this species. Widely distributed outside of the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 126ha potential habitat (0.6% of study area extent and 0.2% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the habitat management guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Herbaceous Xerothamnella Xerothamnella herbacea</i> (also listed as Endangered under the NC Act)	Restricted to the Chinchilla – Goondiwindi region of southern Queensland. Total of nine database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Loss of approximately 151ha potential habitat (0.4% of study area extent and 0.05% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Flora</b> EPBC Act Vulnerable	Chinchilla Wattle <i>Acacia chinchillensis</i> (also listed as Near Threatened under the NC Act)	Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Total of 61 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Loss of approximately 3840 ha potential habitat ( 1% of study area extent and 0.3 % of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Probable	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the habitat management guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Curly-barked Wattle <i>Acacia curranii</i> (also listed as Vulnerable under the NC Act)	Restricted to Gulumundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. Total of 27 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Loss of approximately 37ha potential habitat within the Gulumundi region (2.5% of potential habitat within the Gulumundi region). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Probable	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Tara Wattle <i>Acacia lauta</i> (also listed as Vulnerable under the NC Act)	Restricted to the Inglewood - Tara region in the Darling Downs district of southern Queensland. Total of 8 database record for this species. The study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 1679ha potential habitat ( 0.9% of study area extent and 0.4% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Thomby Range Wattle <i>Acacia wardleii</i> (also listed as Vulnerable under the NC Act)	Restricted to south of Roma, south-west of Chinchilla and the Thomby Range, near Surat, south-eastern Queensland. Total of 13 database record for this species. The study area is of moderate - high importance to this species.	<u>Direct:</u> Loss of approximately 2113ha potential habitat ( 0.8% of study area extent and 0.2% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)											
Ooline <i>Cadellia penistylis</i> (also listed as Vulnerable under the NCA)	Known to occur within Wollabee tenement, between Jackson-Wandoan Road and Gurulmundi State Forest. Widely distributed outside of the study area. 15 database record. The study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 800ha potential habitat ( 0.9% of study area extent and 0.2% of provincial area extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.		Probable	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
				Probable	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
				Possible	Long term	Minor	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
Pink Donkey-orchid <i>Diuris tricolor</i>	Restricted to coastal ranges eastern Australia, from southeast Queensland to the New South Wales - Victoria border. Total of 7 database records, the study area is of low importance to this species	<u>Direct:</u> Loss of approximately 5890ha potential habitat (1.1% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.		Possible	Long term	Minor					
Shiny-leaved Ironbark <i>Eucalyptus wrens</i> (also listed as Vulnerable under the NC Act)	Restricted to four disjunct localities near Mt Moffatt in the Carnarvon area, Brovinia area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland. Total of three database records, the study area is of moderate importance to this species	<u>Direct:</u> Loss of approximately 1679ha potential habitat ( 0.9% of study area extent and 0.4% of provincial area extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.		Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Belson's Panic Grass <i>Homopholis belsonii</i> (also listed as Endangered under the NC Act)	Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales. Total seven database records the study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 198ha potential habitat ( 0.7% of study area extent and 0.07% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Central Queensland Zamia Palm <i>Macrozamia lemniscoides</i>	Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroom, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme northwestern end (Beilba/Kentucky area) (QLD Herbarium records). Total of one (1) database record the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 574ha potential habitat ( 1% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	a Waxflower <i>Philothea sporadica</i> (also listed as Vulnerable under the NC Act)	Restricted to north of Tara approximately 12 km east of Kogan in the Darling Downs District, in south-eastern Queensland. Total of 31 database records the study area is of high importance to this species.	<u>Direct:</u> Loss of approximately 37ha potential habitat within the Gurilmundi region (2.5% of potential habitat within the Gurilmundi region). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Dunmore Mint-bush <i>Prostanthera</i> sp. Dunmore (also listed as Vulnerable under the NC Act)	Restricted to near Millmerran in south-east Queensland. The study area is potentially of high importance to this species.	<u>Direct:</u> Loss of approximately 126ha potential habitat ( 1.7% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Probable	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA and/or DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Cobar Greenhood Orchid <i>Pterostylis cobarensis</i>	Restricted to Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. Total 6 database records the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 4944ha potential habitat ( 1.1% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
<b>State Significant Flora</b> NC Act Endangered	Gurulumundi Heath-myrtle <i>Micromyrtus carinata</i>	Restricted to a small area NW of Gurulumundi, in southern Queensland. Also known form 10km NW of Miles and an outlying population near westmar (Craig Eddie pers. Comm.) The study area is of high importance to this species.	<u>Direct:</u> Loss of approximately 1753ha potential habitat ( 0.8% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Red-soil Woolly Winklewort <i>Rutidosis lanata</i>	Restricted to the Darling Downs district of southern Queensland. Total of 10 database records. The study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 3821ha potential habitat ( 1.3% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
<b>State Significant Flora</b> NC Act Vulnerable	Gonocarpus <i>Gonocarpus urceolatus</i>	Restricted to the Chinchilla and Emerald districts of southeastern and central Queensland. Total 17 database records. The study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 1456ha potential habitat ( 0.9% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Vulnerable (cont.)	Bright Flat-sedge <i>Cyperus clarus</i>	Generally restricted to southeastern Queensland and northeastern New South Wales, but known from Palardo (west of Miles) within the Carninya tenement (Qld Herbarium record). Total one (1) database record the Project is of low importance to this species.	<u>Direct:</u> Loss of approximately 64ha potential habitat (0.4% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Winged Nighthshade <i>Solanum stenopterum</i>	Restricted to the Darling Downs and Burnett regions of southern Queensland and northwestern slopes region of New South Wales. Total of 3 database records. The study area is of moderate - low importance to this species.	<u>Direct:</u> Loss of approximately 2585ha potential habitat (1.4% of study area extent and 0.5% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DEWHA for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Western Rosewood <i>Acacia spania</i>	Restricted to the Emerald district of central Queensland. Total 3 database records, the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 13.3ha potential habitat (0.2% of study area extent and 0.0% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
State Significant Flora NC Act Rare	Scrub Wattle <i>Acacia tenuinervis</i>	Restricted to a few localities in south-eastern Queensland, from near Glenmorgan, north-west to Injune and east to just west of Monto. Total 40 database records. The study area is of moderate - high importance to this species.	<u>Direct:</u> Loss of approximately 3966ha potential habitat (1.1% of study area extent and 0.3% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Significant	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium



APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Rare (cont.)	Silky Cryptandra <i>Cryptandra ciliata</i>	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. Total of two (2) database records for this species. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 1424ha potential habitat (0.79% of study area and 0.17% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Moderate	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	High
	Blake's Spikerush <i>Eleocharis blakeana</i>	Restricted to southern Queensland and northern New South Wales. Total 14 database records. The study area is of moderate - low importance to this species.	<u>Direct:</u> Loss of approximately 709 ha potential habitat ( 0.9% of study area extent and 0.1 % of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Plunkett Mallee <i>Eucalyptus curtisii</i>	Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains. Records from the Gurulmundi area – possibly occurs in Stones County Reserve in Woleebee gas field. Total three (3) database records. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 37 ha potential habitat (2.5% of potential habitat within the Gurulmundi region). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	High
	Wandering Fringe-rush <i>Fimbristylis vagans</i>	Western Darling Downs. Total nine database records. The study area is of moderate - low importance to this species.	<u>Direct:</u> Loss of approximately 443ha potential habitat (0.9% of study area extent and 0.12% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Rare (cont.)	Swamp tea-tree <i>Melaleuca irbyana</i>	Generally restricted to southeastern Queensland and northeastern New South Wales, but known to occur in northwestern portion of study area (Craig Eddie pers. Comm.). Total of one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141 ha potential habitat (0.5% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Rainforest Cassia <i>Senna acclivis</i>	Restricted to coastal regions of central Queensland and central New South Wales. Known from Gurindji State Forest (Craig Eddie pers. Comm.). Total of one (1) database record for this species. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 13 ha potential habitat (0.37% of study area and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	High
	Myall <i>Acacia melvillei</i>	Occurs around Wandoo and Jondaryan. Frequent in Taroom Shire. The study area is of moderate importance to this species.	<u>Direct:</u> Loss of approximately 290ha potential habitat (0.7% of study area extent and 0.06% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
BAMM Priority Non-EVR Species	Bowyakka <i>Acacia microsperma</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species.	<u>Direct:</u> Loss of approximately 198 ha potential habitat (1% of study area extent and 0.2% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Acacia omalophylla</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 940 ha potential habitat (0.9% of study area extent and 0.2% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
BAMM Priority Non-EVR Species (cont.)	<i>Eucalyptus suffulgens</i>	Fairly widespread but scattered distribution in southeastern Queensland. Usually on hills and ranges from the Carnarvon Range and Blackdown tableland southwards to Isla Gorge, also on Callide Range near Biloela. endemic. Likely to occur within the extreme northwestern portion of the study area (Fairview/Beliba State Forest) (Craig Eddle pers.comm.). The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141 ha potential habitat (0.4% of study area extent and 0.03% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Eucalyptus viridis</i>	Very scattered and widespread in south-eastern Queensland. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 943ha potential habitat (0.8% of study area extent and 0.4% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Picris barbarorum</i>	Uncommon in NSW, Vic & Qld. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 64ha potential habitat (1% of study area extent) and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Environmental Management Plan for the Project if the species is located.	Very unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Bryophyllum delagoense</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Significant	Monitor native vegetation surrounding clearing. Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
Introduced Species of State Significance Declared Class 2 Pest under the LP Act	<i>Eriocereus martini</i>	Entire study area Particularly in vegetation communities on land zone 9	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Moderate to significant in Land zone 9	Monitor native vegetation surrounding clearing. Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Opuntia auranliaca</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Possible	Long term	Minor	Monitor native vegetation surrounding clearing. Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High

APPENDIX N

TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Introduced Species of State Significance Declared Class 2 Pest under the LP Act (cont.)	<i>Opuntia stricta</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Minor	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Opuntia tomentosa</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Minor	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Baccharis halimifolia</i>	Entire study area Particularly land zone 3	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Eichornia crassipes</i>	Entire study area Ponded surface waters	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Lyolum ferocissimum</i>	Entire study area, particularly runoff and run-on areas	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Possible	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Parthenium hysterophorus</i>	Entire study area - all soil types	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Senecio madagascariensis</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Possible	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Sporobolus jacquemontii</i>	Entire study area particularly areas receiving surface water runoff	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Possible	Long term	Significant	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High

APPENDIX N  
TABLE N.1 FLORA IMPACT - CLEARING

Element and Status Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Introduced Species	<i>Pennisetum ciliaris</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Possible	Long term	Moderate	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Eragrostis curvula</i>	Entire study area	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Moderate	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Megathyrus maximus</i>	Entire study area, particularly land zone 3	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Moderate	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High
	<i>Verbena aristigera</i>	Entire study area, particularly land zones 4, 8 and 9	Potential for weed spread by mechanical means through seeds or propagules during clearing and earthworks.	Probable	Long term	Moderate	Monitor native vegetation surrounding clearing . Implementation of relevant components of the weed management guidelines (Section 3.5.3) through the Environmental Management Plan for the Project.	Very unlikely	Short term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains RE 11.3.1 (Also listed as Endangered under the VM Act)	792 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of moderate importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains RE 11.3.2 (where supports Weeping Myall) (Also listed as Of Concern under the VM Act)	14729 ha of this vegetation community occurs within the study area, representing 9% of this community within the broader region. Study area is of moderate importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped occurrences of Weeping Myall or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer of Weeping Myall through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrow-leaved Box ( <i>E. pilligaensis</i> ), Brigalow ( <i>Acacia harpophylla</i> ), Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains RE 11.4.10 (Also listed as Endangered under the VM Act)	64 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate - low importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
		Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains RE 11.4.3 (Also listed as Endangered under the VM Act)	4755 ha of this vegetation community occurs within the study area, representing 15% of this community within the broader region. Study area is of moderate- low importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible



TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities (cont.)	Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains RE 11.4.7 (Also listed as Endangered under the VM Act)	292 ha of this vegetation community occurs within the study area, representing 9.5% of this community within the broader region. Study area is of moderate- low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides RE 11.8.3	8 ha of this vegetation community occurs within the study area, representing 0.07% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Brigalow ( <i>Acacia harpophylla</i> ) - Dawson Gum ( <i>E. caribageana</i> ) open forest to woodland on fine-grained sedimentary rocks RE 11.9.1 (Also listed as Endangered under the VM Act)	7 ha of this vegetation community occurs within the study area, representing 0.2% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Semi-evergreen vine thicket on fine grained sedimentary rocks RE 11.9.4 (Also listed as Of Concern under the VM Act)	3605 ha of this vegetation community occurs within the study area, representing 33% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact				Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Mitigation and Compensatory Measures	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant</b> Endangered Ecological Communities (cont.)	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine-grained sedimentary rocks RE 11.9.5 (Also listed as Endangered under the VM Act)	10897 ha of this vegetation community occurs within the study area, representing 14% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Myall ( <i>Acacia melvillei</i> ) ± Brigalow ( <i>Acacia harpophylla</i> ) open forest on fine-grained sedimentary rocks RE 11.9.6 (Also listed as Endangered under the VM Act)	118 ha of this vegetation community occurs within the study area, representing 32% of this community within the broader region. Study area is of high - moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Regional Ecosystems</b> Endangered RES	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains RE 11.4.12	1183 ha of this vegetation community occurs within the study area, representing 27% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Black Tea-tree ( <i>Maleuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities RE 11.4.3a	4 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Regional Ecosystems Of Concern REs	Poplar Box ( <i>Eucalyptus populifera</i> ) woodland with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on alluvial plains - RE 11.3.17 (also listed as Endangered Biodiversity Status under the VMA)	86 ha of this vegetation community occurs within the study area, representing 2% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Coolibah ( <i>Eucalyptus coolibah</i> ) woodland on alluvial plains RE 11.3.3	729 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Moderate	Maintain 100 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and/or Eucalyptus spp. tall woodland on alluvial plains RE 11.3.4	2596 ha of this vegetation community occurs within the study area, representing 19% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Moderate	Maintain 100 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
		Poplar Box ( <i>Eucalyptus populifera</i> ). False-sandalwood ( <i>Eremophila mitchellii</i> ) shrubby woodland on fine-grained sedimentary rocks - RE 11.9.7	2375 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Significant	Maintain 100 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Regional Ecosystems Of Concern REs (cont.)	Brigalow (Acacia harpophylla) and Poplar Box (Eucalyptus populnea) open forest on fine-grained sedimentary rocks - RE 11.9, 10	3140 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Significant	Maintain 100 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Other Remnant Vegetation</b> Least Concern REs at the limit of their distribution	Black Box Open Forest RE 11.3.16 (Northernly extent)	73 ha of these vegetation communities occur within the study area, representing 100% of these communities within the broader region.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Short Term	Significant	Maintain 100 m buffer between construction activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Other Remnant Vegetation</b> Least Concern REs	REs 11.3.14, 11.3.16, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.5.1, 11.5.4, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.9, 11.10.1, 11.10.9, 11.10.3, 11.10.7, 11.10.11 & 11.10.13	525612 ha of these vegetation communities occur within the study area, representing 21.7% of these communities within the broader region.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Long term	Moderate	Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines adjacent to construction areas, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Non-Remnant Vegetation</b> Regrowth	Analogous to a range of RE types.	37, 675 ha of these vegetation communities occur within the study area.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Probable	Long term	Minor	Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines adjacent to construction areas, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Cleared areas not required for construction purposes</b>	Composed of all RE types disturbed	Approximately one third of all initial clearing.	Rehabilitation and vegetation enhancement areas will be vulnerable to weed invasion and cattle damage.	n/a	n/a	n/a	Manage in accordance with Rehabilitation and Revegetation Guidelines ( <b>Section 3.5.5</b> ) through the Construction Environmental Management Plan for the Project.	n/a	n/a	n/a	n/a

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Flora</b> EBPC Act Endangered	<i>Microcarpaea</i> <i>Microcarpaea agonis</i> (also listed as Endangered under the NC Act)	Restricted to the Goondiwindi – Millmerran area in southern Queensland. Total one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Slender <i>Tylophora</i> <i>Tylophora linearis</i> (also listed as Endangered under the NC Act)	Total of one database record for this species. Widely distributed outside of the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Herbaceous <i>Xerothamnella</i> <i>Xerothamnella herpacea</i> (also listed as Endangered under the NC Act)	Restricted to the Chinchilla – Goondiwindi region of southern Queensland. Total of nine database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
<b>Nationally Significant Flora</b> EPBC Act Vulnerable	Chinchilla Wattle <i>Acacia chinchillensis</i> (also listed as Near Threatened under the NC Act)	Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Total of 61 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Curly-barked Wattle <i>Acacia curranii</i> (also listed as Vulnerable under the NC Act)	Restricted to Gurulmundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. Total of 27 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Tara Wattle <i>Acacia laeta</i> (also listed as Vulnerable under the NC Act)	Restricted to the Inglewood – Tara region in the Darling Downs district of southern Queensland. Total of 8 database record for this species. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Wardell's Wattle <i>Acacia wardellii</i> (also listed as Vulnerable under the NC Act)	Restricted to south of Roma, south-west of Chinchilla and the Thornby Range, near Surat, south-eastern Queensland. Total of 13 database record for this species. The study area is of moderate - high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Ooline <i>Cadellia pentastylis</i> (also listed as Vulnerable under the NCA)	Known to occur within Wolleabee tenement, between Jackson-Wandoan Road and Gurulmundi State Forest. Widely distributed outside of the study area, 15 database record. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High



APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Gurulumundi Fringe Myrtle <i>Calyrix gurulmundensis</i> (also listed as Vulnerable under the NC Act)	Restricted to the Gurulumundi, Guluguba and Barakula area in south-eastern Queensland. The study area is of high importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Pine Donkey-orchid <i>Diuris tricolor</i>	Restricted to coastal ranges eastern Australia, from south-east Queensland to the New South Wales - Victoria border. Total of 7 database records, the study area is of low importance to this species	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Shiny-leaved Ironbark <i>Eucalyptus virens</i> (also listed as Vulnerable under the NC Act)	Restricted to four disjunct localities near Mt Moffatt in the Camarvon area, Brovinia area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland. Total of three database records, the study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Belson's Panic Grass <i>Homopholis belsonii</i> (also listed as Endangered under the NC Act)	Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales. Total seven database records the study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	a Macrozamia <i>Macrozamia fearnsidei</i> (also listed as Vulnerable under the NC Act)	Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroom, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme north-western end (Beilba/Kentucky area) (QLD Herbarium records). Total of one (1) database record the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 574ha potential habitat ( 1% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium
	a Waxflower <i>Philothea sporadica</i> (also listed as Vulnerable under the NC Act)	Restricted to north of Tara approximately 12 km east of Kogan in the Darling Downs District, in south-eastern Queensland. Total of 31 database records the study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Dunmore Mint-bush <i>Prostanthera</i> sp. Dunmore (also listed as Vulnerable under the NC Act)	Restricted to near Millmerran in south-east Queensland. The study area is potentially of high importance to this species	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines (Section 3.5) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Cobar Greenhood Orchid <i>Pterostylis cobarensis</i>	Restricted to Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. Total 6 database records the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Endangered	Keeled Heath-myrtle <i>Micromyrtus carnata</i>	Restricted to a small area NW of Gurlumundi, in southern Queensland. Also known from 10km NW of Miles and an outlying population near westmar (Craig Eddie pers. Comm.). The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Red-soil Woolly Winklerwort <i>Rutidosia lanata</i>	Restricted to the Darling Downs district of southern Queensland. Total of 10 database records the study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Gonocarpus <i>Gonocarpus urceolatus</i>	Restricted to the Chinchilla and Emerald districts of south-eastern and central Queensland. Total 17 database records the Project is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Significant	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Bright Flat Sedge <i>Cyperus clarus</i>	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known from Palardo (west of Miles) within the Carinya tenement (Old Herbarium record). Total one (1) database record the Project is of low importance to this species.	<u>Direct:</u> Loss of approximately 64ha potential habitat ( 0.4% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long Term	Minor	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium
State Significant Flora NC Act Vulnerable	Winged Nighshade <i>Solanum stenopterum</i>	Restricted to the Darling Downs and Burnett regions of southern Queensland and northwestern slopes region of New South Wales. Total of 3 database records the Project is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 200m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Rare	Western Rosewood <i>Acacia spania</i>	Restricted to the Emerald district of central Queensland. Total 3 database records, the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Scrub Wattle <i>Acacia tenuinervis</i>	Restricted to a few localities in south-eastern Queensland, from near Glenmorgan, north-west to Injune and east to just west of Monto. Total 40 database records the study area is of moderate - high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Moderate	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Silky Cryptandra <i>Cryptandra ciliata</i>	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. Total of two (2) database records for this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Blake's Spikerush <i>Eleocharis blakeana</i>	Restricted to southern Queensland and northern New South Wales. Total 14 database records the study area is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Rare (cont.)	Plunkett Mallee <i>Eucalyptus curtisii</i>	Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains. Records from the Goolimundi area – possibly occurs in Stones County Resource Reserve in Woleebee gas field. Total three (3) database records. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Wandering Fringe-rush <i>Fimbristylis vagans</i>	Western Darling Downs. Total nine database records the study area is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Manage known habitat within 100m of construction activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Swamp tea-tree <i>Melaleuca ibyana</i>	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known to occur in north-western portion of study area (Craig Eddie pers. comm.). Total of one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141ha potential habitat ( 0.5% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Rainforest Cassia <i>Senna acclins</i>	Restricted to coastal regions of central Queensland and central New South Wales. Known from Goolimundi State Forest. Known form Goolimundi State Forest (Craig eddie pers. Comm.). Total of one (1) database record for this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
BAMM Priority Non-EVR Species	<i>Acacia melvillei</i>	Occurs around Wandaan and Jondaryan. Frequent in Taroom Shire. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Bowakka <i>Acacia microserpa</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Acacia ornatophylla</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Eucalyptus suffulgens</i>	Fairly widespread but scattered distribution in south-eastern Queensland. Usually on hills and ranges from the Carnarvon Range and Blackdown tableland south-eastwards to Isla Gorge, also on Callide Range near Biloela; endemic. Likely to occur within the extreme north-western portion of the study area (Fairview/Beilba State Forest) (Craig Eddle pers. comm.). The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141 ha potential habitat (0.4% of study area extent and 0.03% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Nil	No disturbance - negligible Disturbance (offset by translocation) - Minor	Medium



APPENDIX N  
TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
BAMM Priority Non-EVR Species (cont.)	<i>Eucalyptus rhombica</i>	Restricted distribution in Queensland from north-east of Eidsvold to near Karara. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines (Section 3.5) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Eucalyptus viridis</i>	Very scattered and widespread in south-eastern Queensland. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring construction activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines (Section 3.5) adjacent to construction activities through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
Declared Class 2 Pest under the LP Act	<i>Picris barbarorum</i>	Uncommon in NSW, Vic & Qld. The study area is of low importance to this species.	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials. Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Long Term	Minor	Implement Weed Management Recommendations (Section 3.5.3).	Very Unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	<i>Opuntia auranziaca</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials. Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Minor	Implement Weed Management Recommendations (Section 3.5.3) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Opuntia stricta</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials. Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Minor	Implement Weed Management Recommendations (Section 3.5.3) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Declared Class 2 Pest under the LP Act (cont.)	<i>Opuntia tomentosa</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Minor	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Senecio madagascariensis</i>	Entire study area Particularly land zone 3	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Baccharis halimifolia</i>	Entire study area Ponded surface waters	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Eichhornia crassipes</i>	Entire study area Particularly runoff and run-on areas	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Lycium ferocissimum</i>	Entire study area Particularly disturbed ground	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Parkinsonia aculeata</i>	Entire study area all soil types	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Parthenium hysterophorus</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Implement Weed Management Recommendations ( <b>Section 3.5.3</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.2 FLORA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Other Introduced Species</b>	<i>Sporobolus jacquemontii</i>	Entire study area particularly areas receiving surface water runoff	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Possible	Short Term	Significant	Very Unlikely	Short Term	Negligible	High
	<i>Pennisetum ciliaris</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Probable	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High
	<i>Eragrostis curvula</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Probable	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High
	<i>Megathyrus maximus</i>	Entire study area Particularly land zone 3	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Probable	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High
	<i>Verbena aristigera</i>	Entire study area Particularly land zones 4, 8 and 9	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with construction materials.  Increased water availability and nutrients from stormwater and construction water runoff.	Probable	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains RE 11.3.1 Also listed as Endangered under the VM Act	792 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects.	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains RE 11.3.2 (where supports Weeping Myall) Also listed as Of Concern under the VM Act	14729 ha of this vegetation community occurs within the study area, representing 9% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects.	Probable	Long Term	Moderate	Maintain 200 m buffer between operational activities and occurrences of Weeping Myall within this community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer of Weeping Myall through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrow-leaved Box (E. <i>plligensis</i> ), Brigalow ( <i>Acacia harpophylla</i> ), Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains RE 11.4.10 Also listed as Endangered under the VM Act	64 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects.	Probable	Long Term	Minor	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High

APPENDIX N  
TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities (cont.)	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains RE 11.4.3 Also listed as Endangered under the VM Act	4755 ha of this vegetation community occurs within the study area, representing 15% of this community within the broader region. Study area is of moderate- low importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects.	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains RE 11.4.7 Also listed as Endangered under the VM Act	292 ha of this vegetation community occurs within the study area, representing 9.5% of this community within the broader region. Study area is of moderate- low importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Moderate	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides RE 11.8.3	8 ha of this vegetation community occurs within the study area, representing 0.07% of this community within the broader region. Study area is of Negligible importance to this community.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Minor	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High

APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities (cont.)	Brigalow ( <i>Acacia harophylla</i> ) - Dawson Gum ( <i>E. cambageana</i> ) open forest to woodland on fine-grained sedimentary rocks RE 11.9.1 Also listed as Endangered under the VM Act	7 ha of this vegetation community occurs within the study area, representing 0.2% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Moderate	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Semi-evergreen vine thicket on fine grained sedimentary rocks RE 11.9.4 Also listed as Of Concern under the VM Act	3605 ha of this vegetation community occurs within the study area, representing 33% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Brigalow ( <i>Acacia harophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine-grained sedimentary rocks RE 11.9.5 Also listed as Endangered under the VM Act	10897 ha of this vegetation community occurs within the study area, representing 14% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Moderate	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High



APPENDIX N  
TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities (cont.)	Myall ( <i>Acacia melvillei</i> ) ± Brigalow ( <i>Acacia harpophylla</i> ) open forest on fine-grained sedimentary rocks RE 11.9.6 Also listed as Endangered under the VM Act	118 ha of this vegetation community occurs within the study area, representing 32% of this community within the broader region. Study area is of high - moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
<b>State Significant Regional Ecosystems</b> Endangered REs	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains RE 11.4.12	1183 ha of this vegetation community occurs within the study area, representing 27% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Black Tea-tree ( <i>Melaleuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities RE 11.4.3a	4 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High

# APPENDIX N

## TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Regional Ecosystems/ Of Concern REs	Poplar Box ( <i>Eucalyptus populinea</i> ) woodland with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on alluvial plains RE 11.3.17 (also listed as Endangered Biodiversity Status under the VM Act)	86 ha of this vegetation community occurs within the study area, representing 2% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Minor	Maintain 200 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project	Unlikely	Long Term	Negligible	High
	Coolibah ( <i>Eucalyptus coolibah</i> ) woodland on alluvial plains RE 11.3.3	729 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Minor	Maintain 100 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Operations Environmental Management Plan for the Project	Unlikely	Long Term	Negligible	High
	Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and/ or Eucalyptus spp. tall woodland on alluvial plains RE 11.3.4	2596 ha of this vegetation community occurs within the study area, representing 19% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Moderate	Maintain 100 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Operations Environmental Management Plan for the Project	Unlikely	Long Term	Minor	High
	Poplar Box ( <i>Eucalyptus populinea</i> ). False-sandalwood ( <i>Eremophila mitchellii</i> ) shrubby woodland on fine-grained sedimentary rocks RE 11.9.7	2375 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Minor	Maintain 100 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Operations Environmental Management Plan for the Project	Unlikely	Long Term	Negligible	High

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Regional Ecosystems Of Concern REs (cont.)	Brigalow ( <i>Acacia harpophylla</i> ) and Poplar Box ( <i>Eucalyptus populnea</i> ) open forest on fine-grained sedimentary rocks RE 11.9.10	3140 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Minor	Maintain 100 m buffer between operational activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 100m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
<b>Other Remnant Vegetation</b> Least Concern REs at the limit of their distribution	Black Box Open Forest RE 11.3.16 (Northerly extent)	73 ha of these vegetation communities occur within the study area, representing 100% of these communities within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Significant	Maintain 200 m buffer between operational activities and mapped vegetation community, or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire management guidelines, for works within a 200m buffer through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
<b>Other Remnant Vegetation</b> Least Concern REs	REs 11.3.14, 11.3.16, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.5.1, 11.5.4, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.9, 11.10.1, 11.10.9, 11.10.3, 11.10.7, 11.10.11 & 11.10.13	525612 ha of these vegetation communities occur within the study area, representing 21.7% of these communities within the broader region.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Probable	Long Term	Moderate	Implement relevant components of the Habitat Management Plan ( <b>Section 3.5</b> ), including weed management and ecological fire management, through the Operations Environmental Management Plan for the Project where these communities occur adjacent to operations activities.	Unlikely	Long Term	Negligible	High
<b>Non-Remnant Vegetation</b> Regrowth	Analogous to a range of RE types	37, 675 ha of these vegetation communities occur within the study area.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire- increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities. For those communities with more closed canopies (SEVT & Brigalow), decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Long Term	Minor	Implement relevant components of the Habitat Management Plan ( <b>Section 3.5</b> ), including weed management and ecological fire management, through the Operations Environmental Management Plan for the Project where these communities occur adjacent to operational activities.	Unlikely	Long Term	Negligible	High

APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Cleared areas not required for operational purposes</b>	Composed of all RE types disturbed	Approximately one third of all initial clearing.	Rehabilitation and vegetation enhancement areas will be vulnerable to weed invasion and cattle damage.	n/a	n/a	n/a	Manage in accordance with Rehabilitation and Revegetation Management Guidelines (Section 3.5.5) through the Operations Environmental Management Plan for the Project.	n/a	n/a	n/a	n/a
<b>Nationally Significant Flora</b> EPBC Act Endangered	<i>Microcarpaea</i> <i>Microcarpaea agonis</i> (also listed as Endangered under the NC Act)	Restricted to the Goondiwindi – Millmerran area in southern Queensland. Total of one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 200m of construction activities as per habitat management guidelines (Section 3.5), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Slender <i>Tylophora</i> <i>Tylophora linearis</i> (also listed as Endangered under the NC Act)	Total of one (1) database record for this species. Widely distributed outside of the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 200m of construction activities as per habitat management guidelines (Section 3.5), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Herbaceous <i>Xerothermella</i> <i>Xerothermella herbacea</i> (also listed as Endangered under the NC Act)	Restricted to the Chinchilla – Goondiwindi region of southern Queensland. Total of nine database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of construction activities as per habitat management guidelines (Section 3.5), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Nationally Significant Flora</b> EPBC Act Vulnerable	<i>Chinchilla Wattie</i> <i>Acacia chinchillensis</i> (also listed as Near Threatened under the NC Act)	Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Total of 61 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of construction activities as per habitat management guidelines (Section 3.5), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Curly-barked Wattle <i>Acacia curranii</i> (also listed as Vulnerable under the NC Act)	Restricted to Gurumundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. Total of 27 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Tara Wattle <i>Acacia laeta</i> (also listed as Vulnerable under the NC Act)	Restricted to the Inglewood – Tara region in the Darling Downs district of southern Queensland. Total of 8 database record for this species. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Moderate	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Wardell's Wattle <i>Acacia wardellii</i> (also listed as Vulnerable under the NC Act)	Restricted to south of Roma, south-west of Chinchilla and the Thomby Range, near Surat, south- eastern Queensland. Total of 13 database record for this species. The study area is of moderate - high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Ooline <i>Cadellia pentastylis</i> (also listed as Vulnerable under the NCA)	Known to occur within Wolleebee tenement, between Jackson-Wandoan Road and Gurumundi State Forest. Widely distributed outside of the study area, 15 database record. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Moderate	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Gurumundi Fringe Myrtle <i>Calytrix gurumundensis</i> (also listed as Vulnerable under the NC Act)	Restricted to the Gurumundi, Guluguba and Barakula area in south- eastern Queensland. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Pine Donkey-orchid <i>Duris tricolor</i>	Restricted to coastal ranges eastern Australia, from south-east Queensland to the New South Wales - Victoria border. Total of 7 database records, the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Shiny-leaved Ironbark <i>Eucahyptus virens</i> (also listed as Vulnerable under the NC Act)	Restricted to four disjunct localities near Mt Moffatt in the Carnarvon area, Browinia area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland. Total of three database records, the study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Moderate	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Belson's Panic Grass <i>Homopholis belsonii</i> (also listed as Endangered under the NC Act)	Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales. Total seven database records the study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub- surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Moderate	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High



APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	a <i>Macrozamia</i> <i>Macrozamia lemniscata</i> (also listed as Vulnerable under the NC Act)	Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroom, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme north-western end (Belbala/Kentucky area) (QLD Herbarium records). Total of one (1) database record the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 574ha potential habitat (1% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium
	a <i>Waxflower</i> <i>Philothea sporadica</i> (also listed as Vulnerable under the NC Act)	Restricted to north of Tara approximately 12 km east of Kogan in the Darling Downs District, in south- eastern Queensland. Total of 31 database records the study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Dunmore Mint-bush <i>Prostanthera</i> sp. Dunmore (also listed as Vulnerable under the NC Act)	Restricted to near Millmerran in south-east Queensland. The study area is potentially of high importance to this species	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Cobar Greenhood Orchid <i>Pterostylis cobarensis</i>	Restricted to Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. Total 6 database records the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>State Significant Flora</b> NC Act Endangered	Keelbed Heath-myrtle <i>Micromyrtus carinata</i>	Restricted to a small area NW of Gurilmundi, in southern Queensland. Also known from 10km NW of Miles and an outlying population near westmar (Craig Eddie pers. Comm.). The study area is of high importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed managements guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
				Possible	Long Term	Moderate	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed managements guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Flora</b> NC Act Vulnerable	Red-soil Woolly Winklewort <i>Rutidosia lanata</i>	Restricted to the Darling Downs district of southern Queensland. Total of 10 database records the study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed managements guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
				Possible	Long Term	Minor	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium

APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Vulnerable (cont.)	Winged Nightshade <i>Solanum stenopterum</i>	Restricted to the Darling Downs and Burnett regions of southern Queensland and northwestern slopes of New South Wales. Total of 3 database records the Project is of moderate - low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 200m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Flora</b> NC Act Rare	Western Rosewood <i>Acacia spania</i>	Restricted to the Emerald district of central Queensland. Total 3 database records, the study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Scrub Wattle <i>Acacia tenuinervis</i>	Restricted to a few localities in south-eastern Queensland, from near Glenmorgan, north-west to Injune and east to just west of Monto. Total 40 database records the study area is of moderate - high importance to this species	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Significant	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Silky Cryptandra <i>Cryptandra ciliata</i>	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. Total of two (2) database records for this species. The study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Blake's Spikerush <i>Eleocharis blakeana</i>	Restricted to southern Queensland and northern New South Wales. Total 14 database records the study area is of moderate - low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Rare (cont.)	Plunkett Mallee <i>Eucalyptus curtisii</i>	Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains. Records from the Gurilmundi area – possibly occurs in Stones County Resource Reserve in Woleebee gas field. Total three (3) database records. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Wandering Fringe-rush <i>Fimbristylis vagans</i>	Western Darling Downs. Total nine database records the study area is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Swamp tea-tree <i>Melaleuca irbyana</i>	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known to occur in north-western portion of study area (Craig Eddie pers. comm.). Total of one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141ha potential habitat ( 0.5% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium
	Rainforest Cassia <i>Senna aculins</i>	Restricted to coastal regions of central Queensland and central New South Wales. Known from Gurilmundi State Forest. Known from Gurilmundi State Forest (Craig eddie pers. Comm.). Total of one (1) database record for this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Manage known habitat within 100m of operational activities as per habitat management guidelines ( <b>Section 3.5</b> ), particularly ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>BAMM Priority Non- EVR Species</b>	Myall <i>Acacia melvillei</i>	Occurs around Wandoan and Jondaryan. Frequent in Taroom Shire. The Project Area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Bowakka <i>Acacia microsperma</i>	Scattered in southern Old Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Yarran Wattle <i>Acacia ornamentalifolia</i>	Scattered in southern Old Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Eucalyptus suffulgens</i>	Fairly widespread but scattered distribution in south-eastern Queensland. Usually on hills and ranges from the Camarvon Range and Blackdown tableland south-eastwards to Isla Gorge, also on Callide Range near Biloela; endemic. Likely to occur within the extreme north-western portion of the study area (Fairview/Belba State Forest) (Craig Eddie pers. comm.). The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141 ha potential habitat (0.4% of study area extent and 0.03% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation; Decreased habitat quality through edge effects.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Nil	No disturbance - negligible Disturbance (offset by translocation) - Minor	Medium

APPENDIX N  
TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
BAMM Priority Non- EVR Species (cont.)	Diamond-fruited Ironbark <i>Eucalyptus thomb/ca</i>	Restricted distribution in Queensland from north-east of Eidsvold to near Karara. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Green Mallee <i>Eucalyptus viridis</i>	Very scattered and widespread in south-eastern Queensland. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Plains Picris <i>Picris barbarorum</i>	Uncommon in NSW, Vic & Qld. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring operational activities.	Possible	Long Term	Minor	Implement relevant components of Habitat Management Guidelines (Section 3.5) adjacent to operational activities through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High



APPENDIX N  
TABLE N.3 FLORA IMPACTS - OPERATIONS

Element and Status/ Qualification	Community / Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Introduced Species of State Significance</b> Declared Class 2 Pest under the LP Act	<i>Byrophyllum delagoensis</i> , <i>Eriocereus martini</i> , <i>Opuntia aurantiaca</i> , <i>Opuntia stricta</i> , <i>Opuntia tomentosa</i> , <i>Senecio madagascariensis</i> , <i>Baccharis halimifolia</i> , <i>Eichhornia crassipes</i> , <i>Lycium ferocissimum</i> , <i>Parkinsonia aculeata</i> , <i>Parthenium hysterophorus</i> , <i>Sporobolus jacquemontii</i>		Potential for introduction of weed propagules via vehicular movement and foot traffic.  Increased water availability and nutrients from stormwater and operational water runoff.	Possible	Long Term	Significant	Implement weed management guidelines ( <b>Section 3.5.3</b> ) through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>Other Introduced Species</b>	<i>Pennisetum ciliaris</i> , <i>Eragrostis curvula</i> , <i>Megathyrsus maximus</i> , <i>Verbena aristigera</i>		Potential for introduction of weed propagules via vehicular movement and foot traffic.  Increased water availability and nutrients from stormwater and operational water runoff.	Probable	Long Term	Moderate	Implement weed management guidelines ( <b>Section 3.5.3</b> ) through the Operations Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains RE 11.3.1 Also listed as Endangered under the VM Act	792 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains RE 11.3.2 (where supports Weeping Myall) Also listed as Of Concern under the VM Act	14729 ha of this vegetation community occurs within the study area, representing 9% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and Weeping Myall or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrow-leaved Box ( <i>E. pilligaensis</i> ), Brigalow ( <i>Acacia harpophylla</i> ), Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains RE 11.4.10 Also listed as Endangered under the VM Act	64 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains RE 11.4.3 Also listed as Endangered under the VM Act	4755 ha of this vegetation community occurs within the study area, representing 15% of this community within the broader region. Study area is of moderate-low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index	
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Mitigation and Compensatory Measures	Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
Nationally Significant Endangered Ecological Communities (cont.)	Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains RE 11.4.7 Also listed as Endangered under the VM Act	292 ha of this vegetation community occurs within the study area, representing 9.5% of this community within the broader region. Study area is of moderate-low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides RE 11.8.3	8 ha of this vegetation community occurs within the study area, representing 0.07% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	moderate	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Brigalow ( <i>Acacia harpophylla</i> ) - Dawson Gum ( <i>E. cambageana</i> ) open forest to woodland on fine-grained sedimentary rocks RE 11.9.1 Also listed as Endangered under the VM Act	7 ha of this vegetation community occurs within the study area, representing 0.2% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	moderate	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
		Semi-evergreen vine thicket on fine grained sedimentary rocks RE 11.9.4 Also listed as Of Concern under the VM Act	3605 ha of this vegetation community occurs within the study area, representing 33% of this community within the broader region. Study area is of Negligible importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Endangered Ecological Communities (cont.)	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine-grained sedimentary rocks RE 11.9.5 Also listed as Endangered under the VM Act	10897 ha of this vegetation community occurs within the study area, representing 14% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Myall ( <i>Acacia melvillei</i> ) ± Brigalow ( <i>Acacia harpophylla</i> ) open forest on fine-grained sedimentary rocks RE 11.9.6 Also listed as Endangered under the VM Act	118 ha of this vegetation community occurs within the study area, representing 32% of this community within the broader region. Study area is of high - moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
State Significant Regional Ecosystems Endangered REs	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains RE 11.4.12	1183 ha of this vegetation community occurs within the study area, representing 27% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects.	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Black Tea-tree ( <i>Mealeuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities RE 11.4.3a	4 ha of this vegetation community occurs within the study area, representing 25% of this community within the broader region. Study area is of high importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities and decreased community condition through physical edge effects (e.g. light, temperature, humidity) .	Probable	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 200m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index	
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Mitigation and Compensatory Measures	Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
State Significant Regional Ecosystems Of Concern REs	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on alluvial plains RE 11.3.17 (also listed as Endangered Biodiversity Status under the VM Act)	86 ha of this vegetation community occurs within the study area, representing 2% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Moderate	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Coolibah ( <i>Eucalyptus coolibah</i> ) woodland on alluvial plains RE 11.3.3	729 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Significant	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and / or Eucalyptus spp. tall woodland on alluvial plains RE 11.3.4	2586 ha of this vegetation community occurs within the study area, representing 19% of this community within the broader region. Study area is of low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Significant	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Poplar Box ( <i>Eucalyptus populnea</i> ). False-santalwood ( <i>Eremophila mitchellii</i> ) shrubby woodland on fine-grained sedimentary rocks RE 11.9.7	2375 ha of this vegetation community occurs within the study area, representing 4% of this community within the broader region. Study area is of moderate importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Significant	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
		Brigalow ( <i>Acacia harpophylla</i> ) and Poplar Box ( <i>Eucalyptus populnea</i> ) open forest on fine-grained sedimentary rocks RE 11.9.10	3140 ha of this vegetation community occurs within the study area, representing 6% of this community within the broader region. Study area is of moderate - low importance to this community.	<u>Direct:</u> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <u>Indirect:</u> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Significant	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Remnant Vegetation Least Concern REs at the limit of their distribution	Black Box Open Forest RE 11.3.16 (Northernly extent)	73 ha of these vegetation communities occur within the study area, representing 100% of these communities within the broader region.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Short Term	Significant	Maintain 100 m buffer between decommissioning activities and mapped vegetation community or Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines, for works within a 100m buffer through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
Other Remnant Vegetation Least Concern REs	REs 11.3.14, 11.3.16, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27, 11.3.39, 11.5.1, 11.5.4, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.9, 11.10.1, 11.10.9, 11.10.3, 11.10.7, 11.10.11 & 11.10.13	525612 ha of these vegetation communities occur within the study area, representing 21.7% of these communities within the broader region.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Long term	Moderate	Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines adjacent to work areas, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
Non-Remnant Vegetation Regrowth	Analogous to a range of RE types.	37, 675 ha of these vegetation communities occur within the study area.	<b>Direct:</b> Increased fire frequency and intensity reduces structural variation and encourages fire-increasing species such as Buffel Grass which suppress native forest regeneration. <b>Indirect:</b> Decreased condition and possible dieback of vegetation community through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Probable	Long term	Minor	Implement relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), particularly weed and fire mangement guidelines adjacent to work areas, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
Nationally Significant Flora EBPC Act Endangered	Microcarpaea <i>Microcarpaea agonis</i> (also listed as Endangered under the NC Act)	Restricted to the Goondiwindi – Millmerran area in southern Queensland. Total one (1) database record. The study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Slender <i>Tylophora linearis</i> (also listed as Endangered under the NC Act)	Total of one database record for this species. Widely distributed outside of the study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High



TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Endangered (cont.)	Herbaceous <i>Xerothamnella</i> <i>Xerothamnella herbacea</i> (also listed as Endangered under the NC Act)	Restricted to the Chinchilla – Goondiwindi region of southern Queensland. Total of nine database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
Nationally Significant Flora EPBC Act Vulnerable	Chinchilla Wattle <i>Acacia chinchillensis</i> (also listed as Near Threatened under the NC Act)	Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Total of 61 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Curly-barked Wattle <i>Acacia curranii</i> (also listed as Vulnerable under the NC Act)	Restricted to Gurulmundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. Total of 27 database record for this species. The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Tara Wattle <i>Acacia laula</i> (also listed as Vulnerable under the NC Act)	Restricted to the Inglewood – Tara region in the Darling Downs district of southern Queensland. Total of 8 database record for this species. The study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Wardell's Wattle <i>Acacia wardelli</i> (also listed as Vulnerable under the NC Act)	Restricted to south of Roma, south-west of Chinchilla and the Thornby Range, near Surat, south-eastern Queensland. Total of 13 database record for this species. The study area is of moderate - high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Ooline <i>Cadellia pentastylis</i> (also listed as Vulnerable under the NCA)	Known to occur within Wollabebe tenement, between Jackson-Wandoo Road and Gurulmundi State Forest. Widely distributed outside of the study area, 15 database record. The study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High
	Gurulmundi Fringe <i>Myrtle Calytrix</i> <i>gurulmundensis</i> (also listed as Vulnerable under the NC Act)	Restricted to the Gurulmundi, Guluguba and Barakula area in south-eastern Queensland. The study area is of high importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Very Unlikely	Short Term	Minor	High
	Pine Donkey-orchid <i>Diuris tricolor</i>	Restricted to coastal ranges eastern Australia, from south-east Queensland to the New South Wales - Victoria border. Total of 7 database records, the study area is of low importance to this species	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Very Unlikely	Short Term	Negligible	High
	Shiny-leaved Ironbark <i>Eucalyptus virens</i> (also listed as Vulnerable under the NC Act)	Restricted to four disjunct localities near Mt Moffatt in the Camarvon area, Brovinia area south of Mundubbera, Tara area west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland. Total of three database records, the study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High
	Belson's Panic Grass <i>Homopholis belsonii</i> (also listed as Endangered under the NC Act)	Restricted to Darling Downs region in southern Queensland to north-west slopes of northern New South Wales. Total seven database records the study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Very Unlikely	Short Term	Negligible	High

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Flora EPBC Act Vulnerable (cont.)	a. <i>Macrozamia fearnsidei</i> <i>Macrozamia fearnsidei</i> (also listed as Vulnerable under the NC Act)	Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroom, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme north-western end (Beilba/Kentucky area) (QLD Herbarium records). Total of one (1) database record the study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 574ha potential habitat ( 1% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, application to DEWHA and/or DERM for disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	a. <i>Waxflower</i> <i>Philothea sporadica</i> (also listed as Vulnerable under the NC Act)	Restricted to north of Tara Kogan in the Darling Downs District, in south-eastern Queensland. Total of 31 database records the study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Dunmore Mint-bush <i>Prostanthera</i> sp. Dunmore (also listed as Vulnerable under the NC Act)	Restricted to near Millmerran in south-east Queensland. The study area is potentially of high importance to this species	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Cobar Greenhood Orchid <i>Pterostylis cobarensis</i>	Restricted to Darling Downs in southern Queensland south to Nyngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. Total 6 database records the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Flora</b> NC Act Endangered	Keeled Heath-myrtle <i>Micromyrtus carinata</i>	Restricted to a small area NW of Gurulmundi, in southern Queensland. Also known form 10km NW of Miles and an outlying population near westmar (Craig Eddie pers. Comm.). The study area is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Flora NC Act Endangered (cont.)	Red-soil Woolly Winkletwort <i>Rutidosia lanata</i>	Restricted to the Darling Downs district of southern Queensland. Total of 10 database records the study area is of moderate importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Flora</b> NC Act Vulnerable	Gonocarpus <i>Gonocarpus urceolarius</i>	Restricted to the Chinchilla and Emerald districts of south-eastern and central Queensland. Total 17 database records the Project is of high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Significant	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Minor	High
	Bright Flat Sedge <i>Cyperus clarus</i>	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known from Palardo (west of Miles) within the Carinya tenement (Old Herbarium record). Total one (1) database record the Project is of low importance to this species.	<u>Direct:</u> Loss of approximately 64ha potential habitat ( 0.4% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long Term	Minor	Seasonal field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project if the species is located.  If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible  Disturbance (offset by translocation) - Minor	Medium
	Winged Nighthshade <i>Solanum stenapterum</i>	Restricted to the Darling Downs and Burnett regions of southern Queensland and northwestern slopes region of New South Wales. Total of 3 database records the Project is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 200m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact			Prediction Reliability Index	
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment		
State Significant Flora NC Act Rare	Western Rosewood <i>Acacia spania</i>	Restricted to the Emerald district of central Queensland. Total 3 database records, the study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 100m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Scrub Wattle <i>Acacia tenuinervis</i>	Restricted to a few localities in south-eastern Queensland, from near Glenmorgan, north-west to Injune and east to just west of Monto. Total 40 database records the study area is of moderate - high importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Moderate	Manage known habitat within 100m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Silky Cryptandra <i>Cryptandra ciliata</i>	Restricted to the Darling Downs ranges in southern Queensland and in northern New South Wales. Total of two (2) database records for this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 100m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
Element and	Blake's Spikerush <i>Eleocharis blakeana</i>	Restricted to southern Queensland and northern New South Wales. Total 14 database records the study area is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 100m of decommissioning activities as per Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
											Prediction

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

LEGEND	Species	Significance of study area	Impact Type	Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Mitigation and Compensatory Measures	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	Reliability Index
State Significant Flora NC Act Rare (cont.)	Plunkett Mallee <i>Eucalyptus curtisii</i>	Restricted to south-eastern Queensland, from Plunkett south of Beenleigh, west to Inglewood and north to the Glasshouse Mountains. Records from the Gurulmundi area – possibly occurs in Stones County Resource Reserve in Woleebee gas field. Total three (3) database records. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Construction Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Short Term	Negligible	High
	Wandering Fringe-rush <i>Fimbristylis vagans</i>	Western Darling Downs. Total nine database records the study area is of moderate - low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Construction Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Short Term	Negligible	High
	Swamp tea-tree <i>Melaleuca rhzyana</i>	Generally restricted to south-eastern Queensland and north-eastern New South Wales, but known to occur in north-western portion of study area (Craig Eddie pers. comm.). Total of one (1) database record. The study area is of low importance to this species.	<u>Direct:</u> Loss of approximately 141ha potential habitat ( 0.5% of study area extent and 0.1% of provincial extent). <u>Indirect:</u> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long term	Minor	Field survey within 200m of proposed disturbance and implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Construction Environmental Management Plan for the Project if the species is located. If disturbance is unavoidable, seek advice from DERM for conditions of disturbance. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004).	Very Unlikely	Nil	No disturbance - Negligible Disturbance (offset by translocation) - Minor	Medium
	Rainforest Cassia <i>Senna acclivis</i>	Restricted to coastal regions of central Queensland and central New South Wales. Known from Gurulmundi State Forest. Known from Gurulmundi State Forest (Craig eddie pers. Comm.). Total of one (1) database record for this species. The study area is of low importance to this species.	<u>Direct:</u> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <u>Indirect:</u> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Manage known habitat within 100m of decommissioning activities as per Habitat Management Guidelines (Section 3.5) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High



TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigated Impact				Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment	Mitigation and Compensatory Measures	Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>BAMM Priority Non-EVR Species</b>	<i>Acacia melvillei</i>	Occurs around Wandaan and Jondaryan. Frequent in Tanoom Shire. The study area is of moderate importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to decommissioning activities through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Bowyakka <i>Acacia microsperma</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to decommissioning activities through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Acacia omalophylla</i>	Scattered in southern Qld from Adavale SE to Talwood (near N.S.W. border). The study area is of Moderate - low importance to this species. The study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to decommissioning activities through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Eucalyptus suffulgens</i>	Fairly widespread but scattered distribution in south-eastern Queensland. Usually on hills and ranges from the Carnarvon Range and Blackdown tableland south-eastwards to Isla Gorge, also on Callide Range near Bloeba; endemic. Likely to occur within the extreme north-western portion of the study area (Fairview/Beilba State Forest) (Craig Eddle pers. comm.). The study area is of low importance to this species.	<b>Direct:</b> Loss of approximately 141 ha potential habitat (0.4% of study area extent and 0.03% of provincial extent). <b>Indirect:</b> Decreased population viability through isolation. Decreased habitat quality through edge effects.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Construction Environmental Management Plan for the Project.	Very Unlikely	Nil	No disturbance - negligible Disturbance (offset by translocation) - Minor	Medium

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
BAMM Priority Non-EVR Species (cont.)	<i>Eucalyptus rhombica</i>	Restricted distribution in Queensland from north-east of Eidsvoll to near Karara. The study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to decommissioning activities through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	<i>Eucalyptus viridis</i>	Very scattered and widespread in south-eastern Queensland. The study area is of low importance to this species.	<b>Direct:</b> Increased fire frequency and intensity encourages fire-increasing species such as Buffel Grass which may compete with the species and suppress regeneration. <b>Indirect:</b> Decreased condition and possible dieback of supporting vegetation communities through weed invasion, disease, excessive dust, altered surface and sub-surface hydrology and nutrient dynamics introduced through neighbouring decommissioning activities.	Possible	Short Term	Minor	Implement relevant components of Habitat Management Guidelines ( <b>Section 3.5</b> ) adjacent to decommissioning activities through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
<b>Declared Class 2 Pest under the LP Act</b>	<i>Bryophyllum delagoense</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Eriocereus martinii</i>	Entire study area Particularly in vegetation communities on land zone 9	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Opuntia aurotiaca</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Minor	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Opuntia stricta</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Minor	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Opuntia tomentosa</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Minor	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Senecio madagascariensis</i>	Entire study area Particularly in land zone 3	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	( <b>Section 3.5.3</b> ) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Declared Class 2 Pest under the LP Act (cont.)	<i>Baccharis halimifolia</i>	Entire study area Ponded surface waters	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Eichhornia crassipes</i>	Entire study area Particularly runoff and run-on areas	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Lycium ferocissimum</i>	Entire study area Particularly disturbed ground	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Parkinsonia aculeata</i>	Entire study area all soil types	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Also potential for importing weed propagules with decommissioning materials. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Parthenium hysterophorus</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
Other Introduced Species	<i>Sporobolus jacquemontii</i>	Entire study area particularly areas receiving surface water runoff	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Possible	Short Term	Significant	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Pennisetum ciliaris</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Probable	Short Term	Moderate	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Eragrostis curvula</i>	Entire study area	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Probable	Short Term	Moderate	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	<i>Megathyrsus maximus</i>	Entire study area Particularly land zone 3	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil. Increased water availability and nutrients from stormwater and decommissioning water runoff.	Probable	Short Term	Moderate	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.4 FLORA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Introduced Species (cont.)	<i>Verbena aristigera</i>	Entire study area Particularly land zones 4, 8 and 9	Potential for introduction of weed propagules via vehicular movement and foot traffic, particularly in areas of exposed soil.  Increased water availability and nutrients from stormwater and decommissioning water runoff.	Probable	Short Term	Moderate	Implement weed management guidelines (Section 3.5.3) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Fauna</b> EPBC Act Critically Endangered	Brigalow Woodland Snail Camaenidae BL13 (under submission to DEWHA for listing under the EPBC Act)	Five survey records. Study area is of very high importance to the species.	<u>Direct:</u> Potential loss of approximately 18ha potential habitat. <u>Indirect:</u> Increase in edge effects and subsequent negative impacts on habitat viability.	Possible	Long Term	Catastrophic	Undertake specific site surveys in potential habitat prior to development and subsequent avoidance of identified habitat. Apply threatened species management guidelines ( <b>Section 3.5</b> ) to 200m buffer area.	Very Unlikely	Long Term	Minor	Medium
	Dulacca Woodland Snail Camaenidae BL12 (under submission to DEWHA for listing under the EPBC Act)	All known records are from within the study area. Study area is of very high importance to the species.	<u>Direct:</u> Potential loss of approximately 2.5ha potential habitat. <u>Indirect:</u> Increase in edge effects and subsequent negative impacts on habitat viability.	Probable	Long Term	Significant	Undertake specific site surveys in potential habitat prior to development and subsequent avoidance of identified habitat. Apply threatened species management guidelines ( <b>Section 3.5</b> ) to 200m buffer area.	Possible	Long Term	Minor	Low
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Swift Parrot <i>Lathamus discolor</i> (also listed as Endangered under the NC Act)	Very occasional visitor, less than 10 known records. Study area of negligible importance.	<u>Direct:</u> Potential loss of approximately 772ha potential winter foraging habitat (0.27% of subregional extent) <u>Indirect:</u> nil	Very Unlikely	Long Term	Negligible	None recommended. However, mitigation and compensatory measures will be applied to relevant suitable habitat in regards to other conservation significant species.	Very Unlikely	Long Term	Negligible	High
	Adorned Delima <i>Delima torquata</i> (also listed as Vulnerable under the NC Act)	One record. Study area of low importance to the species.	<u>Direct:</u> Potential loss of approximately 1810ha potential habitat (0.14% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increase in edge effects. Increased access to habitat by feral predators and possible increased predation.	Very Unlikely	Long Term	Negligible	None recommended. However, mitigation and compensatory measures will be applied to relevant suitable habitat in regards to other conservation significant species.	Very Unlikely	Long Term	Negligible	Medium
<b>Nationally Significant Fauna</b> EPBC Act as Painted Snipe <i>R. berghelensis</i> s. lat )	Australian Painted Snipe <i>Rostratula australis</i> (also listed as Vulnerable under the NC Act and as Migratory under the EPBC Act as Painted Snipe <i>R. berghelensis</i> s. lat )	Probably annual though scarce visitor Study area of low importance to the species.	<u>Direct:</u> Potential loss of approximately 451ha potential habitat (0.11% of subregional extent). Species often occurs in non- remnant habitats. <u>Indirect:</u> Increased access to habitat by feral predators and possible increased predation. Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Possible	Long Term	Moderate	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular threatened species and feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium
	Black-breasted Button- quail <i>Turnix melanogaster</i> (also listed as Vulnerable under the NC Act)	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 58ha potential habitat (0.06% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators and increased predation. Reduced food resources through desiccation of leaf litter due to increased edge effects.	Unlikely	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular threatened species and feral animal management guidelines, through the Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Brigalow Scaly-foot <i>Paradelima orientalis</i> (also listed as Vulnerable under the NC Act)	Nineteen database and survey records. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 5623ha potential habitat (0.22% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators and possible increased predation.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing, threatened species and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate (offset required)	High
	Dunmall's Snake <i>Furina dunmali</i> (also listed as Vulnerable under the NC Act)	Six database records. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 3629ha potential habitat (0.35% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing, threatened species and feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Moderate (offset required)	Low
	Grey-headed Flying-fox <i>Pteropus</i> <i>poliocephalus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 1060ha of potential habitat (0.14% of subregional habitat). <u>Indirect:</u> nil	Unlikely	Long Term	Negligible	Implement individual threatened species management guidelines for works within a 200m buffer of identified habitat (Section 3.5.1).	Very Unlikely	Long Term	Negligible	High
	Large-eared Pied Bat <i>Chalinolobus dwyeri</i> (also listed as Vulnerable under the NC Act)	One database record. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 816ha potential habitat (0.11% of subregional extent). <u>Indirect:</u> nil	Very Unlikely	Long Term	Minor	Ground-truth for caves suitable for roosting and implement individual threatened species management guidelines for works within a 200m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Very Unlikely	Long Term	Negligible	Low
	Plains-wanderer <i>Pedionomus torquatus</i> (also listed as Vulnerable under the NC Act)	Four database records of uncertain location. Vagrant/very occasional visitor. Study area is of negligible importance.	<u>Direct:</u> Potential loss of non-remnant grasslands (pasture) which may provide habitat. <u>Indirect:</u> nil	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	Medium
	Red Goshawk <i>Erythrorhynchus</i> <i>radiatus</i> (also listed as Endangered under the NC Act)	Two database records, both pre- 1980. Very occasional visitor. Study area of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 5261ha potential habitat (0.23% of subregional extent). <u>Indirect:</u> Loss of prey species.	Very Unlikely	Long Term	Negligible	Implement individual threatened species management guidelines for works within a 200m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Very Unlikely	Long Term	Negligible	Medium



APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	South-eastern Long-eared Bat <i>Nyctophilus corbeni</i> (formerly <i>N. timoriensis</i> (listed as <i>Nyctophilus timoriensis</i> ) (also Vulnerable under the NC Act)	Eight database records. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 5436ha potential habitat (0.22% of subregional extent). <u>Indirect:</u> Mortality during clearing activities. Increased competition for roosting sites.	Probable	Long Term	Moderate	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and threatened species management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	Low
	Squatter Pigeon (southern subspecies) <i>Geophaps scripta</i> (also listed as Vulnerable under the NC Act)	Less than 10 database and survey records for study area. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 5075ha potential habitat (0.22% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Unlikely	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Yakka Skink <i>Egernia rugosa</i> (also listed as Vulnerable under the NC Act)	Four database records. Study area of high importance to the species.	<u>Direct:</u> Potential loss of approximately 5326ha potential habitat (0.23% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators. Mortality during clearing activities.	Certain	Long Term	Significant	Ground-truth for colonies and implement Individual Threatened Species Management Guidelines for works within a 200m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Moderate (offset required)	Medium
State Significant Fauna NC Act Endangered	Bullock Jewell <i>Hypocnysops piceata</i>	No database records. Study area of low importance to the species.	<u>Direct:</u> Potential loss of approximately 759ha potential habitat (0.21% of subregional extent). Mortality of larvae during clearing activities. <u>Indirect:</u> nil	Unlikely	Long Term	Minor	None recommended.	Unlikely	Long Term	Minor	Medium
	Grey Snake <i>Hemiaspis damelli</i>	Fourteen database records. Study area of high importance to the species.	<u>Direct:</u> Potential loss of approximately 675ha potential habitat (0.13% of subregional extent). Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Significant	Implement Individual Threatened Species Management Guidelines for works within a 200m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Moderate (offset required)	Medium

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
State Significant Fauna NC Act Vulnerable	Glossy Black-Cockatoo <i>Calyptrorhynchus lathami</i>	Uncommon. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 2730ha potential habitat (0.34% of subregional extent). <u>Indirect:</u> Increased competition for tree hollows used for nesting with other species displaced by clearing.	Certain	Long Term	Significant	Ground-truth for feed trees, including isolated trees and within non-remnant vegetation. Avoid loss of any identified food tree and of any large hollow- bearing trees.  Implement Individual Threatened Species Management Guidelines for works within a 200m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Moderate (offset required)	High
	Pale Imperial Hailstreak <i>Jaimevus eubulus</i>	Seven database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 104ha potential habitat (0.03% of subregional extent). Mortality of larvae during clearing activities. <u>Indirect:</u> nil	Certain	Long Term	Moderate	Implement Individual Threatened Species Management Guidelines for works within a 200m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Possible	Long Term	Minor	Medium
	Major Mitchell Cockatoo <i>Lophochroa leadbeateri</i>	Three records. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of non-remnant habitats, no particular habitat use in study area.	Unlikely	Long Term	Negligible	None recommended.	Unlikely	Long Term	Negligible	High
State Significant Fauna NC Act Rare or Near Threatened	Black-chinned Honeyeater <i>Melithreptus gularis</i>	Less than 10 database records. Very occasional visitor. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 5404ha potential habitat (0.22% of subregional extent). <u>Indirect:</u> Edge effects will benefit 'increaser' species such as Noisy Miner which disrupt foraging.	Unlikely	Long Term	Minor	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Unlikely	Long Term	Negligible	High
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Scarce visitor. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 386ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Possible	Long Term	Minor	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Possible	Long Term	Minor	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Common Death Adder <i>Acanthophis antarcticus</i>	Ten database records. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 1617ha potential habitat (0.13% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators. Increased likelihood of trampling by livestock due to increased access to habitat. Increased likelihood of Cane Toads and mortality from attempted predation. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Possible	Long Term	Moderate	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Cotton Pygmy-geose <i>Nelapus coromandelianus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 386ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands. Increased competition for tree hollows used for nesting with other species displaced by clearing.	Very Unlikely	Long Term	Minor	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High
	Golden-tailed Gecko <i>Strophurus taenicauda</i>	Common and widespread in study area. Endemic to bioregion. Study area is very important to the species.	<u>Direct:</u> Potential loss of approximately 5486ha potential habitat (0.24% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators.	Certain	Long Term	Significant	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Significant (offset required)	High
	Freckled Duck <i>Stictonetta naevosa</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 386 ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Very Unlikely	Long Term	Negligible	Avoid disturbance to relevant Nationally Significant, Endangered and Of Concern REs (137ha).  Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Grey Falcon <i>Falco hypoleucos</i>	Very occasional visitor, less than 10 known records. Study area is of negligible importance to the species.	<u>Direct:</u> Loss of non-remnant habitats, no particular habitat use in study area.	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Grey Goshawk <i>Accipiter novaehollandiae</i>	Three records from study area. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 249ha potential habitat (0.20% of subregional extent). <u>Indirect:</u> nil	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Lewin's Rail <i>Lewinia pectoralis</i>	Very occasional visitor, less than five known records. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 249ha potential habitat (0.22% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	Low
	Little Pied Bat <i>Chalinolobus picatus</i>	Twenty-three database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 5883ha potential habitat (0.24% of subregional extent). Mortality during clearing activities. <u>Indirect:</u> Increased competition for roosting sites.	Certain	Long Term	Significant	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate (offset required)	Medium
	Painted Honeyeater <i>Grantia picta</i>	Uncommon visitor. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 265 ha potential habitat (0.06% of subregional extent). <u>Indirect:</u> Edge effects will benefit 'increaser' species such as Noisy Miner which disrupt foraging.	Certain	Long Term	Moderate	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).	Possible	Long Term	Minor	High
	Rough Frog <i>Cyclorana verrucosa</i>	Generally sparse, may be common in suitable habitat. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 460ha potential habitat (0.11% of subregional extent). Mortality during clearing activities. <u>Indirect:</u> Increased access to habitat by feral predators. Any possible increase in feral Pigs will increase physical disturbance of wetlands. Any possible increase in Cane Toads may increase competition.	Certain	Long Term	Significant	Avoid disturbance to soil structure of low-lying areas of cracking clays.  Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat (Section 3.5.1).  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate (offset required)	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Square-tailed Kite <i>Lopholichtia isura</i>	Uncommon breeding resident. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 5285ha potential habitat (0.21% of subregional extent). <u>Indirect:</u> nil	Certain	Long Term	Significant	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Certain	Long Term	Moderate (offset required)	High
	Turquoise Parrot <i>Neophema pulchella</i>	Sparse. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 397ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Increased competition for tree hollows used for nesting with other species displaced by clearing.	Possible	Long Term	Minor	Implement Individual Threatened Species Management Guidelines for works within a 100m buffer of identified habitat ( <b>Section 3.5.1</b> ).	Possible	Long Term	Minor	High
	Wonga <i>Aspidites ramsayi</i>	Twenty database records. Known only from western section of study area. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 1950ha potential habitat (0.29% of subregional extent). Mortality during clearing activities. <u>Indirect:</u> Increased access to habitat by feral predators. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Moderate	Implement Individual Threatened Species Management Guidelines for works within a 100 m buffer of identified habitat ( <b>Section 3.5.1</b> ).  Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate (offset required)	High
Nationally Significant Fauna EPBC Act Migratory Terrestrial species	White-throated Needletail <i>Hirundapus</i> <i>caudacutus</i> & Fork-tailed Swift <i>Apus</i> <i>pacificus</i> (aerial species)	Non-breeding summer visitors. Study area is of low importance to both species.	<u>Direct:</u> nil Aerial species that occur over all habitats, including cleared land and infrastructure. <u>Indirect:</u> Possible decrease in suitable invertebrate prey species.	Possible	Long Term	Negligible	None recommended.	Possible	Long Term	Negligible	High
	Eastern Osprey <i>Pandion cristatus</i> (listed as Osprey <i>P.</i> <i>haliaetus</i> ) & White-bellied Sea- Eagle <i>Haliaeetus</i> <i>leucogaster</i> (raptors associated with waterbodies)	Eastern Osprey is a vagrant, study area is of negligible importance to this species. White- bellied Sea-Eagle is uncommon, study area is of low importance.	<u>Direct:</u> Potential loss of suitable larger natural waterbodies. Most likely at artificial waterbodies. <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Unlikely	Long Term	Minor	No impacts on large waterbodies.	Unlikely	Long Term	Negligible	High
	Rainbow Bee-eater <i>Merops ornatus</i>	Common and widespread. Occurs in all habitats, including cleared land and around infrastructure. Study area is of low importance.	<u>Direct:</u> Possible loss of suitable substrate for breeding, which is not dependent on vegetation. <u>Indirect:</u> Possible decrease in suitable invertebrate prey species.	Possible	Long Term	Minor	None recommended.	Possible	Long Term	Minor	High

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact		Prediction Reliability Index	
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration		Residual Impact Assessment
Nationally Significant Fauna EPBC Act Migratory Terrestrial species (cont.)	Rufous Fantail <i>Rhipidura rufifrons</i> , Satin Flycatcher <i>Myiagra cyanoleuca</i> & Black-faced Monarch <i>Monarcha melanopsis</i>	Total of 18 database records for the three species. Study area is of low importance to these species.	<u>Direct:</u> Loss of approximately 327ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> possible decrease in suitable invertebrate prey species.	Possible	Long Term	Minor	Avoid disturbance to relevant Nationally Significant, Endangered and Of Concern REs (78ha).	Possible	Long Term	Minor	High
	Eastern Great Egret <i>Ardea modesta</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 386ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Certain	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Cattle Egret <i>Ardea ibis</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of non-remnant grasslands (pasture) which may provide foraging habitat. <u>Indirect:</u> nil	Certain	Long Term	Negligible	None recommended.	Certain	Long Term	Negligible	High
Nationally Significant Fauna EPBC Act Migratory Wetland species	Glossy Ibis <i>Plegadis falcinellus</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 386ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Unlikely	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Pacific Golden Plover <i>Pluvialis fulva</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> nil - only likely in non-remnant vegetation fringing artificial waterbodies <u>Indirect:</u> nil	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Latham's Snipe <i>Gallinago hardwickii</i>	Probably annual though scarce visitor. Study area of low importance to the species.	<u>Direct:</u> Potential loss of approximately 386ha potential habitat (0.13% of subregional extent). Species often occurs in non-remnant habitats. <u>Indirect:</u> Increased access to habitat by feral predators and possible increased predation. Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Possible	Long Term	Moderate	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Black-tailed Godwit <i>Limosa limosa</i> , Bar- tailed Godwit <i>L.</i> <i>lapponica</i> & Whimbrel <i>Numenius phaeopus</i> (large sandpipers)	Four database records in total. Study area is of negligible importance to these three species.	<u>Direct:</u> nil - most likely at artificial waterbodies <u>Indirect:</u> nil	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Common Greenshank <i>Tringa nebularia</i> , Marsh Sandpiper <i>T.</i> <i>stagnatilis</i> , Wood Sandpiper <i>T. glareola</i> , Common Sandpiper <i>Actitis hypoleucos</i> , Red-necked Stint <i>Calidris ruficollis</i> , Sharp-tailed Sandpiper <i>C. acuminata</i> , Curlew Sandpiper <i>C.</i> <i>ferruginea</i> & Ruff <i>Philomachus pugnax</i> (small to medium-sized sandpipers)	Seven, 10 and 17 database records for Common Greenshank, Marsh Sandpiper and Sharp tailed Sandpiper, respectively. Three or less database records for each of the other species. Uncommon or very occasional visitors. Study area is of low importance to these species.	<u>Direct:</u> Potential loss of suitable larger natural waterbodies. Most likely at artificial waterbodies. <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Unlikely	Long Term	Minor	No impacts on large waterbodies.	Unlikely	Long Term	Negligible	High
	Caspian Tern <i>Hydroprogne caspia</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of suitable larger natural waterbodies. Most likely at artificial waterbodies. <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Very Unlikely	Long Term	Negligible	No impacts on large waterbodies.	Very Unlikely	Long Term	Negligible	High
	Australian Reed- Warbler <i>Acrocephalus</i> <i>australis</i> (listed as Cinnamon Reed-Warbler <i>A.</i> <i>stenotereus</i> )	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of less than one ha potential habitat (0.01% of subregional extent). <u>Indirect:</u> Any possible increase in feral Pigs will increase physical disturbance of wetlands.	Possible	Long Term	Negligible	None recommended.	Possible	Long Term	Negligible	High



APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Regionally Significant Species</b> Non-EVR Priority Species	Barking Owl <i>Ninox corniens</i> & Masked Owl <i>Tyto novae-hollandiae</i> (medium to large-sized forest owls)	Barking Owl is uncommon and Masked Owl is known from five database records. Study area is of low importance to these species.	<u>Direct:</u> Potential loss of approximately 5453ha potential habitat (0.24% of subregional extent) for Barking Owl. Potential loss of approximately 403ha potential habitat (0.10% of subregional extent) for Masked Owl. <u>Indirect:</u> Increased competition for tree hollows used for nesting with other species. Decreased prey abundance due to possible increased predation by feral species and loss of habitat displaced by clearing.	Certain for Barking Owl  Unlikely for Masked Owl	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable for Barking Owl  Unlikely for Masked Owl	Long Term	Minor	High
	Brown Treecreeper <i>Climacteris picumnus</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 400ha potential habitat (0.12% of subregional extent). <u>Indirect:</u> Increased competition for tree hollows used for nesting with other species.	Certain	Long Term	Minor	Avoid riparian areas, limit removal of coarse woody debris and retain hollow-bearing trees.  Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Brush-tailed Phascogale <i>Phascogale tapoatafa</i> & Narrow-nosed Planigale <i>Planigale tenuirostris</i> (small to medium-sized dasyurids)	Four database records of Brush- tailed Phascogale and 44 database records of Narrow- nosed Planigale. Study area is of low importance to both species.	<u>Direct:</u> Potential loss of approximately 5276 ha potential habitat (0.23% of subregional extent) for Brush-tailed Phascogale. Potential loss of approximately 465ha potential habitat (0.11% of subregional extent) for Narrow-nosed Planigale. <u>Indirect:</u> Increased access to habitat by feral predators. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Moderate	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible for Brush- tailed Phascogale  Probable for Narrow-nosed Planigale	Long Term	Minor	Medium
	Bush Stone-curlew <i>Burhinus grallarius</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 1022ha potential habitat (0.12% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Probable	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Carpentaria Snake <i>Cryptophis boschmai</i>	Twenty-three database records. Study area is of low importance to the species.	<u>Direct:</u> Loss of approximately 3774ha potential habitat (0.27% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators.	Probable	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	Medium

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont).	Common Brushtail Possum <i>Trichosurus vulpecula</i> & Common Ringtail Possum <i>Pseudocheirus peregrinus</i>	Common Brushtail Possum is uncommon but widespread. Common Ringtail Possum is known from five database records. Study area of moderate importance to Common Brushtail Possum and of negligible importance to Common Ringtail Possum.	<u>Direct:</u> Potential loss of approximately 3852ha potential habitat (0.23% of subregional extent) for Common Brushtail Possum. Potential loss of approximately zero ha potential habitat for Common Ringtail Possum. <u>Indirect:</u> Mortality during clearing activities. Increased access to habitat by feral predators. Increased competition for tree hollows for Common Brushtail Possum.	Certain for Common Brushtail Possum  Very Unlikely for Common Ringtail Possum	Long Term	Minor for Common Brushtail Possum  Negligible for Common Ringtail Possum	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain for Common Brushtail Possum  Very Unlikely for Common Ringtail Possum	Long Term	Minor for Common Brushtail Possum  Negligible for Common Ringtail Possum	High
	Diamond Firetail <i>Stagonoleura guttata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 515ha potential habitat (0.17% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Possible	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Eastern Grass Owl <i>Tyto longimembris</i>	Four database records for the search area. No records for the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of non-remnant grasslands (pasture) which may provide foraging habitat. <u>Indirect:</u> Increased access to habitat by feral predators.	Very Unlikely	Long Term	Negligible	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	Medium
	Eastern Pebble-mouse <i>Pseudomys patris</i>	Two database or survey records. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 1723ha potential habitat (0.16% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Possible	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	Low
	Eastern Water Dragon <i>Physignathus lesueurii</i>	Twenty-nine database records. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 76ha potential habitat (0.1% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Possible	Long Term	Minor	Avoid permanent watercourses and their riparian vegetation. Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Friilled Lizard <i>Chlamydosaurus kingii</i>	Six database records. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 3842 ha potential habitat (0.24% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Unlikely	Long Term	Negligible	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Regionally Significant Species Non-EVR Priority Species (cont).	Grey-crowned Babbler <i>Pomastornus temporalis</i> & White-browed Babbler <i>P. superciliosus</i>	Grey-crowned Babbler is common, study area of moderate importance. White-browed Babbler is sparse, study area of low importance.	<u>Direct:</u> Potential loss of approximately 5883 ha potential habitat (0.21% of subregional extent) for Grey-crowned Babbler. Potential loss of approximately 4049 ha potential habitat (0.30% of subregional extent) for White-browed Babbler. <u>Indirect:</u> Increased access to habitat by feral predators.	Certain	Long Term	Minor for Grey-crowned Babbler Negligible for White-browed Babbler	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor for Grey-crowned Babbler Negligible for White-browed Babbler	High
	Hooded Robin <i>Melanodryas cucullata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Loss of approximately 426ha potential habitat (0.13% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Certain	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Koala <i>Phascolarctos cinereus</i>	Uncommon. Study area of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 3852 ha potential habitat (0.23% of subregional extent). Potential increase in vehicle strike due to increase in road traffic. <u>Indirect:</u> Increased access to habitat by wild dog/dingo.	Certain	Long Term	Moderate	Monitor location of any road kills and undertake remedial action (signage, slow points, fencing). Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Leadern Delma <i>Delma plebeia</i>	20 records for database search area. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 48 ha potential habitat (0.11% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators. Increased predation by 'increaser' native species.	Possible	Long Term	Minor	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium
	Eastern Bentwing Bat <i>Miniopterus orianae oceanensis</i>	Six database records. Study area is of low importance to Eastern Bentwing Bat.	<u>Direct:</u> Potential loss of approximately 141 ha potential habitat (0.1% of subregional extent). Mortality during clearing activities. <u>Indirect:</u> Increased competition for roosting sites.	Unlikely	Long Term	Minor	Ground-truth for caves suitable for roosting, avoid disturbance.	Unlikely	Long Term	Negligible	Low
	Macquarie Turtle <i>Emydura macquarii</i> Broad-shelled Turtle <i>Macrochelodina expansa</i>	Less than 10 records of each in database search area. Study area is of low importance for Macquarie Turtle and of moderate importance for Broad-shelled Turtle.	<u>Direct:</u> Potential loss of approximately 249ha potential habitat (0.22% of subregional extent), habitat restricted to large waterbodies. <u>Indirect:</u> Increased access to habitat by feral predators.	Unlikely	Long Term	Minor	No impacts on permanent watercourses. Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Regionally Significant Species Non-EVR Priority Species (cont).	Northern Brown Bandicoot / <i>Isodon macrourus</i> Long-nosed Bandicoot <i>Perameles nasuta</i>	Six database records of Northern Brown Bandicoot, study area of low importance. Three database records of Long-nosed Bandicoot, not recorded from study area and study area of negligible importance.	<u>Direct:</u> Potential loss of approximately 2723ha potential habitat (0.38% of subregional extent) for Northern Brown Bandicoot. Potential loss of approximately 13ha potential habitat (0.06% of subregional extent) for Long-nosed Bandicoot. <u>Indirect:</u> Increased access to habitat by feral predators.	Possible for Northern Brown Bandicoot  Very Unlikely for Long-nosed Bandicoot	Long Term	Moderate for Northern Brown Bandicoot  Negligible for Long-nosed bandicoot	Implementation of relevant components of the habitat management guidelines (Section 3.5), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Possible for Northern Brown Bandicoot  Very Unlikely for Long-nosed Bandicoot	Long Term	Minor for Northern Brown Bandicoot  Negligible for Long-nosed Bandicoot	High
	Pale-headed Snake <i>Hoplocephalus bitorquatus</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 4825ha potential habitat (0.22% of subregional extent). Mortality during clearing activities. Barriers to movement created. <u>Indirect:</u> Increased access to habitat by feral predators. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate	High
	Pink-tongued Lizard <i>Cyclodomorphus gerrardi</i>	Five database records. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 513ha potential habitat (0.18% of subregional extent). Mortality during clearing activities. <u>Indirect:</u> Increased access to habitat by feral predators.	Unlikely	Long Term	Negligible	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Platypus <i>Ornithorhynchus anatinus</i>	Two database records. Study area is of negligible importance to the species.	<u>Direct:</u> Potential loss of approximately 249 ha potential habitat (0.22% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators.	Very Unlikely	Long Term	Negligible	No impacts on permanent watercourses.	Very Unlikely	Long Term	Negligible	High
	Rufous Bettong <i>Asiorypymus rufescens</i> & Black- striped Wallaby <i>Macropus dorsalis</i> (small to medium-sized macropods)	Uncommon. Study area of moderate importance to both species.	<u>Direct:</u> Potential loss of approximately 626ha potential habitat (0.07% of subregional extent) for Rufous Bettong. Potential loss of approximately 601ha potential habitat (0.17% of subregional extent) for Black-striped Wallaby. <u>Indirect:</u> Increased access to habitat by feral predators.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Regionally Significant Species Non-EVR Priority Species (cont).	Salmon-striped Frog <i>Limnodynastes sarmini</i>	Common in suitable habitat. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 476 ha potential habitat (0.10% of subregional extent). <u>Indirect:</u> Mortality during clearing activities. Increased access to habitat by feral predators. Any possible increase in feral Pigs will increase physical disturbance of wetlands. Any possible increase in Cane Toads may increase competition.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Moderate	High
	Shingle-back Tiliqua <i>Tiliqua rugosa</i>	Forty-six database and survey records. Study area is of low importance to the species.	<u>Direct:</u> Potential loss of approximately 3865ha potential habitat (0.27% of subregional extent). <u>Indirect:</u> Mortality during clearing activities. Increased access to habitat by feral predators.	Certain	Long Term	Minor	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Speckled Warbler <i>Cithronicola sagittata</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 3893ha potential habitat (0.24% of subregional extent). <u>Indirect:</u> Increased access to habitat by feral predators. Increased access to habitat by 'increaser' native species.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Spotted Black Snake <i>Pseudochis guttatus</i>	Fifty-eight database records. Study area is of high importance to the species.	<u>Direct:</u> Potential loss of approximately 2895ha potential habitat (0.29% of subregional extent). <u>Indirect:</u> Mortality during clearing activities. Increased access to habitat by feral predators. Increased likelihood of Cane Toads and mortality from attempted predation. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Unspotted Yellow-sided Ctenotus <i>Ctenotus ingrami</i>	Thirty-nine database and survey records. Study area of moderate importance to the species.	<u>Direct:</u> Potential loss of approximately 1333ha potential habitat (0.16% of subregional extent). <u>Indirect:</u> Mortality during clearing activities. Increased access to habitat by feral predators.	Certain	Long Term	Moderate	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	Medium

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Yellow-bellied Glider (southern subspecies) <i>Petaurus australis</i> <i>australis</i> - Squirrel Glider <i>Petaurus</i> <i>norfolcensis</i> & Greater Glider <i>Petauroides</i> <i>volans</i>	Uncommon. Study area is of moderate importance to these species.	<b>Direct:</b> Potential loss of approximately 4142ha potential habitat (0.25% of subregional extent) for Yellow-bellied Glider. Potential loss of approximately 400ha potential habitat (0.07% of subregional extent) for Squirrel Glider. Potential loss of approximately 5611ha potential habitat (0.22% of subregional extent) for Greater Glider. <b>Indirect:</b> Increased access to habitat by feral predators. Increased competition for tree hollows.	Certain	Long Term	Significant for Yellow-bellied and Greater Glider Moderate for Squirrel Glider	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
				Certain	Long Term	Significant		Certain	Long Term	Minor	High
Bioregional Corridors Brigalow Belt South Biodiversity Planning Assessment	State Corridors	Common in suitable habitat. Study area is of moderate importance to the species.	<b>Direct:</b> Potential loss of approximately 5446ha potential habitat (0.25% of subregional extent). Mortality during clearing activities. <b>Indirect:</b> Increased access to habitat by feral predators. Increased likelihood of Cane Toads and mortality from attempted predation. Decreased prey abundance due to possible increased predation by feral species and loss of habitat.	Certain	Long Term	Significant	Implementation of relevant components of the habitat management guidelines ( <b>Section 3.5</b> ), in particular clearing and feral animal management guidelines, through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
				Certain	Long Term	Significant		Unlikely	Medium Term	Significant positive impact	High
Regional Corridors	Regional Corridors	Regional corridors within the study area are of very high importance for fauna movement.	Creation of barriers to fauna movement. Predation of native fauna by increased presence of feral predators. Increased presence of native 'increaser species' leading to increased predation or disturbance to native fauna. Decreased colonization of regrowth. Lack of gene flow through metapopulations.	Certain	Long Term	Significant	Offsets within corridor areas ( <b>Section 3.6</b> ).	Unlikely	Medium Term	Moderate positive impact	High
				Certain	Long Term	Significant		Unlikely	Medium Term	Moderate positive impact	High

APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Feral Species of State Significance</b> Declared Class 2 Pest under the LP Act	Red Fox <i>Vulpes vulpes</i>	Common and widespread.	Increased access to habitat along clearing for roads, tracks and pipeline easements. Increased predation of fauna displaced by clearing.	Certain	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Dingo/dog <i>Canis lupus dingo/familiaris</i>	Common and widespread.	Increased access to habitat along clearing for roads, tracks and pipeline easements. Increased predation of fauna displaced by clearing.	Certain	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	(feral) Cat <i>Felis catus</i>	Common and widespread.	Increased access to habitat along clearing for roads, tracks and pipeline easements. Increased predation of fauna displaced by clearing.	Certain	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Certain	Long Term	Minor	High
	Rabbit <i>Oryctolagus cuniculus</i>	Occasional and localised.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores.	Possible	Long Term	Minor	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	(feral) Pig <i>Sus scrofa</i>	Common. Widespread in western study area and localised elsewhere.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores. Increased predation of fauna displaced by clearing.	Probable	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
<b>Other Feral Species</b> Non-native animals!	(feral) Goat <i>Capra hircus</i>	Generally absent. Some scattered records.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores.	Unlikely	Long Term	Minor	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Unlikely	Long Term	Negligible	High
	Cane Toad <i>Rhinella marina</i>	Occasional and widespread in the north of the study area. Occasional and localised in the central and eastern study area and absent in the south.	Increased access to habitat along clearing for roads, tracks and pipeline easements. Increased predation/competition with native frog species. Increased mortality of native frog-eating species through attempted predation.	Probable	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Asian House Gecko <i>Hemidactylus frenatus</i>	Known from Chinchilla. Possibly present in other towns in the area.	No impact.								High



APPENDIX N  
TABLE N.5 FAUNA IMPACTS - CLEARING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation and Compensatory Measures	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Unmitigated Impact Duration	Unmitigated Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Feral Species Non-native animals (cont.)	Rock Dove <i>Columba livia</i>	Largely restricted to settlements.	Increased opportunity for colonisation of cleared areas. Competition with native species for tree hollows.	Probable	Long Term	Minor	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Possible	Long Term	Negligible	High
	Spotted Turtle-Dove <i>Streptopelia chinensis</i>	Largely restricted to settlements.	Increased opportunity for colonisation of cleared areas.	Possible	Long Term	Minor	None recommended.	Unlikely	Long Term	Negligible	High
	Common Starling <i>Sturnus vulgaris</i>	Common around settlements. Sparse or patchy elsewhere in the study area.	Increased opportunity for colonisation of cleared areas. Competition with native species for tree hollows.	Probable	Long Term	Moderate	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Common Myna <i>Sturnus tristis</i>	Occasional and localised in central and eastern study area. Mostly on roads and in settlements.	Increased access to habitat along clearing for roads, tracks and pipeline easements. Competition with native species for tree hollows.	Probable	Long Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	House Sparrow <i>Passer domesticus</i>	Common in settlements.	Increased opportunity for colonisation of cleared areas.	Possible	Long Term	Minor	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Nutmeg Mannikin <i>Lonicura punctulata</i>	Three records. Very sparse and very localised.	Increased opportunity for colonisation of cleared areas.	Very Unlikely	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Minor	High
	House Mouse <i>Mus musculus</i>	Common to very common throughout study area.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores.	Probable	Long Term	Significant	Implement Feral Animal Management Guidelines ( <b>Section 3.5.4</b> ).	Possible	Long Term	Minor	High
	Black Rat <i>Rattus rattus</i>	Sparse.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores. Predation of eggs and nestlings.	Possible	Long Term	Moderate	Implement Feral Animal Management Guidelines ( <b>Section 3.5.4</b> ).	Possible	Long Term	Minor	High
	Brown Hare <i>Lepus capensis</i>	Sparse.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores.	Probable	Long Term	Minor	Implement Feral Animal Management Guidelines ( <b>Section 3.5.4</b> ).	Possible	Long Term	Negligible	High
	(feral) Horse <i>Equus caballus</i>	Common and localised in north of study area.	Increased opportunity for colonisation of cleared areas. Competition with native herbivores. Soil compaction and micro-habitat destruction.	Possible	Long Term	Moderate	Implement Feral Animal Management Guidelines ( <b>Section 3.5.4</b> ).	Unlikely	Long Term	Minor	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Fauna</b> EPBC Act Critically Endangered	Brigalow Woodland Snail Camaenidae BL13 (under submission to DEWHA for listing under the EPBC Act)	Five survey records. Study area is of very high importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuelload due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Low
<b>Nationally Significant Fauna</b> EPBC Act Endangered	Duliacca Woodland Snail Camaenidae BL12 (under submission to DEWHA for listing under the EPBC Act)	All known records are from within the study area. Study area is of very high importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Low
	Swift Parrot <i>Lathamus discolor</i> (also listed as Endangered under the NC Act)	Very occasional visitor, less than 10 known records. Study area of negligible importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to likely invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Negligible	None recommended. However, mitigation and compensatory measures will be applied to relevant suitable habitat in regards to other conservation significant species.	Very Unlikely	Short Term	Negligible	High
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Adorned Delma <i>Delma torquata</i> (also listed as Vulnerable under the NC Act)	One record. Study area of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources under stored equipment/building materials resulting in possible subsequent mortality. Increased fuel load due to likely invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Negligible	Maintain 200 m buffer between construction activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Australian Painted Shiipe <i>Rostratula</i> <i>australis</i> (also listed as Vulnerable under the NC Act and as Migratory under the EPBC Act as Painted Shiipe R. <i>benignialis</i> ss. <i>lat</i> )	Probably annual though scarce visitor. Study area of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion altering species composition of vegetation fringing waterbodies.	Possible	Short Term	Minor	Maintain a 200 m buffer between construction activities and mapped wetland community, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	Medium

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Black-breasted Button-quail <i>Turnix melanogaster</i> (also listed as Vulnerable under the NC Act)	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuelload due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Brigalow Scaly-foot <i>Paradidma orientalis</i> (also listed as Vulnerable under the NC Act)	Nineteen database and survey records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuelload due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.	Unlikely	Short Term	Negligible	High
	Dunmall's Snake <i>Furina dunmali</i> (also listed as Vulnerable under the NC Act)	Six database records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuelload due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.	Unlikely	Short Term	Negligible	Low
	Grey-headed Flying- fox <i>Pteropus poliocephalus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to foraging by light pollution. Disturbance to foraging by noise pollution. <u>Indirect:</u> nil	Unlikely	Short Term	Negligible	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Large-eared Pied Bat <i>Chalinolobus dwyeri</i> (also listed as Vulnerable under the NC Act)	One database record. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to foraging by light pollution. Disturbance to roosting/breeding by noise pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Low
	Plains-wanderer <i>Pedionomus torquatus</i> (also listed as Vulnerable under the NC Act)	Four database records of uncertain location. Vagrant/very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance light pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	Medium
	Red Goshawk <i>Erythrotriorchis radiatus</i>	Two database records, both pre- 1980. Very occasional visitor. Study area of negligible importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution.  <u>Indirect:</u> Disturbance of prey species by noise pollution and construction activities.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	Medium
	South-eastern Long- eared Bat <i>Nyctophilus</i> species formerly <i>N. timorensis</i> (listed as <i>Nyctophilus timorensis</i> ) (also listed as Vulnerable under the NC Act)	Eight database records. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire which could reduce the shrub layer. Increased fuel load due to invasion of wooded areas by Buffel Grass. Predation by predators when fleeing disturbance (by day).	Possible	Short Term	Minor	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	Low
	Squatter Pigeon (southern subspecies) <i>Geopelia scripta scripta</i> (also listed as Vulnerable under the NC Act)	Less than 10 database and survey records for study area. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Negligible	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Plan ( <b>Section 3.5</b> ), in particular weed management and ecological fire management.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Yakka Shink <i>Egernia rufogosa</i> (also listed as Vulnerable under the NC Act)	Four database records. Study area of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain a 200 m buffer between construction activities and any known colonies or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implement Vehicle Speed and Use Guidelines ( <b>Section 3.5</b> ).	Unlikely	Short Term	Negligible	Medium
<b>State Significant Fauna</b> NC Act Endangered	Bullock Jewell <i>Hypochrysoys piceata</i>	No database records. Study area of low importance to the species.	<u>Direct:</u> nil. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between construction activities and any large and mature Bullock woodland. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Grey Snake <i>Hemiaspis damelli</i>	Fourteen database records. Study area of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Mortality of prey species, especially frogs. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain a 200 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.	Unlikely	Short Term	Negligible	Medium

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>State Significant Fauna</b> NC Act Vulnerable	Glossy Black- Cockatoo <i>Calyptrorhynchus latirostris</i>	Uncommon. Study area is of high importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire which could reduce food resources and/or stop recruitment of food trees. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between construction activities and known foraging area. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
	Pale Imperial Hairystreak <i>Jaflamenus eubulius</i>	Seven database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between construction activities and any Brigalow remnant. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	Medium
<b>State Significant Fauna</b> NC Act Rare or Near Threatened	Major Mitchell Cockatoo <i>Lophochroa leadbeateri</i>	Three records. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
	Black-chinned Honeyeater <i>Melliphreptus gularis</i>	Less than 10 database records. Very occasional visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Minor	Implement Ecological Fire Management Guidelines ( <b>Section 3.5.6</b> ) through the Construction Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Scarce visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of weed invasion.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Common Death Adder <i>Acanthophis antarcticus</i>	Ten database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of construction. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	High
	Cotton Pygmy-geese <i>Nettion coromandelianus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Golden-tailed Gecko <i>Strophurus taenicauda</i>	Common and widespread in study area. Endemic to bioregion. Study area is very important to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Freckled Duck <i>Sictonetta naevosa</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to foraging/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Grey Falcon <i>Falco hypoleucos</i>	Very occasional visitor, less than 10 known records. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High



APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Grey Goshawk <i>Accipiter novaehollandiae</i>	Three records from study area. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Negligible	Maintain 200 m buffer between construction activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Lewin's Rail <i>Lewinia pectoralis</i>	Very occasional visitor, less than five known records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between construction activities and mapped wetland community, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Low
	Little Pied Bat <i>Chalinolobus plicatus</i>	Twenty-three database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance to foraging by light pollution. Disturbance to roosting/breeding by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	Implement Stormwater and Wastewater None recommended. Will be included under the mitigation measures for Large-eared Pied Bat of the maintenance of a 200 m buffer between construction activities and any known caves, tunnels and mines.	Possible	Short Term	Minor	Medium
	Painted Honeyeater <i>Grantella picta</i>	Uncommon visitor. Study area is of high importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Reduction in food (fruit) quality by dust.	Possible	Short Term	Moderate	Maintain a 100 m buffer between construction activities and areas of Brigalow infested with mistletoe. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Construction Environmental Management Plan for the Project. Implement Dust Suppression Procedures.	Possible	Short Term	Minor	High
	Rough Frog <i>Cyclorana verrucosa</i>	Generally sparse, may be common in suitable habitat. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance to breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Competition with Cane Toads in disturbed areas and around waterbodies created as part of construction.	Possible	Short Term	Moderate	Maintain a 100 m buffer between construction activities and mapped wetland community and/or gilgals or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management and vehicle speed and use guidelines, through the Construction Environmental Management Plan for the Project. Fauna spotter/catcher to monitor trenches and other excavations.	Possible	Short Term	Minor	High
							Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter. Implement Stormwater and Wastewater Management Plan.				

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Square-tailed Kite <i>Lopholictia isura</i>	Uncommon breeding resident. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), including weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Turquoise Parrot <i>Neophema pulchella</i>	Sparse. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
Nationally Significant Fauna EPBC Act Migratory Terrestrial species	Woma <i>Aspides ramsayi</i>	Twenty database records. Known only from western section of study area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	White-throated Needletail <i>Hirundapus halaetus</i> & <i>caudatus</i> Fork-tailed Swift <i>Apus pacificus</i> (aerial species)	Non-breeding summer visitors. Study area is of low importance to both species.	<u>Direct:</u> nil <u>Indirect:</u> Disturbance to aerial foraging by dust.	Very Unlikely	Short Term	Negligible	Implement Dust Suppression Procedures.	Rare	Short Term	Negligible	High
	Eastern Osprey <i>Pandion cristatus</i> (listed as Osprey <i>P. halaetus</i> ) & White-bellied Sea- Eagle <i>Haliaeetus leucogaster</i> (raptors associated with waterbodies)	Eastern Osprey is a vagrant. White- bellied Sea-Eagle is uncommon. Study area is of negligible importance to Eastern Osprey and of low importance to White-bellied Sea- Eagle.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ). Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Terrestrial species (cont.)	Rainbow Bee-eater <i>Merops ornatus</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	None recommended.	Possible	Short Term	Minor	High
	Rufous Fantail <i>Rhipidura rufifrons</i> , Satin Flycatcher <i>Myiagra cyanoleuca</i> & Black-faced Monarch <i>Monarchia melanopsis</i>	Total of 18 database records for the three species. Study area is of low importance to these species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> nil	Unlikely	Short Term	Negligible	None Recommended.	Unlikely	Short Term	Negligible	High
Nationally Significant Fauna EPBC Act Migratory Wetland species	Eastern Great Egret <i>Ardea modesta</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Possible	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ). Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High
	Cattle Egret <i>Ardea ibis</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to foraging by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	None recommended.	Possible	Short Term	Minor	High
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Glossy Ibis <i>Plegadis falcinellus</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ). Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
	Pacific Golden Plover <i>Pluvialis fulva</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Latham's Snipe <i>Gallinago hardwickii</i>	Probably annual though scarce visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion altering species composition of vegetation fringing waterbodies.	Possible	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	Medium
	Black-tailed Godwit <i>Limosa limosa</i> , Bar- tailed Godwit L. <i>lapponica</i> & Whimbrel <i>Numenius phaeopus</i> (large sandpipers)	Four database records in total. Study area is of negligible importance to these three species.	<u>Direct:</u> Disturbance to foraging by noise pollution. Study area is of <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
	Caspian Tern Hydroprogne caspia	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ).  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High
	Common Greenshank <i>Tringa nebularia</i> , Marsh Sandpiper <i>T.</i> <i>stagnatilis</i> , Wood Sandpiper <i>T.</i> <i>glareola</i> , Common Sandpiper <i>Actitis hypoleucos</i> , Red-necked Stint <i>Calidris ruficollis</i> , Sharp-tailed Sandpiper <i>C.</i> <i>acuminata</i> , Curlew Sandpiper <i>C.</i> <i>ferruginea</i> & Ruff <i>Philomachus pugnax</i> (small to medium- sized sandpipers)	Seven, 10 and 17 database records for Common Greenshank, Marsh Sandpiper and Sharp tailed Sandpiper, respectively. Three or less database records for each of the other species. Uncommon or very occasional visitors. Study area is of low importance to these species.	<u>Direct :</u> Disturbance to foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ).  Implement Stormwater and Wastewater Management Plan.	Unlikely			

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Australian Reed- Warbler <i>Acrocephalus australis</i> (listed as Clamorous Reed-Warbler A. <i>stentoreus</i> )	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off leading to replacement of fringing vegetation with unsuitable species.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between construction activities and mapped wetland community, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
<b>Non-EVR Priority Species</b>	Barking Owl <i>Ninox connexus</i> & Masked Owl <i>Tyto novaeollandiae</i> (medium to large- sized forest owls)	Barking Owl is uncommon and Masked Owl is known from five database records. Study area is of low importance to these species.	<u>Direct:</u> Disturbance to foraging/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Brown Treecreeper <i>Climacteris picumnus</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to foraging by noise pollution. <u>Indirect:</u> Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Brush-tailed Phascogale <i>Phascogale tapoatafa</i> & Narrow- nosed Planigale <i>Planigale tenuirostris</i> (small to medium- sized dasyurids)	Four database records of Brush- tailed Phascogale and 44 database records of Narrow- nosed Planigale. Study area is of low importance to the phascogale and of negligible importance to the planigale.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	Medium

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Bush Stone-curlew <i>Burhinus grallarius</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the <b>Habitat Management Guidelines</b> (Section 3.5), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Carpenteria Snake <i>Cryptophis boschmai</i>	Twenty-three database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the <b>Habitat Management Guidelines (Section 3.5)</b> , in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Medium
	Common Brushtail Possum <i>Trichosurus vulpecula</i> & Common Ringtail Possum <i>Pseudocheirus peregrinus</i>	Common Brushtail Possum is uncommon but widespread and study area is of moderate importance. Common Ringtail Possum known from five database records and study area is of negligible importance.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the <b>Habitat Management Guidelines (Section 3.5)</b> , in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Diamond Firetail <i>Stagonopleura guttata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Minor	Implementation of relevant components of the <b>Habitat Management Guidelines (Section 3.5)</b> , in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Eastern Grass Owl <i>Tyto longimembris</i>	Four database records for the search area. No records for the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased likelihood of weed invasion providing unsuitable groundcover.	Very Unlikely	Short Term	Negligible	Implementation of relevant components of the <b>Habitat Management Guidelines (Section 3.5)</b> , in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Eastern Pebble- mouse <i>Pseudomys patritus</i>	Two database or survey records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Low
	Eastern Water Dragon <i>Physignathus lesueurii</i>	Twenty-nine database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion leading to replacement of fringing vegetation with unsuitable species.	Very Unlikely	Short Term	Negligible	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Friilled Lizard <i>Chlamydosaurus kingii</i>	Six database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Grey-crowned Babbler <i>Pomatostomus temporalis</i> & White-browed Babbler <i>P. superciliatus</i>	Grey-crowned Babbler is common and White-browed Babbler is sparse. Study area is of moderate importance to Grey-crowned Babbler and of low importance to White- browed Babbler.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Probable	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Minor	High



APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)											
	Hooded Robin <i>Melanodryas curculata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Koala <i>Phascolarctos crineus</i>	Uncommon. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Leadern Delma <i>Delma plebeia</i>	20 records for database search area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	Medium
	Eastern Bentwing Bat <i>Miniopterus orianae oceanensis</i>	Six database records. Study area is of low importance to Eastern Bentwing Bat.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality.	Unlikely	Short Term	Minor	Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Will be included under the mitigation measures for Large-eared Pied Bat of the maintenance of a 200 m buffer between construction activities and any known caves, tunnels and mines.	Unlikely	Short Term	Minor	Low
	Macquarie Turtle <i>Emydura macquarii</i> Broad-shelled Turtle <i>Macrochelodina expansa</i>	Less than 10 records of each in database search area. Study area is of low importance for Macquarie Turtle and Broad-shelled Turtle.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Northern Brown Bandicoot <i>Isodon macrourus</i> Long-nosed Bandicoot <i>Perameles nasuta</i>	Six database records of Northern Brown Bandicoot, study area of low importance to species. Three database records of Long-nosed Bandicoot. Long- nosed Bandicoot not recorded from study area. Study area of negligible importance to species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Pale-headed Snake <i>Hoplocephalus bitorquatus</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Pink-tongued Lizard <i>Cyclodonomorphus gerrardi</i>	Five database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Negligible	Fauna spotter/catcher to monitor trenches and other excavations. Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Platypus <i>Ornithorhynchus anatinus</i>	Two database records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Rufous Bettong <i>Asiaphrynus rufescens</i> & Black- striped Wallaby <i>Macropus dorsalis</i> (small to medium- sized macropods)	Uncommon. Study area of moderate importance to both species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Salmon striped Frog <i>Limnodynastes salmini</i>	Common in suitable habitat. Study area is of moderate importance to the species.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by noise pollution. <b>Indirect:</b> Degradation of waterbodies by run-off. Increased likelihood of weed invasion leading to replacement of fringing vegetation with unsuitable species. Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of construction. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Shingle-back Tiliqua <i>Tiliqua rugosa</i>	Forty-six database and survey records. Study area is of low importance to the species.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <b>Indirect:</b> Shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Speckled Warbler <i>Cithronicola sagittata</i>	Common. Study area is of moderate importance to the species.	<b>Direct:</b> Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Spotted Black Snake <i>Pseudechis guttatus</i>	Fifty-eight database records. Study area is of high importance to the species.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <b>Indirect:</b> Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of construction. Shelter resources in open pipes and under stored equipment/building materials resulting in mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Significant	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Unspotted Yellow-sided Ctenotus <i>Ctenotus ingrami</i>	Thirty-nine database and survey records. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Medium
	Yellow-bellied Glider (southern subspecies) <i>Petaurus australis</i> Glider <i>Petaurus norfolcensis</i> & Greater Glider <i>Petauroides volans</i>	Uncommon. Study area is of moderate importance to these species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management and ecological fire management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Yellow-spotted Monitor <i>Varanus panoptes</i>	Common in suitable habitat. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Mortality by attempted predation of Cane Toads present in disturbed areas. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management, ecological fire and vehicle speed and use management guidelines, through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
<b>State Corridors</b> Southern Brigalow Belt Biodiversity Planning Assessment		State corridors within the study area are of very high importance for fauna movement.	Those species able to still use the corridor subsequent to clearing may find the construction activities too disturbing to cross gaps.  Predation of native fauna by increased presence of feral predators.  Increased presence of native 'increaser species' leading to increased predation or disturbance to native fauna.	Probable	Short Term	Minor	Implementation of rehabilitation and revegetation guidelines ( <b>Section 3.5.5</b> ) through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Minor	High

APPENDIX N

TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Regional Corridors</b> Southern Brigalow Belt Biodiversity Planning Assessment		Regional corridors within the study area are of very high importance for fauna movement.	Those species able to still use the corridor subsequent to clearing may find the construction activities too disturbing to cross gaps.  Predation of native fauna by increased presence of feral predators.  Increased presence of native 'increaser species' leading to increased predation or disturbance to native fauna.	Probable	Short Term	Minor	Implementation of rehabilitation and revegetation guidelines ( <b>Section 3.5.5</b> ) through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
	Red Fox <i>Vulpes vulpes</i>	Common and widespread.	Increased predation of fauna displaced by construction activities.	Probable	Short Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Moderate	High
	Dingo/dog <i>Canis lupus dingo/familiaris</i>	Common and widespread.	Increased predation of fauna displaced by construction activities.	Probable	Short Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Moderate	High
	(feral) Cat <i>Felis catus</i>	Common and widespread.	Increased predation of fauna displaced by construction activities.	Probable	Short Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Probable	Short Term	Moderate	High
	Rabbit <i>Oryctolagus cuniculus</i>	Occasional and localised.	No impact.				Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High
<b>Other Feral Species</b> Non-native animal	(feral) Pig <i>Sus scrofa</i>	Common. Widespread in western study area and localised elsewhere.	Possible increase in numbers around waterbodies created as part of construction.  Increased degradation of natural waterbodies.	Possible	Short Term	Significant	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Moderate	High
	(feral) Goat <i>Capra hircus</i>	Generally absent. Some scattered records.	No impact.				Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High
	Cane Toad <i>Rhinella marina</i>	Occasional and widespread in the north of the study area. Occasional and localised in the central and eastern study area and absent in the south.	Increased predation/competition with native frog species in disturbed areas and around waterbodies created as part of construction.  Increased mortality of native frog-eating species through attempted predation.	Possible	Short Term	Significant	Ensure no potential waterbodies are created that are suitable for breeding and implement vehicle checks to ensure the species is not accidentally transported to and within the study area.  Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan.	Possible	Short Term	Moderate (indirect offset - monitoring and research recommended)	High
	Asian House Gecko <i>Hemidactylus frenatus</i>	Known from Chinchilla. Possibly present in other towns in the area.	Colonization of infrastructure.	Possible	Short Term	Minor	Implementation of feral animal management guidelines (Section 3.5.4) through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

APPENDIX N  
TABLE N.6 FAUNA IMPACTS - CONSTRUCTION

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Feral Species Non-native animal (cont.)	Rock Dove <i>Columba livia</i>	Largely restricted to settlements.	No impact.				Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High
	Spotted Turtle-Dove <i>Streptopelia chinensis</i>	Largely restricted to settlements.	No impact.				None recommended.				High
	Common Starling <i>Sturnus vulgaris</i>	Common around settlements. Sparse or patchy elsewhere.	Colonization of tree hollows vacated by disturbed native fauna.	Possible	Short Term	Moderate	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Common Myna <i>Sturnus iris</i>	Occasional and localised in central and eastern study area. Mostly near roads and settlements.	Colonization of tree hollows vacated by disturbed native fauna.	Possible	Short Term	Moderate	Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	House Sparrow <i>Passer domesticus</i>	Common in settlements.	No impact.				Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High
	Nutmeg Mannikin <i>Lonchura punctulata</i>	Three ecords. Very sparse and very localised.	No impact.				None recommended.				High
	House Mouse <i>Mus musculus</i>	Common to very common throughout study area.	Accidental transportation by vehicles.	Possible	Short Term	Minor	Implement vehicle checks to ensure the species is not accidentally transported.  Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Black Rat <i>Rattus rattus</i>	Sparse.	No impact.				Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High
	Brown Hare <i>Lepus capensis</i> (feral) Horse <i>Equus caballus</i>	Sparse.  Common and localised in north of study area.	No impact.  No impact.				None recommended.  Implementation of feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Construction Environmental Management Plan for the Project.				High  High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Fauna</b> EPBC Act Critically Endangered	Brigalow Woodland Snail Camaenidae BL13 (under submission to DEWHA for listing under the EPBC Act)	Five survey records. Study area is of very high importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Maintain 200 m buffer between operational activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular weed and ecological fire management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Medium
	Dulaoca Woodland Snail Camaenidae BL12 (under submission to DEWHA for listing under the EPBC Act)	All known records are from within the study area. Study area is of very high importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Maintain 200 m buffer between operational activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular weed and ecological fire management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Low
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Swift Parrot <i>Lathamus discolor</i> (also listed as Endangered under the NC Act)	Very occasional visitor, less than 10 known records. Study area of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Dust coating blossom (food resource). Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Aggressive exclusion by native 'increaser' species.	Rare	Long Term	Negligible	None recommended. However, mitigation and compensatory measures will be applied to relevant suitable habitat in regards to other conservation significant species.	Very Unlikely	Long Term	Negligible	High
	Adorned Delma <i>Delma torquata</i> (also listed as Vulnerable under the NC Act)	One record. Study area of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Rare	Long Term	Negligible	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	Medium
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Australian Painted Snipe <i>Rostratula australis</i> (also listed as Vulnerable under the NC Act and as Migratory under the EPBC Act as Painted Snipe <i>R. benghalensis</i> s. lat.)	Probably annual though scarce visitor Study area of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion altering species composition of vegetation fringing waterbodies. Increased predation due to increased presence of feral species.	Possible	Long Term	Moderate	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Unlikely	Long Term	Minor	Medium



APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Black-breasted Burton- quail <i>Turnix melanogaster</i> (also listed as Vulnerable under the NC Act)	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<b>Direct:</b> Disturbance from noise pollution. Disturbance from light pollution. <b>Indirect:</b> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Unlikely	Long Term	Significant	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Brigalow Scaly-foot <i>Paradelma orientalis</i> (also listed as Vulnerable under the NC Act)	Nineteen database and survey records. Study area is of high importance to the species.	<b>Direct:</b> Mortality by vehicle collision. <b>Indirect:</b> Edge effects from adjacent disturbed areas. Increased likelihood of fire, possible direct mortality and loss of acacia food trees. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Significant	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Dunnall's Snake <i>Furina dunnalli</i> (also listed as Vulnerable under the NC Act)	Six database records. Study area is of high importance to the species.	<b>Direct:</b> Mortality by vehicle collision. <b>Indirect:</b> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Significant	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Low
	Grey-Headed Flying-fox <i>Pteropus poliocephalus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<b>Direct:</b> Disturbance from noise pollution. Disturbance from light pollution. <b>Indirect:</b> nil	Unlikely	Long Term	Negligible	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Large-eared Pied Bat <i>Chalinolobus dwyeri</i> (also listed as Vulnerable under the NC Act)	One database record. Study area of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Rare	Long Term	Negligible	Maintain a 200 m buffer between activities and any known caves, tunnels and mines. or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	Low
	Plains-wanderer <i>Pedionomus torquatus</i> (also listed as Vulnerable under the NC Act)	Four database records of uncertain location. Vagrant/very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from light pollution. <u>Indirect:</u> Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	Medium
	Red Goshawk <i>Erythrorchilus radiatus</i>	Two database records, both pre- 1980. Very occasional visitor. Study area of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas affecting prey species. Disturbance to prey species by increased predation/competition by feral species. Disturbance to prey species by increased predation by native 'increaser' species. Disturbance to prey species by aggressive exclusion by native 'increaser' species.	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	Medium
	South-eastern Long- eared Bat <i>Nyctophilus</i> species formerly <i>N.</i> <i>timorensis</i> (listed as <i>Nyctophilus</i> <i>timorensis</i> ) (also listed as Vulnerable under the NC Act)	Eight database records. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire which could reduce shrub layer. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased competition for tree hollows by feral species and 'increaser' species.	Possible	Long Term	Moderate	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	Low
	Squatter Pigeon (southern subspecies) <i>Geophaps scripta</i> <i>scripta</i> (also listed as Vulnerable under the NC Act)	Less than 10 database and survey records for study area. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased predation/competition due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Unlikely	Long Term	Minor	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Minor	High

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Yakka Skink <i>Egernia rugosa</i> (also listed as Vulnerable under the NC Act)	Four database records. Study area of high importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire which would reduce hollow log availability. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Maintain 200 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Medium
<b>State Significant Fauna</b> NC Act Endangered	Bullock Jewell <i>Hypocnysops piceata</i>	No database records. Study area of low importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire killing mature Buloke (Bullock) and suppressing recruitment. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Long Term	Moderate	Maintain a 200 m buffer between operation activities and any large and mature Buloke woodland, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Minor	Medium
	Grey Snake <i>Hemiaspis damelli</i>	Fourteen database records. Study area of high importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies affecting frog (prey species) population. Increased likelihood of fire destroying coarse woody debris cover. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Mortality due to attempted predation of Cane Toads in disturbed areas and around waterbodies created for operation.	Possible	Long Term	Significant	Maintain a 200 m buffer between operation activities and mapped wetland community to protect prey habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	Medium
<b>State Significant Fauna</b> NC Act Vulnerable	Glossy Black-Cockatoo <i>Calyptorhynchus lathami</i>	Uncommon. Study area is of high importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire which could reduce food resources and stop recruitment of food trees. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased competition for tree hollows by feral species and 'increaser' species.	Possible	Long Term	Significant	Maintain a 200 m buffer between operation activities and known foraging areas, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular ecological fire management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan to protect drinking water source.	Possible	Long Term	Minor	High
	Pale Imperial Hairstreak <i>Jaflenus eubulus</i>	Seven database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Long Term	Moderate	Maintain a 200 m buffer between operational activities and any Brigalow remnant, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire and weed management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Medium

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Slate Significant Fauna NC Act Vulnerable (cont.)	Major Mitchell Cockatoo <i>Lophochroa leadbeateri</i>	Three records. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Black-chinned Honeyeater <i>Meliphreptus gularis</i>	Less than 10 database records. Very occasional visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Reduction in forage quality by dust. Aggressive exclusion by native 'increaser' species.	Rare	Long Term	Minor	Maintain a 100 m buffer between operational activities and known habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular ecological fire management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Minor	High
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Scarce visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Long Term	Minor	Maintain a 100 m buffer between operational activities and mapped wetland habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular ecological fire management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Negligible	High
	Common Death Adder <i>Acanthophis antarcticus</i>	Ten database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Mortality due to attempted predation of Cane Toads in disturbed areas and around waterbodies created for operation. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Significant	Maintain a 100 m buffer between operational activities and mapped known habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Cotton Pygmy-geese <i>Natalapus coromandelianus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased competition for tree hollows by feral species and 'increaser' species.	Rare	Long Term	Moderate	Maintain a 100 m buffer between operational activities and mapped wetland habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Minor	High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Golden-tailed Gecko <i>Strophurus taenicauda</i>	Common and widespread in study area. Endemic to bioregion. Study area is very important to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire, increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species.	Possible	Long Term	Moderate	Maintain a 100 m buffer between operational activities and known habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Freckled Duck <i>Stictonetta naevosa</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Rare	Long Term	Moderate	Maintain a 100 m buffer between operational activities and mapped wetland habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Negligible	High
	Grey Falcon <i>Falco hypoleucos</i>	Very occasional visitor, less than 10 known records. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Grey Goshawk <i>Accipiter novaehollandiae</i>	Three records from study area. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas affecting prey species. Disturbance to prey species by increased predation/competition by feral species. Disturbance to prey species by increased predation by native 'increaser' species. Disturbance to prey species by aggressive exclusion by native 'increaser' species.	Rare	Long Term	Negligible	Maintain a 100 m buffer between operation activities and Semi-Evergreen Vine Thicket. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High
	Lewin's Rail <i>Lewinia pectoralis</i>	Very occasional visitor, less than five known records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion altering species composition of vegetation fringing waterbodies. Increased predation due to increased presence of feral species.	Rare	Long Term	Negligible	Maintain a 100 m buffer between operational activities and mapped wetland habitat. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Negligible	Low
	Little Pied Bat <i>Chalinolobus plicatus</i>	Twenty-three database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased competition for tree hollows by feral species and 'increaser' species.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Painted Honeyeater <i>Grantiella picta</i>	Uncommon visitor. Study area is of high importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Reduction in food (fruit) quality by dust. Increased predation due to increased presence of feral species. Aggressive exclusion by native 'increaser' species.	Possible	Long Term	Minor	Maintain a 100 m buffer between operation activities and areas of Brigalow infested with mistletoe. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.  Implement dust suppression procedures.	Unlikely	Long Term	Minor	High
	Rough Frog <i>Cyclorana verrucosa</i>	Generally sparse, may be common in suitable habitat. Study area is of high importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased predation/competition due to increased presence of feral species.	Possible	Long Term	Significant	Maintain a 100 m buffer between operation activities and mapped wetland communities. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	High
	Square-tailed Kite <i>Lopholichtia isura</i>	Uncommon breeding resident. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas affecting prey species. Disturbance to prey species by increased predation/competition by feral species. Disturbance to prey species by increased predation by native 'increaser' species. Disturbance to prey species by aggressive exclusion by native 'increaser' species.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Turquoise Parrot <i>Neophema pulchella</i>	Sparse. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Aggressive exclusion by native 'increaser' species. Increased competition for tree hollows by feral species and 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Unlikely	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Long Term	Minor	High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Slate Significant Fauna NC Act Rare or Near Threatened (cont.)	Woma <i>Aspidiles ramsayi</i>	Twenty database records. Known only from western section of study area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased competition for tree hollows by feral species and 'increaser' species.	Possible	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	White-throated Needletail <i>Hirundapus</i> <i>caudatus</i> & Fork-tailed Swift <i>Apus</i> <i>pacificus</i> (aerial species)	Non-breeding summer visitors. Study area is of low importance to both species.	<u>Direct:</u> nil <u>Indirect:</u> Disturbance to aerial foraging by dust.	Rare	Long Term	Negligible	Implement dust suppression procedures.	Rare	Long Term	Negligible	High
	Eastern Osprey <i>Pandion cristatus</i> (listed as Osprey <i>P. haliaetus</i> ) & White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i> (raptors associated with waterbodies)	Eastern Osprey is a vagrant. White-bellied Sea-Eagle is uncommon. Study area is of negligible importance to Eastern Osprey and of low importance to White-bellied Sea-Eagle.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Long Term	Minor	Maintain a 100 m buffer between operation activities and mapped wetland communities.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Long Term	Minor	High
Nationally Significant Fauna EPBC Act Migratory Terrestrial species	Rainbow Bee-eater <i>Merops ornatus</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Probable	Long Term	Minor	None recommended.	Probable	Long Term	Minor	High
	Rufous Fantail <i>Rhipidura rufifrons</i> , Satin Flycatcher <i>Myiagra cyaneoleuca</i> & Black-faced Monarch <i>Monarcha melanopsis</i>	Total of 18 database records for the three species. Study area is of low importance to these species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Aggressive exclusion by native 'increaser' species.	Unlikely	Long Term	Minor	None recommended.	Unlikely	Long Term	Minor	High
	Eastern Great Egret <i>Ardea modesta</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Probable	Long Term	Minor	Maintain a 100 m buffer between operation activities and mapped wetland communities.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	High
Nationally Significant Fauna EPBC Act Migratory Wetland species	Cattle Egret <i>Ardea ibis</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> nil	Possible	Long Term	Minor	None recommended.	Possible	Long Term	Minor	High



APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Glossy Ibis <i>Plegadis falcinellus</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Possible	Long Term	Minor	Maintain a 100 m buffer between operation activities and mapped wetland communities. or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	High
	Pacific Golden Plover <i>Pluvialis fulva</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Latham's Snipe <i>Gallinago hardwickii</i>	Probably annual though scarce visitor. Study area of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion altering species composition of vegetation fringing waterbodies. Increased predation due to increased presence of feral species.	Possible	Long Term	Moderate	Maintain 100 m buffer between operational activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Long Term	Minor	Medium
	Black-tailed Godwit <i>Limosa limosa</i> , Bar-tailed Godwit L. <i>lapponica</i> & Whimbrel <i>Numenius phaeopus</i> (large sandpipers)	Four database records in total. Study area is of negligible importance to these three species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Rare	Long Term	Negligible	None recommended.	Very Unlikely	Long Term	Negligible	High
	Common Greenshank <i>Tringa nebularia</i> , Marsh Sandpiper <i>T. stagnatilis</i> , Wood Sandpiper <i>T. glareola</i> , Common Sandpiper <i>Actitis hypoleucos</i> , Red-necked Stint <i>Calidris ruficollis</i> , Sharp-tailed Sandpiper <i>C. acuminata</i> , Curlew Sandpiper <i>C. ferruginea</i> & Ruff <i>Philomachus pugnax</i> (small to medium-sized sandpipers)	Seven, 10 and 17 database records for Common Greenshank, Marsh Sandpiper and Sharp-tailed Sandpiper, respectively. Three or less database records for each of the other species. Uncommon or very occasional visitors. Study area is of low importance to these species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Possible	Long Term	Minor	Maintain a 100 m buffer between operation activities and mapped wetland communities. or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Caspian Tern <i>Hydroprogne caspia</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Rare	Long Term	Negligible	Maintain a 100 m buffer between operation activities and mapped wetland communities. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Negligible	High
	Australian Reed-Warbler <i>Acrocephalus australis</i> (listed as Cinnamon Reed-Warbler A. <i>stentoreus</i> )	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Degradation of fringing vegetation by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Maintain a 100 m buffer between operation activities and mapped wetland communities. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Operations Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Long Term	Minor	High
	Barking Owl <i>Ninox connexa</i> & Masked Owl <i>Nyctalesthes</i> (medium to large-sized forest owls)	Barking Owl is uncommon and Masked Owl is known from five database records. Study area is of low importance to these species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased competition due to increased presence of feral species. Aggressive exclusion by native 'increaser' species. Increased competition for tree hollows by feral species and 'increaser' species.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
Non-EVR Priority Species	Brown Treecreeper <i>Climacteris picumnus</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Aggressive exclusion by native 'increaser' species. Increased competition for tree hollows by feral species and 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Brush-tailed Phascogale <i>Phascogale tapoatafa</i> & Narrow-nosed Planigale <i>Planigale planigale</i> <i>tenirostris</i> (small to medium-sized dasyurids)	Four database records of Brush-tailed Phascogale and 44 database records of Narrow-nosed Planigale. Study area is of low importance to the phascogale and of negligible importance to the planigale.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased competition for tree hollows by feral species and 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular vehicle speed and use, ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Bush Stone-curlew <i>Burhinus grallarius</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Carpenteria Snake <i>Cryptophis boschmai</i>	Twenty-three database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Common Brushtail Possum <i>Trichosurus vulpecula</i> & Common Ringtail Possum <i>Pseudocheirus peregrinus</i>	Common Brushtail Possum is uncommon but widespread, study area is of moderate importance. Common Ringtail Possum is known from five database records, study area is of negligible importance.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased competition for tree hollows for Common Brushtail Possum by feral species and 'increaser' species.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Diamond Firetail <i>Stagonopleura guttata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Aggressive exclusion by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Unlikely	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	High
	Eastern Grass Owl <i>Tyto longimembris</i>	Four database records for the search area. No records for the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Very Unlikely	Long Term	Negligible	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	Medium

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Eastern Pebble-mouse <i>Pseudomys patius</i>	Two database or survey records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Unlikely	Long Term	Minor	Low
	Eastern Water Dragon <i>Physignathus lesueurii</i>	Twenty-nine database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased predation due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Very Unlikely	Long Term	Negligible	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High
	Fringed Lizard <i>Chlamydosaurus kingii</i>	Six database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Very Unlikely	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High
	Grey-crowned Babbler <i>Pomatostomus temporalis</i> & White-browed Babbler <i>P. superciliosus</i>	Grey-crowned Babbler is common and White-browed Babbler is sparse. Study area is of moderate importance to Grey-crowned Babbler and of low importance to White- browed Babbler.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Aggressive exclusion by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Hooded Robin <i>Melanodryas cucullata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Aggressive exclusion by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Koala <i>Phascolarctos cinereus</i>	Uncommon. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Leaden Delma <i>Delma plebeia</i>	20 records for database search area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	Medium
	Eastern Bentwing Bat <i>Miniopterus orianae oceanensis</i>	Six database records. Study area is of low importance to Eastern Bentwing Bat.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Unlikely	Long Term	Minor	None recommended. A 200 m buffer between activities and any known caves, tunnels and mines should be implemented for Large-eared Pied Bat.	Unlikely	Long Term	Minor	Low
	Macquarie Turtle <i>Emydura macquarii</i> Broad-shelled Turtle <i>Macrochelodina expansa</i>	Less than 10 records of each in database search area. Study area is of low importance for Macquarie Turtle and of moderate importance for Broad- shelled Turtle.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off. Increased predation (including eggs) due to increased presence of feral species.	Possible	Long Term	Moderate	Implement Stormwater and Wastewater Management Plan. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Northern Brown Bandicoot <i>Isodon macrourus</i> Long-nosed Bandicoot <i>Perameles nasuta</i>	Six database records of Northern Brown Bandicoot, study area is of low importance. Three database records of Long-nosed Bandicoot, not recorded from study area, study area is of negligible importance.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High

APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Pale-headed Snake <i>Hoplocephalus bitorquatus</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased competition for tree hollows by feral species and 'increaser' species.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Pink-tongued Lizard <i>Cyclodomorphus gerrardi</i>	Five database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Increased competition for tree hollows by feral species and 'increaser' species.	Very Unlikely	Long Term	Negligible	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Very Unlikely	Long Term	Negligible	High
	Platypus <i>Ornithorhynchus anatinus</i>	Two database records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Long Term	Minor	Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Long Term	Negligible	High
	Rufous Bettong <i>Asiorynchus rufescens</i> & Black- striped Wallaby <i>Macropus dorsalis</i> (small to medium-sized macropods)	Uncommon. Study area of moderate importance to both species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Degradation of habitat by weed invasion from disturbed areas.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Salmon striped Frog <i>Limnodynastes salmini</i>	Common in suitable habitat. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance from noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased predation/competition due to increased presence of feral species.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use and feral animal management guidelines, through the Operations Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Probable	Long Term	Minor	High

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Shingle-back <i>Tiliqua rugosa</i>	Forty-six database and survey records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire, increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Speckled Warbler <i>Chthonicola sagittata</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance from noise pollution. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire, increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Aggressive exclusion by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Spotted Black Snake <i>Pseudochis guttatus</i>	Fifty-eight database records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire, increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Mortality due to attempted predation of Cane Toads in disturbed areas and around waterbodies created for operation.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	Unspotted Yellow-sided Ctenotus <i>Ctenotus ingrami</i>	Thirty-nine database and survey records. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Edge effects from adjacent disturbed areas. Increased likelihood of fire, increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Degradation of habitat by weed invasion from disturbed areas.	Possible	Long Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	Medium



APPENDIX N

TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Yellow-bellied Glider (southern subspecies) <i>Petaurus australis</i> Glider <i>Petaurus norfolcensis</i> & Greater Glider <i>Petauroides volans</i>	Uncommon. Study area is of moderate importance to these species.	Direct: Disturbance from noise pollution. Indirect: Disturbance from light pollution. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation due to increased presence of feral species. Increased competition for tree hollows by feral species and 'increaser' species.	Possible	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
			Direct: Mortality by vehicle collision. Indirect: Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased predation/competition due to increased presence of feral species. Increased predation by native 'increaser' species. Mortality due to attempted predation of Cane Toads in disturbed areas and around waterbodies created for operation.	Probable	Long Term	Significant	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular vehicle speed and use , ecological fire, weed and feral animal management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
<b>State Corridors</b> Southern Brigalow Belt Biodiversity Planning Assessment		State corridors within the study area are of very high importance for fauna movement.	Some species able to still use the corridor subsequent to clearing may find the operation activities too disturbing to cross gaps.  Predation of native fauna by increased presence of feral predators.  Increased presence of native 'increaser species' leading to increased predation or disturbance to native fauna.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular rehabilitation and revegetation management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Medium Term	Minor (habitat offsets will mitigate impact over time)	High
			Some species able to still use the corridor subsequent to clearing may find the operation activities too disturbing to cross gaps.  Predation of native fauna by increased presence of feral predators.  Increased presence of native 'increaser species' leading to increased predation or disturbance to native fauna.	Probable	Long Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) in particular rehabilitation and revegetation management guidelines, through the Operations Environmental Management Plan for the Project.	Probable	Medium Term	Minor (habitat offsets will mitigate impact over time)	High
<b>Feral Species of State Significance</b> Declared Class 2 Pest under the LP Act	Red Fox <i>Vulpes vulpes</i>	Common and widespread.	Increased predation of fauna.	Probable	Long Term	Significant	Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
			Increased predation of fauna.	Probable	Long Term	Significant	Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High
	(feral) Cat <i>Felis catus</i>	Common and widespread.	Increased predation of fauna.	Probable	Long Term	Significant	Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Operations Environmental Management Plan for the Project.	Probable	Long Term	Minor	High

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Feral Species of State Significance Declared Class 2 Pest under the LP Act (cont.)	Rabbit <i>Oryctolagus cuniculus</i>	Occasional and localised.	Possible increase in cleared areas if suitable conditions created. Competition with native fauna. Destruction of habitat for native fauna.	Possible	Long Term	Moderate	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	(feral) Pig <i>Sus scrofa</i>	Common. Widespread in western study area and localised elsewhere.	Possible increase in numbers around waterbodies created as part of construction. Increased degradation of natural waterbodies. Predation of small vetebrates, especially frogs.	Possible	Long Term	Significant	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	(feral) Goat <i>Capra hircus</i>	Generally absent. Some scattered records.	No impact.				Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.				High
	Cane Toad <i>Rhinella marina</i>	Occasional and widespread in the north of the study area. Occasional and localised in the central and eastern study area and absent in the south.	Increased predation/competition with native frog species in disturbed areas and around waterbodies created as part of construction. Increased mortality of native frog-eating species through attempted predation.	Possible	Long Term	Significant	Ensure no potential waterbodies are created that are suitable for breeding. Implement vehicle checks to ensure the species is not accidentally transported. Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Moderate (Indirect offsets - monitoring and research recommended)	High
Other Feral Species Non-native animal	Asian House Gecko <i>Hemidactylus frenatus</i>	Known from Chinchilla. Possibly present in other towns in the area.	Colonization of infrastructure. Competition with native species.	Possible	Long Term	Minor	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Rock Dove <i>Columba livia</i>	Largely restricted to settlements.	No impact.				Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.				High
	Spotted Turtle-Dove <i>Streptopelia chinensis</i>	Largely restricted to settlements.	No impact.				None recommended.				High
	Common Starling <i>Sturnus vulgaris</i>	Common around settlements. Sparse or patchy elsewhere in the study area.	Competition for tree hollows with native species.	Possible	Long Term	Moderate	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Common Myna <i>Sturnus tristis</i>	Occasional and localised in central and eastern study area. Mostly on roads and in settlements.	Displacement of native species from nest hollows. Aggressive behaviour disrupting foraging of native species.	Possible	Long Term	Moderate	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High

APPENDIX N  
TABLE N.7 FAUNA IMPACT - OPERATIONS

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Feral Species Non-native animal (cont.)	House Sparrow <i>Passer domesticus</i>	Common in settlements.	No impact.				Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.				High
	Nutmeg Mannikin <i>Lonchura punctulata</i>	Three records. Very sparse and very localised.	No impact.				None recommended.				High
	House Mouse <i>Mus musculus</i>	Common to very common throughout study area.	Accidental transportation by vehicles. Increase in numbers in disturbed areas	Possible	Long Term	Moderate	Implement vehicle checks to ensure the species is not accidentally transported.  Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Black Rat <i>Rattus rattus</i>	Sparse.	Increase in numbers in disturbed areas. Competition with native species. Nest predation of native species.	Possible	Long Term	Significant	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Minor	High
	Brown Hare <i>Lepus capensis</i>	Sparse.	Increase in numbers in disturbed areas. Competition with native species.	Possible	Long Term	Negligible	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Negligible	High
	(feral) Horse <i>Equus caballus</i>	Common and localised in north of study area.	No impact.	Possible	Long Term	Negligible	Implement feral animal management guidelines (Section 3.5.4) through the Operations Environmental Management Plan for the Project.	Possible	Long Term	Negligible	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Fauna</b> EPBC Act Critically Endangered	Brigalow Woodland Snail Camaenidae BL13 (under submission to DEWHA for listing under the EPBC Act)	Five survey records. Study area is of very high importance to the species.	<u>Direct:</u> Permanent loss of limited available habitat <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas.	Possible	Short Term	Significant	Maintain 200 m buffer between decommissioning activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular weed and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	Medium
	<b>Nationally Significant Fauna</b> EPBC Act Endangered	All known records are from within the study area. Study area is of very high importance to the species.	<u>Direct:</u> Permanent loss of limited available habitat <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas.	Possible	Short Term	Catastrophic	Maintain 200 m buffer between decommissioning activities and mapped habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular weed and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	Low
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Swift Parrot <i>Lathamus discolor</i> (also listed as Endangered under the NC Act)	Very occasional visitor, less than 10 known records. Study area of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Dust coating food resources.	Very Unlikely	Short Term	Negligible	Mitigation and compensatory measures will be applied to relevant suitable habitat in regards to other conservation significant species. Implement dust control measures.	Very Unlikely	Short Term	Negligible	High
	Adorned (Collared) Delma <i>Delma torquata</i> (also listed as Vulnerable under the NC Act)	One record. Study area of low importance to the species.	<u>Direct:</u> Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas. Predation by predators when fleeing disturbance.	Very Unlikely	Short Term	Negligible	Maintain 200 m buffer between decommissioning activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Australian Painted Snipe <i>Rostratula australis</i> (also listed as Vulnerable under the NC Act and as Migratory under the EPBC Act as Painted Snipe R <i>benghalensis s. lat.</i> )	Probably annual though scarce visitor. Study area of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Degradation of fringing vegetation by weed invasion from disturbed areas.	Possible	Short Term	Minor	Maintain 200 m buffer between decommissioning activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular weed and rehabilitation and revegetation management guidelines, through the Decommissioning Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	Medium
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Black-breasted Buffon-quail <i>Turnix melanogaster</i> (also listed as Vulnerable under the NC Act)	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas.	Unlikely	Short Term	Minor	Avoidance of potential habitat (Semi-Evergreen Vine Thicket). No further mitigation actions necessary.	Very Unlikely	Short Term	Negligible	High

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont).	Brigalow Scaly-foot <i>Paradelmia orientalis</i> (also listed as Vulnerable under the NC Act)	Nineteen database and survey records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire, possible mortality and loss of acacia food trees. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas. Predation by predators when fleeing disturbance.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	High
	Dummal's Snake <i>Furina dunmali</i> (also listed as Vulnerable under the NC Act)	Six database records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Degradation of habitat by weed invasion from disturbed areas. Predation by predators when fleeing disturbance.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	Low
	Grey-headed Flying- fox <i>Pteropus</i> <i>poliocephalus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
	Large-eared Pled Bat <i>Chalinolobus dwyeri</i> (also listed as Vulnerable under the NC Act)	One database record. Study area is of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	Maintain a 200 m buffer between decommissioning activities and any known caves, tunnels and mines. No further mitigation actions necessary.	Very Unlikely	Short Term	Negligible	Low
	Plains-wanderer <i>Pedionomus</i> <i>torquatus</i> (also listed as Vulnerable under the NC Act)	Four database records of uncertain location. Vagrant/very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance light pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	Medium

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont).	Red Goshawk <i>Erythrorhynchus radiatus</i>	Two database records, both pre- 1980. Very occasional visitor. Study area of negligible importance to the species.	<b>Direct:</b> Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Disturbance of prey species by noise pollution and decommissioning activities.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	Medium
	South-eastern Long- eared Bat <i>Nyctophilus</i> species formerly <i>N. timorensis</i> (listed as <i>Nyctophilus timorensis</i> ) (also listed as Vulnerable under the NC Act)	Eight database records. Study area is of low importance to the species.	<b>Direct:</b> Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Increased likelihood of fire which could reduce the shrub layer. Increased fuel load due to invasion of wooded areas by Buffel Grass. Predation by predators when fleeing disturbance (by day).	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines; through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Low
	Squatter Pigeon (southern subspecies) <i>Geopelia scripta</i> (also listed as Vulnerable under the NC Act)	Less than 10 database and survey records for study area. Study area is of low importance to the species.	<b>Direct:</b> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Negligible	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation management guidelines, through the Decommissioning Environmental Management Plan for the Project. Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Yakka Shink <i>Egernia rugosa</i> (also listed as Vulnerable under the NC Act)	Four database records. Study area of high importance to the species.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <b>Indirect:</b> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain a 200 m buffer between decommissioning activities and any known colonies. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project. Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.	Unlikely	Short Term	Negligible	Medium
<b>State Significant Fauna</b> NC Act Endangered	Bullock Jewell <i>Hypocnysops piceata</i>	No database records. Study area of low importance to the species.	<b>Direct:</b> nil. <b>Indirect:</b> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between decommissioning activities and any large and mature Buloke woodland. or Implementation of relevant components of the Habitat Management Plan (Section 3.5). Implement Rehabilitation and Revegetation Management Plan (Section 3.5.5). Implement Ecological Fire Management Plan (Section 3.5.6).	Very Unlikely	Short Term	Negligible	Medium

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Vulnerable (cont).	Grey Snake <i>Hemiaspis damelli</i>	Fourteen database records. Study area of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Mortality of prey species, especially frogs. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Maintain a 200 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, through the Decommissioning Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter. Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	Medium
<b>State Significant Fauna</b> NC Act Vulnerable	Glossy Black-Cockatoo <i>Calyptrorhynchus lathami</i>	Uncommon. Study area is of high importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire which could reduce food resources and/or stop recruitment of food trees. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between decommissioning activities and known foraging area. or Implementation of relevant components of the Habitat Management Plan (Section 3.5).  Implement Ecological Fire Management Plan (Section 3.5.6).  Implement Rehabilitation and Revegetation Management Plan (Section 3.5.5).  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
	Pale Imperial Hairstreak <i>Jalmenus eubulus</i>	Seven database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Maintain a 200 m buffer between decommissioning activities and any Brigalow remnant. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	Medium
	Major Mitchell Cockatoo <i>Lophochroa leadbeateri</i>	Three records. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
<b>State Significant Fauna</b> NC Act Rare or Near Threatened	Black-chinned Honeyeater <i>Meliphreptus gularis</i>	Less than 10 database records. Very occasional visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High



APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	Scarce visitor. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Reduction in forage quality by dust. Increased likelihood of weed invasion.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Common Death Adder <i>Acanthophis antarcticus</i>	Ten database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of decommissioning (e.g. trenches after rain). Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Negligible	High
	Cotton Pygmy-goose <i>Nettion coromandelianus</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Golden-tailed Gecko <i>Strophurus taenicauda</i>	Common and widespread in study area. Endemic to bioregion. Study area is very important to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)											
	Freckled Duck <i>Stictonetta naevosa</i>	One database record of uncertain location which may be from the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between construction activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Grey Falcon <i>Falco hypoleucos</i>	Very occasional visitor, less than 10 known records. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting by light pollution. Disturbance to roosting/foraging by noise pollution. <u>Indirect:</u> nil	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
	Grey Goshawk <i>Accipiter novaehollandiae</i>	Three records from study area. Very occasional visitor. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between decommissioning activities and Semi-Evergreen Vine Thicket. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Lewin's Rail <i>Lewinia pectoralis</i>	Very occasional visitor, less than five known records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular rehabilitation and revegetation management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	Low
	Little Pied Bat <i>Chalinolobus picatus</i>	Twenty-three database and survey records. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	None recommended. Would be included under the mitigation measures for Large-eared Pied Bat of the maintenance of a 200 m buffer between construction activities and any known caves, tunnels and mines.	Possible	Short Term	Minor	Medium

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Painted Honeyeater <i>Grantiella picta</i>	Uncommon visitor. Study area is of high importance to the species.	<u>Direct:</u> Disturbance to by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Reduction in food (fruit) quality by dust.	Possible	Short Term	Moderate	Maintain a 100 m buffer between decommissioning activities and areas of Brigalow infested with mistletoe. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed and rehabilitation and revegetation management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Dust Suppression Procedures.	Possible	Short Term	Minor	High
	Rough Frog <i>Cyclorana verrucosa</i>	Generally sparse, may be common in suitable habitat. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance to breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Competition with Cane Toads in disturbed areas and around waterbodies created as part of decommissioning (e.g. trenches after rain).	Possible	Short Term	Moderate	Maintain a 100 m buffer between decommissioning activities and mapped wetland community and/or gullies. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implement Stormwater and Wastewater Management Plan.	Possible	Short Term	Minor	High
	Square-tailed Kite <i>Lophoictinia isura</i>	Uncommon breeding resident. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Turquoise Parrot <i>Neophema pulchella</i>	Sparse. Study area is of low importance to the species.	<u>Direct:</u> Disturbance to roosting/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Woma <i>Aspidites ramsayi</i>	Twenty database records. Known only from western section of study area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. <u>Indirect:</u> Mortality by vehicle collision. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
<b>Nationally Significant Fauna</b> EPBC Act Migratory Terrestrial species	White-throated Needletail <i>Hirundapus caudacutus</i> & Fork-tailed Swift <i>Apus pacificus</i> (aerial species)	Non-breeding summer visitors. Study area is of low importance to both species.	<u>Direct:</u> nil <u>Indirect:</u> Disturbance to aerial foraging by dust.	Very Unlikely	Short Term	Negligible	Implement Dust Suppression Procedures.	Very Unlikely	Short Term	Negligible	High
	Eastern Osprey <i>Pandion cristatus</i> (listed as Osprey <i>P. haliaetus</i> ) & White-bellied Sea-Eagle <i>Haliaeetus</i> <i>leucogaster</i> (raptors associated with waterbodies)	Eastern Osprey is a vagrant. White-bellied Sea-Eagle is uncommon. Study area is of negligible importance to Eastern Osprey and of low importance to White-bellied Sea-Eagle.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High
	Rainbow Bee-eater <i>Merops ornatus</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	None recommended.	Possible	Short Term	Minor	High
	Rufous Fantail <i>Rhipidura rufifrons</i> , Satin Flycatcher <i>Myiagra cyanoleuca</i> & Black-faced Monarch <i>Monarcha melanopsis</i>	Total of 18 database records for the three species. Study area is of low importance to these species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> nil	Unlikely	Short Term	Negligible	None Recommended.	Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
<b>Nationally Significant Fauna</b> EPBC Act Migratory Wetland species	Eastern Great Egret <i>Ardea modesta</i>	Common and widespread. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Possible	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular rehabilitation and revegetation management guidelines; through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High
	Cattle Egret <i>Ardea ibis</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by noise pollution. <u>Indirect:</u> nil	Possible	Short Term	Minor	None recommended.	Possible	Short Term	Minor	High
	Glossy Ibis <i>Plegadis falcinellus</i>	Uncommon in study area. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines (Section 3.5) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
	Pacific Golden Plover <i>Pluvialis fulva</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High
	Latham's Snipe Gallinago hardwickii	Probably annual though scarce visitor. Study area of low importance to the species.	<u>Direct:</u> Disturbance from noise pollution. Disturbance from light pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Degradation of fringing vegetation by weed invasion from disturbed areas.	Possible	Short Term	Minor	Maintain 100 m buffer between decommissioning activities and known habitat, or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed and rehabilitation and revegetation management guidelines; through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	Medium
	Black-tailed Godwit <i>Limosa limosa</i> , Bar- tailed Godwit L. <i>lapponica</i> & Whimbrel <i>Numenius phaeopus</i> (large sandpipers)	Four database records in total. Study area is of negligible importance to these three species.	<u>Direct:</u> Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	None recommended.	Very Unlikely	Short Term	Negligible	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Nationally Significant Fauna EPBC Act Migratory Wetland species (cont.)	Common Greenshank <i>Tringa nebularia</i> , Marsh Sandpiper <i>T. stagnatilis</i> , Wood Sandpiper <i>T. glareola</i> , Common Sandpiper <i>Actitis hypoleucos</i> , Red-necked Stint <i>Calidris ruficollis</i> , Sharp-tailed Sandpiper <i>C. acuminata</i> , Curlew Sandpiper <i>C. ferruginea</i> & Ruf <i>Philomachus pugnax</i> (small to medium- sized sandpipers)	Seven, 10 and 17 database records for Common Greenshank, Marsh Sandpiper and Sharp tailed Sandpiper, respectively. Three or less database records for each of the other species. Uncommon or very occasional visitors. Study area is of low importance to these species.	<u>Direct:</u> Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Minor	High
	Caspian Tern <i>Hydroprogne caspia</i>	Two database records. Very scarce visitor to study area. Study area is of negligible importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ) through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Australian Reed- Warbler <i>Acrocephalus australis</i> (listed as Clamorous Reed-Warbler <i>A. stentoreus</i> )	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion leading to replacement of fringing vegetation with unsuitable species.	Unlikely	Short Term	Minor	Maintain a 100 m buffer between decommissioning activities and mapped wetland community. or Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Unlikely	Short Term	Negligible	High
<b>Non-EVR Priority Species</b>	Barking Owl <i>Ninox connivers</i> & Masked Owl <i>Tyto novaeholandiae</i> (medium to large- sized forest owls)	Barking Owl is uncommon and Masked Owl is known from five database records. Study area is of low importance to these species.	<u>Direct:</u> Disturbance to foraging/breeding by light pollution. Disturbance to foraging/roosting/breeding by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Brown Treecreeper <i>Climacteris picumnus</i>	Uncommon. Study area is of low importance to the species.	<b>Direct:</b> Disturbance to roosting by light pollution. Disturbance to foraging by noise pollution. <b>Indirect:</b> Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Brush-tailed Phascogale <i>Phascogale tapoataia</i> & Narrow- nosed Planigale <i>Planigale tenuirostris</i> (small to medium- sized dasyurids)	Four database records of Brush- tailed Phascogale and 44 database records of Narrow- nosed Planigale. Study area is of low importance to the phascogale and of negligible importance to the planigale.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	Medium
	Bush Stone-curlew <i>Burhinus grallarius</i>	Uncommon. Study area is of low importance to the species.	<b>Direct:</b> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <b>Indirect:</b> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Carpenteria Snake <i>Cryptophis boschmai</i>	Twenty-three database records. Study area is of low importance to the species.	<b>Direct:</b> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <b>Indirect:</b> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Medium



TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Common Brush-tail Possum <i>Trichosurus vulpecula</i> & Common Ringtail Possum <i>Pseudocheirus peregrinus</i>	Common Brush-tail Possum is uncommon but widespread. Common Ringtail Possum is known from five database records. Study area of moderate importance to Common Brush-tail Possum and of negligible importance to Common Ringtail Possum.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	High
	Diamond Fire-tail <i>Stagonopleura gutata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Minor	Implement Weed Management Plan (Section 3.5.3).  Implement Rehabilitation and Revegetation Management Plan (Section 3.5.5).  Implement Ecological Fire Management Plan (Section 3.5.6).	Rare	Short Term	Negligible	High
	Eastern Grass Owl <i>Tyto longimembris</i>	Four database records for the search area. No records for the study area. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased likelihood of weed invasion providing unsuitable groundcover.	Very Unlikely	Short Term	Negligible	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Medium
	Eastern Pebble- mouse <i>Pseudomys patritus</i>	Two database or survey records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations, and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	Low

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Eastern Water Dragon <i>Physignathus lesueurii</i>	Twenty-nine database records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion leading to replacement of fringing vegetation with unsuitable species.	Very Unlikely	Short Term	Negligible	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Filled Lizard <i>Chlamydosaurus kingii</i>	Six database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Very Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations, and check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Grey-crowned Babbler <i>Pomatostomus temporalis</i> & White-browed Babbler P. <i>superciliosus</i>	Grey-crowned Babbler is common and White-browed Babbler is sparse. Study area is of moderate importance to Grey-crowned Babbler and of low importance to White- browed Babbler.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Probable	Short Term	Moderate	Implement Weed Management Plan (Section 3.5.3). Implement Rehabilitation and Revegetation Management Plan (Section 3.5.5).  Implement Ecological Fire Management Plan (Section 3.5.6).	Probable	Short Term	Minor	High
	Hooded Robin <i>Melanodryas cuclata</i>	Uncommon. Study area is of low importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Koala <i>Phascolarctos cinereus</i>	Uncommon. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Leaden Delma <i>Delma plebeia</i>	20 records for database search area. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	Medium
	Eastern Bentwing Bat <i>Miniopterus orianae oceanensis</i>	Six database records. Study area is of low importance.	<u>Direct:</u> Disturbance by light pollution. <u>Indirect:</u> Disturbance by noise pollution. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality.	Unlikely	Short Term	Minor	Fauna spotter/catcher to check any materials stored for more than four days that could provide shelter.  Would be included under the mitigation measures for Large-eared Pied Bat of the maintenance of a 200 m buffer between construction activities and any known caves, tunnels and mines.	Unlikely	Short Term	Minor	Low
	Macquarie Turtle <i>Emydura macquarii</i> Broad-shelled Turtle <i>Macrochelodina expansa</i>	Less than 10 records of each in database search area. Study area of low importance for Macquarie Turtle and of moderate importance for Broad-shelled Turtle.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Unlikely	Short Term	Minor	Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Northern Brown Bandicoot/ <i>Isodon macrourus</i> Long-nosed Bandicoot <i>Perameles nasuta</i>	Six database records of Northern Brown Bandicoot, study area of low importance. Three database records of Long-nosed Bandicoot, study area of negligible importance.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Unlikely	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Pale-headed Snake <i>Hoplocephalus bitorquatus</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Pink-tongued Lizard <i>Cyclodornoporus gerrardi</i>	Five database records. Study area is of negligible importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Very Unlikely	Short Term	Negligible	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Very Unlikely	Short Term	Negligible	High
	Platypus <i>Ornithorhynchus anatinus</i>	Two database records. Study area is of negligible importance to the species.	<u>Direct:</u> nil <u>Indirect:</u> Degradation of waterbodies by run-off.	Very Unlikely	Short Term	Negligible	Implement Stormwater and Wastewater Management Plan.	Very Unlikely	Short Term	Negligible	High
	Rufous Bettong <i>Asiaphrynus rufescens</i> & Black- striped Wallaby <i>Macropus dorsalis</i> (small to medium- sized macropods)	Uncommon. Study area of moderate importance to both species.	<u>Direct:</u> Mortality by vehicle collision. Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Salmon striped Frog <i>Limnodynastes salmini</i>	Common in suitable habitat. Study area is of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. Disturbance by noise pollution. <u>Indirect:</u> Degradation of waterbodies by run-off. Increased likelihood of weed invasion leading to replacement of fringing vegetation with unsuitable species. Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of decommissioning (e.g. trenches after rain). Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed and rehabilitation and revegetation management guidelines, through the Decommissioning Environmental Management Plan for the Project.  Implement Stormwater and Wastewater Management Plan.	Possible	Short Term	Minor	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Shingle-back <i>Tiliqua rugosa</i>	Forty-six database and survey records. Study area is of low importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion leading to choked groundcover.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Speckled Warbler <i>Chthonicola sagittata</i>	Common. Study area is of moderate importance to the species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Spotted Black Snake <i>Pseudechis guttatus</i>	Fifty-eight database records. Study area is of high importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. Mortality by vehicle collision. <u>Indirect:</u> Mortality by attempted predation of Cane Toads present in disturbed areas and around waterbodies created as part of construction. Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire and increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Significant	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Unspotted Yellow-sided Ctenotus <i>Ctenotus ingrami</i>	Thirty-nine database and survey records. Study area of moderate importance to the species.	<u>Direct:</u> Mortality by being trapped in trenches and other excavations. <u>Indirect:</u> Provision of shelter resources in open pipes and under stored equipment/building materials resulting in subsequent mortality. Increased likelihood of fire and increased fuel load due to invasion of wooded areas by Buffel Grass. Increased likelihood of weed invasion.	Possible	Short Term	Minor	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.  Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Unlikely	Short Term	Minor	Medium
	Yellow-bellied Glider (southern subspecies) <i>Petaurus australis</i> Glider <i>Petaurus norfolcensis</i> & Greater Glider <i>Petauroides volans</i>	Uncommon. Study area of moderate importance to these species.	<u>Direct:</u> Disturbance by light pollution. Disturbance by noise pollution. <u>Indirect:</u> Increased likelihood of fire. Increased fuel load due to invasion of wooded areas by Buffel Grass.	Possible	Short Term	Moderate	Implementation of relevant components of the Habitat Management Guidelines ( <b>Section 3.5</b> ), in particular weed, rehabilitation and revegetation and ecological fire management guidelines, through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Non-EVR Priority Species (cont.)	Yellow-spotted Monitor <i>Varanus panoptes</i>	Common in suitable habitat. Study area is of moderate importance to the species.	Direct: Mortality by being trapped in trenches and other excavations.	Probable	Short Term	Moderate	Fauna spotter/catcher to monitor trenches and other excavations and to check any materials stored for more than four days that could provide shelter.	Possible	Short Term	Minor	High
			Indirect: Mortality by attempted predation of Cane Toads present in disturbed areas. Provision of shelter resources in open				Implementation of relevant components of the Habitat Management Guidelines (Section 3.5), in particular vehicle speed and use, weed, feral animal, rehabilitation and revegetation and				
State Corridors Southern Brigalow Belt Biodiversity Planning Assessment		State corridors within the study area are of very high importance for fauna movement.	Those species able to still use the corridor subsequent to clearing and infrastructure construction may find the decommissioning activities too disturbing to cross gaps.	Probable	Short Term	Minor	Implement Rehabilitation and Revegetation Management Guidelines (Section 3.5.5) through the Decommissioning Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
			Predation of native fauna as they flee disturbance by increased presence of feral predators. Increased presence of native 'increaser species' leading to increased predation of native fauna as they flee disturbance.								
Regional Corridors Southern Brigalow Belt Biodiversity Planning Assessment		Regional corridors within the study area are of very high importance for fauna movement.	Those species able to still use the corridor subsequent to clearing and infrastructure construction may find the decommissioning activities too disturbing to cross gaps.	Probable	Short Term	Minor	Implement Rehabilitation and Revegetation Management Guidelines (Section 3.5.5) through the Decommissioning Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
			Predation of native fauna as they flee disturbance by increased presence of feral predators. Increased presence of native 'increaser species' leading to increased predation of native fauna as they flee disturbance.								
Feral Species of State Significance Declared Class 2 Pest under the LP Act	Red Fox <i>Vulpes vulpes</i>	Common and widespread.	Increased predation of fauna displaced by decommissioning activities.	Probable	Short Term	Significant	Implement feral animal management guidelines (Section 3.5.4) through the Decommissioning Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
			Increased predation of fauna displaced by decommissioning activities.								
	Dingo/dog <i>Canis lupus dingo/familiaris</i>	Common and widespread.	Increased predation of fauna displaced by decommissioning activities.	Probable	Short Term	Significant	Implement feral animal management guidelines (Section 3.5.4) through the Decommissioning Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
			Increased predation of fauna displaced by decommissioning activities.								
	(feral) Cat <i>Felis catus</i>	Common and widespread.	Increased predation of fauna displaced by decommissioning activities.	Probable	Short Term	Significant	Implement feral animal management guidelines (Section 3.5.4) through the Decommissioning Environmental Management Plan for the Project.	Probable	Short Term	Minor	High
	Rabbit <i>Oryctolagus cuniculus</i>	Occasional and localised.	No impact.				Implement feral animal management guidelines (Section 3.5.4) through the Decommissioning Environmental Management Plan for the Project.				High

APPENDIX N

TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Feral Species of State Significance Declared Class 2 Pest under the LP Act (cont.)	(feral) Pig <i>Sus scrofa</i>	Common. Widespread in western study area and localised elsewhere.	Increased predation of fauna displaced by decommissioning activities.	Possible	Short Term	Significant	Implement Feral Animal Management Plan ( <b>Section 3.5.4</b> ).	Possible	Short Term	Moderate	High
	(feral) Goat <i>Capra hircus</i>	Generally absent. Some scattered records.	No impact.				None recommended.				High
Other Feral Species Non-native animal	Cane Toad <i>Rhinella marina</i>	Occasional and widespread in the north of the study area. Occasional and localised in the central and eastern study area and absent in the south.	Increased predation/competition with native frog species in disturbed areas and around temporary waterbodies created as part of decommissioning.	Possible	Short Term	Significant	Ensure no potential waterbodies are created that are suitable for breeding.  Implement vehicle checks to ensure the species is not accidentally transported.  Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Asian House Gecko <i>Hemidactylus frenatus</i>	Known from Chinchilla. Possibly present in other towns in the area.	No impact.				None recommended.				High
	Rock Dove <i>Columba livia</i>	Largely restricted to settlements.	No impact.				None recommended.				High
	Spotted Turtle-Dove <i>Streptopelia chinensis</i>	Largely restricted to settlements.	No impact.				None recommended.				High
	Common Starling <i>Sturnus vulgaris</i>	Common around settlements. Sparse or patchy elsewhere in the study area.	Colonization of tree hollows vacated by disturbed native fauna.	Possible	Short Term	Moderate	Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Common Myna <i>Sturnus trisus</i>	Occasional and localised in central and eastern study area. Mostly on roads and in settlements.	Colonization of tree hollows vacated by disturbed native fauna.	Possible	Short Term	Moderate	Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	House Sparrow <i>Passer domesticus</i>	Common in settlements.	No impact.				None recommended.				High
	Nutmeg Mannikin <i>Lonicura punctulata</i>	Three records. Very sparse and very localised.	No impact.				None recommended.				High



APPENDIX N  
TABLE N.8 FAUNA IMPACT - DECOMMISSIONING

Element and Status/ Qualification	Species	Significance of study area	Impact Type	Unmitigated Impact			Mitigation Recommendations	Mitigated Impact			Prediction Reliability Index
				Likelihood of Impact Occurring	Preliminary Impact Duration	Preliminary Impact Assessment		Likelihood of Impact Occurring	Residual Impact Duration	Residual Impact Assessment	
Other Feral Species Non-native animal (cont.)	House Mouse <i>Mus musculus</i>	Common to very common throughout study area.	Accidental transportation by vehicles.	Possible	Short Term	Minor	Implement vehicle checks to ensure the species is not accidentally transported.  Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Decommissioning Environmental Management Plan for the Project.	Possible	Short Term	Minor	High
	Black Rat <i>Rattus rattus</i>	Sparse.	No impact.				Implement feral animal management guidelines ( <b>Section 3.5.4</b> ) through the Decommissioning Environmental Management Plan for the Project.				High
	Brown Hare <i>Lepus capensis</i>	Sparse.	No impact.				None recommended.				High
	(feral) Horse <i>Equus caballus</i>	Common and localised in north of study area.	No impact.				None recommended.				High

**Appendix O:**  
**Terrestrial Ecology Offset Tables**

Biodiversity Value Impacted	Potential Area Affected for each Value <sup>1</sup>	Environmental Outcome Sought	Potential Offset Descriptions			Offset Trigger	Offset timing
			Values	Location (in order of preference)	Offset type and characteristics		
Regional Ecosystems:							
EPBC Endangered Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains - RE 11.3.1 Also listed as Endangered under the VM Act.  Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrowleaved Box ( <i>E. pilligaensis</i> ), Brigalow ( <i>Acacia harpophylla</i> ), Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains - RE 11.4.10. Also listed as Endangered under the VM Act.  Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains - RE 11.4.3. Also listed as Endangered under the VM Act  Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains - RE 11.4.7. Also listed as Endangered under the VM Act.  Semi-evergreen vine thicket on fine grained sedimentary rocks - RE 11.9.4. Also listed as Of Concern under the VM Act.  Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine-grained sedimentary rocks - RE 11.9.5. Also listed as Endangered under the VM Act	Improve extent of Endangered Ecological Communities	Same RE.	Within bioregional corridors within tenements.  Outside of bioregional corridors within tenements.	Direct offset.	Offset ratios to be developed in consultation with DNRW and DEWHA..	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.  Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.
State Significant Regional Ecosystems Of Concern REs (those that are not also EPBC listed)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains - RE 11.4.12.  Black Tea-tree ( <i>Melaleuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities - RE 11.4.3a	Improve extent of Endangered REs	Same RE.	Within bioregional corridors within tenements.  Outside of bioregional corridors within tenements.	Direct offset.	Offset ratios to be developed in consultation with DNRW.	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.  Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.
State Significant Regional Ecosystems Of Concern REs (those that are not also EPBC listed)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains - RE 11.3.2  Poplar Box ( <i>Eucalyptus populnea</i> ) woodland with Brigalow ( <i>Acacia harpophylla</i> )	Long-term protection of existing REs – most likely through arrangements on private land; Restoration or	Same RE.	Within bioregional corridors within tenements.  Outside of bioregional corridors within tenements.	Direct offset.	Offset ratios to be developed in consultation with DNRW.	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.

APPENDIX O  
TABLE O.1 OFFSET RECOMMENDATIONS

Biodiversity Value Impacted	Potential Area Affected for each Value <sup>1</sup>	Environmental Outcome Sought	Potential Offset Descriptions			Offset Trigger	Offset timing
			Values	Location (in order of preference)	Ratio of impact to offset		
	and /or Belah ( <i>Casuarina cristata</i> ) on alluvial plains - RE 11.3.17 (also listed as Endangered Biodiversity Status under the VM Act)  Coolbah ( <i>Eucalyptus coolabah</i> ) woodland on alluvial plains - RE 11.3.3  Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and/ or Eucalyptus spp. tall woodland on alluvial plains - RE 11.3.4  Poplar Box ( <i>Eucalyptus populnea</i> ), False sandalwood ( <i>Eremophila mitchellii</i> ) shrubby woodland on fine-grained sedimentary rocks - RE 11.9.7  Brigalow ( <i>Acacia harpophylla</i> ) and Poplar Box ( <i>Eucalyptus populnea</i> ) open forest on fine-grained sedimentary rocks - RE 11.9.10	rehabilitation of existing degraded REs; or  Re-establishing REs.					Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.
<b>Species:</b>							
EPBC Listed Species for which the Project Area provides important habitat and for which residual impacts are "Moderate" or higher **Endangered or *Vulnerable under the NC Act)	5568 ha potential habitat for Brigalow Scaly-foot* 3614 ha potential habitat for Dunnall's Snake 5272 ha potential habitat for Yakka Skink	Long-term protection of existing habitat – most likely through arrangements on private land;  Restoration or rehabilitation of existing degraded habitat; or  Re-establishing habitat.	Environmental offsets commensurate with the magnitude of the impacts of the development and deliver outcomes that are 'like for like'.	1. within the meta-population 2. within the sub-region 3. In an adjacent sub-region in the same bioregion where it is demonstrated that the environmental outcome will be met.	Offset ratios to be developed in consultation with DNRW and DEWHA..	Clearing within REs: 11.3.1, 11.3.2, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.19, 11.3.25, 11.3.27b, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.1a, 11.5.4, 11.5.4a, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.4c, 11.7.5, 11.7.6, 11.7.7, 11.9.1, 11.9.4a, 11.9.4b, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.10.1, 11.10.1d, 11.10.9, 11.10.11	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.  Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.
NC Act Endangered Species for which the Project Area provides important habitat and for which residual impacts are "Moderate" or higher (may also be listed under EPBC Act*)	674 ha potential habitat for Grey Snake	Long-term protection of existing habitat – most likely through arrangements on private land;  Restoration or rehabilitation of existing degraded habitat; or  Re-establishing habitat.	Environmental offsets commensurate with the magnitude of the impacts of the development and deliver outcomes that are 'like for like'.	1. within the meta-population 2. within the sub-region 3. in an adjacent sub-region in the same bioregion where it is demonstrated that the environmental outcome will be met.	Offset ratios to be developed in consultation with DNRW and DEWHA..	Clearing within REs: 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.25, 11.3.26, 11.3.27b, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.9.11, 11.9.5	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.  Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.
NC Act Vulnerable Species for which the Project Area provides important habitat (may also be listed under EPBC Act*)	5568 ha potential habitat for Brigalow Scaly-foot* 3614 ha potential habitat for Dunnall's Snake 5272 ha potential habitat for	Improve population viability of the relevant species in the wild.	Same RE or REs that constitute habitat with similar carrying capacity for the species.	1. within the meta-population 2. within the sub-region 3. in an adjacent sub-region in the same bioregion where it is	Offset ratios to be developed in consultation with DNRW and DEWHA..	Clearing within REs: 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.19, 11.3.25, 11.3.27b, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.1a,	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs.  Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.

APPENDIX O  
TABLE O.1 OFFSET RECOMMENDATIONS

Biodiversity Value Impacted	Potential Area Affected for each Value <sup>1</sup>	Environmental Outcome Sought	Potential Offset Descriptions			Offset Trigger	Offset timing
			Values	Location (in order of preference)	Offset type and characteristics	Ratio of impact to offset	
	Yakka Skink 2728 ha potential habitat for Glossy Black-Cockatoo			demonstrated that the environmental outcome will be met.		11.5.4, 11.5.4a, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.4c, 11.7.5, 11.7.6, 11.7.7, 11.8.3, 11.9.1, 11.9.4a, 11.9.4b, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.10.1, 11.10.1d, 11.10.9, 11.10.11	offsets on maintenance twelve (12) months prior to clearing within listed REs.
NC Act Rare or near-threatened species for which the Project Area provides important habitat	5432 ha potential habitat for Golden-tailed Gecko 5828 ha potential habitat for Little Pied Bat 5244 ha potential habitat for Square-tailed Kite 458 ha potential habitat for Rough Frog 5409 ha potential habitat for Woma	Improve population viability of the relevant species in the wild.	Same RE or REs that constitute habitat with similar carrying capacity for the species.	1. within the meta-population 2. within the sub-region 3. in an adjacent sub-region in the same bioregion where it is demonstrated that the environmental outcome will be met.	Direct offsets preferred, but may be supplemented with indirect offsets.	Clearing within REs: 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.19, 11.3.25, 11.3.26, 11.3.27b, 11.3.39, 11.4.3, 11.4.3a, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.1a, 11.5.4, 11.5.4a, 11.5.5, 11.5.20, 11.5.21, 11.7.1, 11.7.2, 11.7.4, 11.7.4c, 11.7.5, 11.7.6, 11.7.7, 11.8.3, 11.9.1, 11.9.4a, 11.9.4b, 11.9.5, 11.9.6, 11.9.7, 11.9.9, 11.9.10, 11.10.1, 11.10.1d, 11.10.9, 11.10.11	Regrowth-based offsets on maintenance three (3) months prior to clearing within listed REs. Replanting-based offsets on maintenance twelve (12) months prior to clearing within listed REs.

<sup>1</sup> As many of the offset ratios are common to a number of values, the total vegetation communities (REs) and habitat requiring offset are provided in **Table 3.6**.

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
<b>Nationally Significant</b> Critically Endangered Ecological Communities	White Box - Yellow Box - Blakey's Red Gum Grassy Woodlands and derived native grasslands - REs 11.8.2a, 11.8.8, 11.9.9 & 11.3.23	n/a (microwave tower site outside of Project Area)	Potentially 70m x 70m area and access track proposed for microwave tower siting	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Thorough ecological survey required prior to infrastructure siting to verify RE mapping. Investigation of alternatives to avoid impact if community present.	n/a	None recommended
<b>Nationally Significant</b> Endangered Ecological Communities	Brigalow ( <i>Acacia harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) open forest on alluvial plains RE 11.3.1 Also listed as Endangered under the VM Act	792 ha	4.5 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.1 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Weeping Myall - rare and patchy occurrence within RE 11.3.2	14038 ha	128.6 ha within RE 11.3.2, although nil within locations currently known to support Weeping Myall	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Prior to any works within RE 11.3.2 undertake search for Weeping Myall communities avoid disturbance where communities are located and prepare management plan for any proposed works within a 200m buffer. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	n/a	Research exotic grass control techniques.
	Poplar Box ( <i>Eucalyptus populnea</i> ) or Narrow-leaved Box ( <i>E. pilligensis</i> ) , Brigalow ( <i>Acacia harpophylla</i> ) , Belah ( <i>Casuarina cristata</i> ) open forest to woodland on margins of Cainozoic clay plains RE 11.4.10 Also listed as Endangered under the VM Act	64 ha	0.9 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.4.10 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) shrubby open forest on Cainozoic clay plains RE 11.4.3 Also listed as Endangered under the VM Act	4759 ha	18.86 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.4.3 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Open forest to woodland of Poplar Box ( <i>Eucalyptus populnea</i> ) with Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) on Cainozoic clay plains RE 11.4.7 Also listed as Endangered under the VM Act	292 ha	0.43 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.4.7 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.

APPENDIX O  
TABLE O.2 FLORA OFFSETS

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Endangered Ecological Communities (cont.)							
	Semi-evergreen vine thickets (SEVT) on Cainozoic igneous rocks on steep hillsides RE 11.8.3	8 ha	Nil	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.8.3 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Brigalow ( <i>Acacia harpophylla</i> ) - Dawson Gum ( <i>Eucalyptus cambageana</i> ) open forest to woodland on fine-grained sedimentary rocks RE 11.9.1 Also listed as Endangered under the VM Act	7 ha	Nil	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.9.1 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Semi-evergreen vine thicket on fine grained sedimentary rocks RE 11.9.4 Also listed as Of Concern under the VM Act	12 ha	Nil	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.4 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Brigalow ( <i>Acacia harpophylla</i> ) and / or Belah ( <i>Casuarina cristata</i> ) open forest on fine- grained sedimentary rocks RE 11.9.5 Also listed as Endangered under the VM Act	10264 ha	44.8 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.9.5 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
	Myall ( <i>Acacia melvillei</i> ) ± Brigalow ( <i>Acacia harpophylla</i> ) open forest on fine-grained sedimentary rocks RE 11.9.6 Also listed as Endangered under the VM Act	118 ha	Nil	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.9.6 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.



Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Endangered Ecological Communities (cont.)	Poplar Box ( <i>Eucalyptus populnea</i> ), False Sandalwood ( <i>Eremophila mitchellii</i> ), shrubby woodland on fine- grained sedimentary rocks RE 11.9.7 Also listed as Of Concern under the VM Act	2375 ha	2.9 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.9.7 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.
<b>State Significant Regional Ecosystems</b> Endangered REs (those not listed under EPBC)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on Cainozoic clay plains RE 11.4.12	1183 ha	12.72 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.4.12 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended
	Black Tea-tree ( <i>Melaleuca bracteata</i> ) woodland fringing swamp associated with Brigalow ( <i>Acacia harpophylla</i> ) communities RE 11.4.3	4759 ha	18.9 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.4.13 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended
<b>State Significant Regional Ecosystems</b> Of Concern REs with Endangered Biodiversity Status (those not listed under EPBC)	Brigalow ( <i>Acacia harpophylla</i> ) and Poplar Box ( <i>Eucalyptus populnea</i> ) open forest on fine- grained sedimentary rocks RE 11.9.10	3140 ha	19.8 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.9.10 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended
	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland on alluvial plains RE 11.3.2	14038 ha	128.6 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.2 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended

APPENDIX O  
TABLE O.2 FLORA OFFSETS

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
State Significant Regional Ecosystems Of Concern REs with Endangered Biodiversity Status (those not listed under EPBC) (cont.)	Poplar Box ( <i>Eucalyptus populnea</i> ) woodland with Brigalow ( <i>Acacia Harpophylla</i> ) and/or Belah ( <i>Casuarina cristata</i> ) on alluvial plains RE 11.3.17	86 ha	1 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.17 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended
State Significant Regional Ecosystems Of Concern REs (those not listed under EPBC)	Coolbah ( <i>Eucalyptus coolabah</i> ) woodland on alluvial plains RE 11.3.3	729 ha	7.8 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.3 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	If avoidance is not possible for all occurrences of this RE, offset like for like as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended
Nationally Significant Flora EBPC Act Endangered	Queensland Blue Gum ( <i>Eucalyptus tereticornis</i> ) and/or <i>Eucalyptus</i> spp. tall woodland on alluvial plains RE 11.3.4	2596 ha	10.2 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Avoid disturbance to RE 11.3.4 where it occurs in Sensitivity Category 1. Disturbance within Sensitivity Category 2 subject to restrictions on clearing outside of already disturbed areas. Minimise disturbance elsewhere. Implement relevant components of the habitat management guidelines (Section 3.5) for works within a 200m buffer of all occurrences through the Environmental Management Plan for the Project.	Offset at a ratio of 1:2 within bioregional corridors or when connecting remnant patches or 1.2.5 outside of bioregional corridors - through protection, enhancement and management of analogous regrowth vegetation; or Offset at a ratio of 1:3 within bioregional corridors or when connecting remnant patches or 1.3.5 outside of bioregional corridors - through replanting currently cleared lands with relevant preclearing RE.	None recommended
Nationally Significant Flora EBPC Act Endangered	Microcarpaea <i>Microcarpaea agonis</i> (also listed as Endangered under the NC Act)	58326 ha potential habitat (REs 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.25, 11.3.27b)	630.22 ha potential habitat RE 11.3.1 - 4.5 ha RE 11.3.2 - 128.60 ha RE 11.3.3 - 7.81 ha RE 11.3.4 - 10.21 ha RE 11.3.14 - 195.67 ha RE 11.3.17 - 0.98 ha RE 11.3.18 - 33.18 ha RE 11.3.25 - 248.86 RE 11.3.27b - 0.4 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses, altered hydrology.	Offset clearing in REs 11.3.1, 11.3.2, 11.3.3, 11.3.4 & 11.3.17. Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the species to be avoided and protected. If disturbance is necessary, application for removal will need to be made to DERM. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs. Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 159 ha). Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
Nationally Significant Flora EBPC Act Endangered	Slender Tyophora <i>Tyophora linearis</i> (also listed as Endangered under the NC Act)	19765 ha potential habitat RE 11.7.5 19765 ha	125.89 ha potential habitat	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses, gravel extraction, infrastructure placement, stockpiling.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Slender Tyophora to be avoided and protected. If disturbance is necessary, application will need to be made to DEWHA. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 42 ha). Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Flora EBPC Act Endangered (cont.)	Herbaceous Xerothamnella <i>Xerothamnella herbacea</i> (also listed as Endangered under the NC Act)	44130 ha potential habitat	181.48 ha potential habitat RE 11.3.1 - 4.5 ha RE 11.3.3 - 7.81 ha RE 11.3.17 - 0.98 ha RE 11.4.3 - 18.86 ha RE 11.4.7 - 0.43 ha RE 11.4.10 - 0.9 ha RE 11.7.6 - 83.42 ha RE 11.9.1 - 0 ha RE 11.9.5 - 44.78 ha RE 11.9.10 - 19.8 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Offset clearing in REs 11.3.1, 11.3.3, 11.3.17, 11.4.3, 11.4.7, 11.4.10, 11.9.1, 11.9.5 & 11.9.10.  Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Herbaceous Xerothamnella to be avoided and protected.  If disturbance is necessary, application will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs.  Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 28 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
Nationally Significant Flora EPBC Act Vulnerable	Chinchilla Wattle <i>Acacia chinchillensis</i> (also listed as Near Threatened under the NC Act)	343633 ha potential habitat (REs 11.3.18, 11.5.1, 11.5.4, 11.5.5, 11.5.21, 11.7.4, 11.7.5, 11.7.6)	3840.12 ha potential habitat RE 11.3.18 - 33.18 ha RE 11.5.1 - 2344.7 ha RE 11.5.4 - 398.35 ha RE 11.5.5 - 213.17 ha RE 11.5.21 - 0.01 ha RE 11.7.4 - 641.41 ha RE 11.7.5 - 125.89 Re 11.7.6 - 83.42 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Project Area of particular significance to this species. Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the species to be avoided and protected.  If disturbance is necessary, application will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1280 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Curly-barked Wattle <i>Acacia curranii</i> (also listed as Vulnerable under the NC Act)	1445 ha potential habitat	37 ha potential habitat 11.3.8 - 33.18 ha 11.7.2 - 176.06 ha 11.7.5 - 125.89 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	The Project Area is of particular significance to this species. Infrastructure planning within any REs within the Gurumundi area known to support the species to be preceded by species- specific searches and those areas supporting Curly-barked Wattle to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 112 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Tara Wattle <i>Acacia lauta</i> (also listed as Vulnerable under the NC Act)	177828 ha potential habitat (REs 11.5.4, 11.7.4, 11.7.5, 11.7.7)	1678.69 ha potential habitat RE 11.5.4 - 398.35 ha RE 11.7.4 - 641.41 ha RE 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Tara Wattle to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 518 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Thomby Range Wattle <i>Acacia wardleii</i> (also listed as Vulnerable under the NC Act)	229121 ha potential habitat (REs 11.5.21, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.9, 11.10.1, 11.10.9, 11.10.11)	2060.71 ha potential habitat RE 11.5.21 - 0.01 ha RE 11.7.2 - 176.06 ha RE 11.7.4 - 641.41 ha RE 11.7.5 - 125.89 ha RE 11.7.6 - 83.42 ha RE 11.7.7 - 513.04 ha RE 11.9.9 - 0 ha RE 11.10.1 - 100.88 ha RE 11.10.9 - 294.22 ha 11.10.11 - 125.78 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Thomby Range Wattle to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 687 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Ooline <i>Cadellia pentastylis</i> (also listed as Vulnerable under the NCA)	89331 ha potential habitat (REs 11.4.3, 11.7.1, 11.7.2, 11.7.7, 11.8.3, 11.9.1, 11.9.4ab, 11.9.5, 11.9.10)	798.65 ha potential habitat RE 11.4.3 - 18.86 ha RE 11.7.1 - 13.83 ha RE 11.7.2 - 176.06 ha RE 11.7.7 - 513.04 ha RE 11.8.3 - 0 ha RE 11.9.1 - 0 ha RE 11.9.4ab - 0 ha RE 11.9.5 - 44.78 ha RE 11.9.10 - 19.8 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Offset clearing within REs 11.9.5 & 11.9.10.  Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Ooline to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs.  Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 233 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Gurulumundi Fringe Myrtle <i>Gurulumundensis</i> (also listed as Vulnerable under the NC Act)	1445 ha potential habitat	37 ha potential habitat 11.7.2 - 176.06 ha 11.7.4 - 641.41 ha 11.7.5 - 125.89 ha 11.7.6 - 83.42 ha 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	The Project Area is of particular significance to this species. Infrastructure planning within any REs within the Gurulumundi area known to support the species to be preceded by species- specific searches and those areas supporting Gurulumundi Fringe Myrtle to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA and DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 513 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Pink Donkey-orchid <i>Diuris tricolor</i>	517814 ha potential habitat (REs 11.3.2, 11.3.4, 11.3.14, 11.3.18, 11.3.19, 11.3.25, 11.3.39, 11.5.1, 11.5.4, 11.5.5, 11.5.20, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.9.7, 11.9.10, 11.10.1, 11.10.9, 11.10.11)	5836.54 ha potential habitat	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Offset clearing within REs 11.3.2 & 11.3.4.  Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Pink Donkey-orchid to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs.  Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1891 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended

APPENDIX O  
TABLE O.2 FLORA OFFSETS

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Shiny-leaved Ironbark <i>Eucalyptus virens</i> (also listed as Vulnerable under the NC Act)	177828 ha potential habitat (REs 11.5.4, 11.7.4, 11.7.5, 11.7.7)	1678.69 ha potential habitat RE 11.5.4 - 398.35 ha RE 11.7.4 - 641.41 ha RE 11.7.5 - 125.89 ha RE 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Shiny-leaved Ironbark to be avoided and protected. If disturbance is necessary, application for removal will need to be made to DEWHA. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 560 ha). Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Belson's Panic Grass <i>Homopholis belsonii</i> (also listed as Endangered under the NC Act)	30349 ha potential habitat (REs 11.3.1, 11.3.2, 11.3.17, 11.4.3, 11.4.7, 11.9.5, 11.9.6)	198.15 ha potential habitat RE 11.3.1 - 4.5 ha RE 11.3.2 - 128.60 ha RE 11.3.17 - 0.98 ha RE 11.4.3 - 18.86 ha RE 11.4.7 - 0.43 ha RE 11.9.5 - 44.78 ha RE 11.9.6 - 0 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Offset clearing within REs 11.3.1, 11.3.2, 11.3.17, 11.4.3, 11.4.7, 11.9.5 & 11.9.6. Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Belson's Panic Grass to be avoided and protected. If disturbance is necessary, application for removal will need to be made to DEWHA. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs. Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	a Waxflower <i>Philotheca sporadica</i> (also listed as Vulnerable under the NC Act)	1445 ha potential habitat	37 ha potential habitat 11.3.18 - 33.18 ha 11.4.10 - 0.9 ha 11.5.1 - 2344.7 ha 11.5.4 - 398.35 ha 11.5.21 - 0.1 ha 11.7.2 - 176.06 ha 11.7.4 - 641.41 ha 11.7.5 - 125.89 ha 11.7.6 - 83.42 ha 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses, gravel extraction, infrastructure placement, stockpiling.	The Project Area is of particular significance to this species. Infrastructure planning within any REs within the Gurimundi area known to support the species to be preceded by species- specific searches and those areas supporting Philotheca sporadica to be avoided and protected. If disturbance is necessary, application for removal will need to be made to DEWHA and suitable offsets calculated. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1439 ha). Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Dunmore Mint-bush <i>Prostanthera</i> sp. Dunmore (also listed as Vulnerable under the NC Act)	5082 ha potential habitat (RE 11.10.11)	125.78 ha potential habitat RE 11.10.11 - 125.78 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the Dunmore Mint-bush to be avoided and protected. If disturbance is necessary, application for removal will need to be made to DEWHA. Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 42 ha). Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable. Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended

APPENDIX O  
TABLE O.2 FLORA OFFSETS

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
Nationally Significant Flora EPBC Act Vulnerable (cont.)	Cobar Greenhood Orchid <i>Pterostylis cobarensis</i>	436165 ha potential habitat (REs 11.5.1, 11.5.4, 11.5.5, 11.5.21, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.7.7, 11.10.1, 11.10.9)	4891.15 ha potential habitat RE 11.5.1 - 2344.7 ha RE 11.5.4 - 398.35 ha RE 11.5.5 - 213.17 ha RE 11.5.21 - 0.01 ha RE 11.7.2 - 176.06 ha RE 11.7.4 - 641.41 ha RE 11.7.5 - 125.89 ha Re 11.7.6 - 83.42 ha RE 11.7.7 - 513.04 ha RE 11.10.1 - 100.88ha RE 11.10.9 - 294.22 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Cobar Greenhood Orchid to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DEWHA.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1630 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
<b>State Significant Flora</b> NC Act Endangered (those not listed under EPBC Act)	Gurilmundi Heath-myrtle <i>Micromyrtus carinata</i>	1445 ha potential habitat	37 ha potential habitat 11.5.5 - 213.17 ha 11.7.2 - 176.06 ha 11.7.4 - 641.41 ha 11.7.5 - 125.89 ha 11.7.6 - 83.42 ha 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	The Project Area is of particular significance to this species. Infrastructure planning within any REs within the Gurilmundi area known to support Gurilmundi Heath-myrtle to be preceded by species-specific searches and those areas supporting the species to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 584 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Red-soil Woolly Winklewort <i>Rutidosia lanata</i>	298809 ha potential habitat (REs 11.3.1, 11.3.2, 11.3.18, 11.4.3, 11.4.7, 11.4.10, 11.4.12, 11.5.1, 11.5.5, 11.7.2, 11.7.7, 11.9.5, 11.9.6, 11.9.7, 11.9.10, 11.10.9)	3807.81 ha potential habitat 11.5.5 - 213.17 ha 11.7.2 - 176.06 ha 11.7.4 - 641.41 ha 11.7.5 - 125.89 ha 11.7.6 - 83.42 ha 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Red-soil Woolly Winklewort to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1191 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
<b>State Significant Flora</b> NC Act Vulnerable (those not listed under EPBC Act)	Gonocarpus <i>Gonocarpus urceolatus</i>	165690 ha potential habitat (REs 11.7.2, 11.7.4, 11.7.5, 11.7.7)	1456.40 ha potential habitat RE 11.7.2 - 176.06 ha RE 11.7.4 641.41 ha RE 11.7.5 - 125.89 ha RE 11.7.7 - 513.04 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the species to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 485 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended

APPENDIX O  
TABLE O.2 FLORA OFFSETS

Element and Status/ Qualification	RE/Species	Total hectares mapped within Project Area (based on revised RE mapping)	Approximate hectares proposed for clearing	Identified Threats	Recommended Impact Mitigation Actions	Direct Offset Recommendations	Recommended Indirect Offset
State Significant Flora NC Act Vulnerable (those not listed under EPBC Act) (cont.)	Winged Nightshade <i>Solanum stenopterum</i>	187916 ha potential habitat (REs 11.5.1, 11.5.5, 11.7.1, 11.9.4ab)	2583.97 ha potential habitat RE 11.5.1 - 2344.7 ha RE 11.5.5 - 213.17 ha RE 11.7.1 - 13.83 ha RE 11.9.4ab - 0 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Winged Nightshade to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 857 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
State Significant Flora NC Act Rare	Scrub Wattle <i>Acacia tenuinervis</i>	356086 ha potential habitat (REs 11.5.1, 11.5.4, 11.5.5, 11.7.2, 11.7.4, 11.7.5, 11.7.6, 11.9.4ab)	3995.27 ha potential habitat RE 11.5.1 - 2344.7 ha RE 11.5.4 - 398.35 ha RE 11.5.5 - 213.17 ha RE 11.7.2 - 176.06 ha RE 11.7.4 - 641.41 ha RE 11.7.5 - 125.89 ha RE 11.7.6 - 83.42 ha RE 11.9.4ab - 0 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses.	Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting Scrub Wattle to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 1327 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Blake's Spikerush <i>Eleocharis blakeana</i>	75013 ha potential habitat (REs 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.25, 11.3.27b, 11.4.3, 11.4.7, 11.4.10, 11.4.12, 11.9.1, 11.9.5, 11.9.6)	707.90 ha potential habitat RE 11.3.1 - 4.5 ha RE 11.3.2 - 128.60 ha RE 11.3.3 - 7.81 ha RE 11.3.4 - 10.21 ha RE 11.3.14 - 195.67 ha RE 11.3.17 - 0.98 ha RE 11.3.18 - 33.18 ha RE 11.3.25 - 248.86 ha RE 11.3.27b - 0.4 ha RE 11.4.3 - 18.86 ha RE 11.4.7 - 0.43 ha RE 11.4.10 - 0.9 ha RE 11.4.12 - 12.72 ha RE 11.9.5 - 44.78 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses, altered hydrology.	Offset clearing within REs 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.17, 11.4.3, 11.4.7, 11.4.10, 11.4.12, 11.9.1, 11.9.5 & 11.9.6.  Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the species to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs.  Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 159 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended
	Wandering Fringe-rush <i>Fimbristylis vagans</i>	48105 ha potential habitat (REs 11.3.1, 11.3.2, 11.3.3, 11.3.18, 11.3.25, 11.3.27b, 11.4.3, 11.4.7)	442.63 ha potential habitat RE 11.3.1 - 4.5 ha RE 11.3.2 - 128.60 ha RE 11.3.3 - 7.81 ha RE 11.3.18 - 33.18 ha RE 11.3.25 - 248.86 ha RE 11.3.27b - 0.4 ha RE 11.4.3 - 18.86 ha RE 11.4.7 - 0.43 ha	Clearing, cattle damage, weed infestation, frequent fire, encroachment of exotic grasses, altered hydrology.	Offset clearing within REs 11.3.1, 11.3.2, 11.3.3, 11.4.3 & 11.4.7.  Infrastructure planning within any REs known to support the species to be preceded by species-specific searches and those areas supporting the species to be avoided and protected.  If disturbance is necessary, application for removal will need to be made to DERM.  Implement Environmental Management Plan incorporating clearing management, weed management, rehabilitation and revegetation management and ecological fire management guidelines.	Offset endangered and of concern REs within which the species occurs.  Rehabilitate to cleared vegetation type all areas not required for operational purposes (approximately 94 ha).  Incorporate local provenance propagules of the species in rehabilitation works where conditions are suitable.  Mitigation measures adequate (Tables N.1-N.4). No further offset recommended.	None recommended



APPENDIX O  
TABLE O.3 FAUNA OFFSETS

Element and Status/ Qualification	Species	Total hectares mapped within study area	Total hectares proposed for clearing	Identified Threats	Proposed Impact Mitigation Actions	Potential Direct Offset	Potential Indirect Offset
<b>Nationally Significant Fauna</b> EPBC Act Critically Endangered	Brigalow Woodland Snail <i>Camaenidae</i> BL13 (under submission to DEWHA for listing under the EPBC Act)	816 ha of potential habitat associated with the Condamine River alluvials	18 ha potential habitat	Clearing, grazing, frequent and high-intensity fire.	Survey within 200m buffer of proposed infrastructure and avoid impact on habitat. Implement species-specific management guidelines within 200m buffer under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	Fund preparation of a Recovery Plan for the species.
<b>Nationally Significant Fauna</b> EPBC Act Endangered	Dulacca Woodland Snail <i>Camaenidae</i> BL12 (under submission to DEWHA for listing under the EPBC Act)	7354 ha of potential habitat associated with creek system alluvials	165 ha potential habitat	Clearing, grazing, frequent and high-intensity fire.	Survey within 200m buffer of proposed infrastructure and avoid impact on habitat. Implement species-specific management guidelines within 200m buffer under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	Fund preparation of a Recovery Plan for the species.
<b>Nationally Significant Fauna</b> EPBC Act Vulnerable	Swift Parrot <i>Lathamus discolor</i> (also listed as Endangered under the NC Act)	Very occasional (decadal) non-breeding winter visitor. Marginal in study area and offsets are unnecessary.	n/a	Loss of habitat, degradation leading to dieback of eucalypts, lack of regeneration of food trees.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Adorned Delima <i>Delima torquata</i> (also listed as Vulnerable under the NC Act)	One record. Marginal in study area and offsets are unnecessary.	n/a	Loss of habitat, predation by cats and foxes.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	n/a
	Australian Painted Snipe <i>Rostratula australis</i> (also listed as Vulnerable under the NC Act and as Migratory under the EPBC Act as Painted Snipe <i>R. benghalensis s. lat</i> )	54056 ha potential habitat mapped within the study area.	449.7 ha potential habitat	Drainage of wetlands, diversion of water from river systems, clearance of wetland vegetation, overgrazing.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Black-breasted Button-quail <i>Turnix melanogaster</i> (also listed as Vulnerable under the NC Act)	One possible record. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	Loss of habitat, grazing, pig predation, frequent and high intensity fire, predation by cats and foxes.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Implement Environmental Management Plan incorporating clearing management, feral animal management, weed management and ecological fire management guidelines.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Brigalow Scaly-foot <i>Paradelma orientalis</i> (also listed as Vulnerable under the NC Act)	506769 ha potential habitat mapped within the study area.	5568.78 ha potential habitat	Habitat loss, habitat fragmentation, grazing, frequent and high intensity fire, predation by cats and foxes.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  The species is difficult to detect and ubiquitous within the study area. Avoidance of Brigalow communities will reduce potential impacts.  Implement Environmental Management Plan incorporating clearing management, feral animal management, weed management and ecological fire management guidelines.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Dunmall's Snake <i>Furina dunmali</i> (also listed as Vulnerable under the NC Act)	268952 ha potential habitat mapped within the study area.	3614.31 ha potential habitat	Habitat loss, possibly weed invasion and grazing, predation by cats and foxes (although little known), exotic grass invasion.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Implement Environmental Management Plan incorporating clearing management, feral animal management, weed management and ecological fire management guidelines.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.

Element and Status/ Qualification	Species	Total hectares mapped within study area	Total hectares proposed for clearing	Identified Threats	Proposed Impact Mitigation Actions	Potential Direct Offset	Potential Indirect Offset
Nationally Significant Fauna EPBC Act Vulnerable (cont.)	Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	One possible record. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Large-eared Pied Bat <i>Chalinolobus dwyeri</i> (also listed as Vulnerable under the NC Act)	One record. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Plains-wanderer <i>Pedionomus torquatus</i> (also listed as Vulnerable under the NC Act)	Vagrant to study area (four records). Would not occur in remnant vegetation within study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Red Goshawk <i>Erythrorichis radiatus</i>	Vagrant to study area (two records), most recently in 1978. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	South-eastern Long-eared Bat <i>Nyctophilus corbeni</i> formerly <i>N. timoriensis</i> (listed as <i>Nyctophilus timoriensis</i> ) (also listed as Vulnerable under the NC Act)	479700 ha potential habitat mapped within the study area.	5381.71 ha potential habitat	Loss and fragmentation of habitat, loss of mature hollow-bearing trees, pesticides, exotic grass fires destroying shrub layers.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Retention of large, hollow-bearing trees in non-remnant vegetation.  Implement Environmental Management Plan incorporating ecological fire management guidelines.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	Program to encourage protection and recruitment of paddock trees on cleared lands within the study area.
	Squatter Pigeon (southern subspecies) <i>Geophaps scripta scripta</i> (also listed as Vulnerable under the NC Act)	433108 ha potential habitat mapped within the study area.	5021.25 ha potential habitat	Loss and fragmentation of habitat, overgrazing, trampling of nests by livestock and feral animals, predation by cats and foxes, illegal shooting.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Implement Environmental Management Plan incorporating feral animal management guidelines.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Yakka Skink <i>Egernia rugosa</i> (also listed as Vulnerable under the NC Act)	486510 ha potential habitat mapped within the study area.	5272.34 ha potential habitat	Loss and fragmentation of habitat, loss of shelter sites including hollow logs, log piles, burrows, frequent and intense fires, trampling of burrows by livestock, predation by cats and foxes.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Retention of large, hollow logs, retention of log piles in paddocks, exclusion of livestock from known colonies.  Implement Environmental Management Plan incorporating feral animal management, weed management and ecological fire management guidelines.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research exotic grass control techniques.  Program to place coarse, woody debris within regrowth vegetation.

APPENDIX O  
TABLE O.3 FAUNA OFFSETS

Element and Status/ Qualification	Species	Total hectares mapped within study area	Total hectares proposed for clearing	Identified Threats	Proposed Impact Mitigation Actions	Potential Direct Offset	Potential Indirect Offset
<b>State Significant Fauna</b> NC Act Endangered	Grey Snake <i>Hemiaspis damelli</i>	71371 ha of potential habitat mapped within the study area.	673.75 ha potential habitat	Loss of habitat, loss of waterbodies and wetlands, cane toads may be a threat.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Implement Environmental Management Plan incorporating feral animal management guidelines.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research Cane Toad control in pond areas created by the Project
<b>State Significant Fauna</b> NC Act Vulnerable	Glossy Black-Cockatoo <i>Calyptrorhynchus lathami</i>	216337 ha of potential habitat mapped within the study area.	2727.93 ha potential habitat	Loss of habitat, frequent and intense fire, grazing that inhibits food tree regeneration, predation of nestlings and eggs as a result of fragmentation, competition for tree hollows.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Protect large, hollow-bearing trees within and outside of remnant vegetation. Include Belah in rehabilitation works.  Implement Environmental Management Plan incorporating ecological fire management guidelines and exclude livestock from burnt patches of Belah to allow regeneration.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Pale Imperial Hairstreak (northern subspecies) <i>Jaclinus eubulus</i>	21387 ha of potential habitat mapped within the study area.	103.1 ha potential habitat	Loss of large stands of old growth acacia woodland.	Survey within 200m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.  Implement Environmental Management Plan incorporating ecological fire management guidelines.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Major Mitchell's Cockatoo <i>Lophochroa leadbeateri</i>	Vagrant to study area (three records). Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
<b>State Significant Fauna</b> NC Act Rare or Near Threatened	Black-chinned Honeyeater <i>Melliphreptus gularis</i>	472177 ha of potential habitat mapped within the study area.	5350.27 ha potential habitat	Loss and fragmentation of habitat.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Black-necked Stork <i>Ephippiorhynchus asiaticus</i>	38741 ha of potential habitat mapped within the study area.	385.66 ha potential habitat	Herbicides, pesticides, loss of nesting trees, disturbance by livestock, ingestion of Cane Toads, loss of wetlands, collision with powerlines.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Common Death Adder <i>Acanthophis antarcticus</i>	216062 ha of potential habitat mapped within the study area.	576.03 ha potential habitat		Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.

APPENDIX O  
TABLE O.3 FAUNA OFFSETS

Element and Status/ Qualification	Species	Total hectares mapped within study area	Total hectares proposed for clearing	Identified Threats	Proposed Impact Mitigation Actions	Potential Direct Offset	Potential Indirect Offset
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Cotton Pygmy-geose <i>Nettapus coromandelianus</i> (also Migratory under the EPBC Act)	Vagrant to study area (one record), pre 1975. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Golden-tailed Gecko <i>Strophurus taenicauda</i>	484360 ha of potential habitat mapped within the study area.	543228 ha potential habitat		Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Freckled Duck <i>Stidionetta naevosa</i>	Vagrant to study area (one record), pre 1975. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Grey Falcon <i>Falco hypoleucos</i>	Very occasional (decadal) visitor. Marginal in study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Grey Goshawk <i>Accipiter novaehollandiae</i>	Vagrant to study area (three records), one record in last decade. Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Lewin's Rail <i>Lewinia pectoralis</i>	Vagrant to study area (four records). Marginal in, or absent from, the study area and offsets are unnecessary.	n/a	n/a	n/a	n/a	n/a
	Little Pied Bat <i>Chalinolobus picatus</i>	525740 ha potential habitat. Twenty-three database and survey records. Study area is of moderate importance to the species.	5827 ha potential habitat.	Habitat loss and fragmentation, loss of roost sites including caves, tunnels, mine shafts.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Painted Honeyeater <i>Grantia picta</i>	38796 ha potential habitat. Uncommon visitor. Study area is of moderate importance to the species.	252 ha potential habitat.	Loss of mistletoe-bearing trees.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.

APPENDIX O  
TABLE O.3 FAUNA OFFSETS

Element and Status/ Qualification	Species	Total hectares mapped within study area	Total hectares proposed for clearing	Identified Threats	Proposed Impact Mitigation Actions	Potential Direct Offset	Potential Indirect Offset
State Significant Fauna NC Act Rare or Near Threatened (cont.)	Rough Frog <i>Cyclorana verrucosa</i>	56521 ha potential habitat. Generally sparse, may be common in suitable habitat. Study area is of high importance to the species.	458 ha potential habitat.	Loss of wetlands, compaction of soils by livestock, predation by feral predators, competition with Cane Toads, degradation of wetlands by Feral Pigs.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	Research Cane Toad control in pond areas created by the Project.
	Square-tailed Kite <i>Lopholathia isura</i>	477965 ha potential habitat. Uncommon breeding resident. Study area is of moderate importance to the species.	5244 ha potential habitat.	Loss and fragmentation of habitat, loss of large trees for nesting, loss of bird prey species by habitat degradation, too frequent and intense fires, illegal shooting, egg collection.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.
	Turquoise Parrot <i>Neophema pulchella</i>	41337 ha potential habitat. Sparse. Study area is of low importance to the species.	396 ha potential habitat.	Habitat loss, loss of hollow- bearing trees, habitat degradation by grazing, illegal trapping, predation by cats and foxes.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Mitigation measures adequate (Tables N.5-N.8). No offset recommended.	None recommended.
	Woma <i>Aspides ramsayi</i>	483848 ha potential habitat. Twenty database records. Known only from western section of study area. Study area is of moderate importance to the species.	5409 ha potential habitat	Predation by feral animals, loss of prey species including rabbits, destruction of burrows.	Survey within 100m buffer of proposed infrastructure and implement species-specific management guidelines under the Environmental Management Plan if species located.	Offset affected habitat (Regional Ecosystems) as a priority within bioregional corridors or connecting remnant patches, with first preference through protection, enhancement and management of analogous regrowth vegetation.	None recommended.

**Appendix P:**  
**EPBC Act Assessment of Impact Significance on Listed**  
**Threatened Ecological Communities, Listed Threatened**  
**Species and Listed Migratory Species**

## EPBC Act Assessment of Impact Significance on Nationally Endangered Ecological Communities within the study area\*

Based on the assessment of existing terrestrial ecological values documented in **Section 2.0** of the main report, the following terrestrial Ecological Communities listed as Endangered under the EPBC Act are currently recognised as occurring within the study area:

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions; and
- Weeping Myall Woodlands.

Reference to any **Section** or **Table** refers to the main report, unless otherwise specified.

Criteria	Assessment of Impact Significance
<b>An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:</b>	<p><b>Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) communities</b>                      Within the study area (<b>Figure 1.1</b> of the main report) this community is analogous to areas mapped as Regional Ecosystems (REs) 11.3.1, 11.4.3, 11.4.7, 11.4.10, 11.9.1, 11.9.5 and 11.9.6 (<b>Appendix I</b>). These REs cover an area of approximately 17,000ha of the study area, representing approximately 14% of that mapped as present in the relevant provinces** of the Brigalow Belt South (BBS) bioregion (<b>Section 2.3.2</b>). There is a potential loss of up to approximately 70ha of this ecological community, which equates to 0.4% of study area extent and 0.06% of the relevant provincial extent.</p> <p>With the possible exception of a very limited number of patches located within State Forest, it was found that much of the Brigalow within the study area has been highly disturbed and is in poor condition due primarily to invasion by Buffel Grass (<b>Section 2.3.2</b>).</p> <p>The following assessment of significance is based on information provided within <b>Section 3.0</b> of the main report and <b>Appendix N</b>.</p>
Reduce the extent of an ecological community.	<p>Disturbance to this ecological community will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of this ecological community will be developed on a case-by-case basis.</p> <p>In addition, areas currently supporting Brigalow that are located within buffers to infrastructure (within the control of the Project) will be managed to control the extent of Buffel Grass and other weed species to ensure the continued persistence of the ecological community within the study area.</p>
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.	<p>Given the fragmented and degraded nature of Brigalow communities within the study area, and the fact that minimal clearing within the analogous REs is proposed at the Project scale, it is unlikely that the proposed action will result in a significant increase in fragmentation of this ecological community. The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>



Criteria	Assessment of Impact Significance
Adversely affect habitat critical to the survival of an ecological community.	Disturbance to this ecological community will be avoided or offset in accordance with <b>Appendix O</b> . Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of this ecological community will be developed on a case-by-case basis. No habitat critical to the survival of this community will be adversely affected.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b> . Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis. Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b> .
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b> . Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis. Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b> . Activities associated with this Project will not cause a substantial change in species composition of this vegetation community.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – Assisting invasive species, that are harmful to the listed ecological community, to become established; or – Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.	Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b> . Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis. Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b> . Activities associated with this Project will not cause a substantial reduction in the quality of this vegetation community.
Interfere with the recovery of an ecological community.	Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b> . Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis. Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened

Criteria	Assessment of Impact Significance
	<p>community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>
<p>An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:</p>	<p><b>Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions</b></p> <p>This ecological community is analogous to areas mapped as REs 11.8.3 and 11.9.4 within the study area (<b>Appendix I</b>). These REs cover an area of approximately 3,600ha of the study area, representing approximately 16% of that mapped as present in the relevant provinces** (<b>Section 2.3.2</b>). There is a potential loss of up to approximately 13ha of this ecological community, which equates to 0.4% of study area extent and 0.06% of the relevant provincial extent.</p> <p>The general condition of this ecological community within the study area varies from patch to patch with some examples in the Gurlmundi area being in comparatively good condition. In general, this ecological community is degraded in the understorey by trampling and cattle grazing, partially preventing regrowth and invasion by exotic pasture grasses is prevalent especially along exposed edges (<b>Section 2.3.2</b>).</p> <p>The following assessment of significance is based on information provided within <b>Section 3</b> and <b>Appendix N</b>.</p>
<p>Reduce the extent of an ecological community.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>In addition, areas currently supporting SEVT that are located within buffers to infrastructure (within the control of the Project) will be managed to control the extent of exotic grasses and other weed species to ensure the continued persistence of the communities within the study area.</p>
<p>Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.</p>	<p>Given the fragmented and degraded nature of SEVT communities within the study area, and the fact that minimal clearing within these REs is proposed at the Project scale, it unlikely that the proposed action will result in a significant increase in fragmentation of this ecological community. The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>
<p>Adversely affect habitat critical to the survival of an ecological community.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis. No habitat critical to the survival of this community will be adversely affected.</p>
<p>Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival,</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p>

Criteria	Assessment of Impact Significance
including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.	Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b> .
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>Activities associated with this Project will not cause a substantial change in species composition of this vegetation community.</p>
<p>Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:</p> <ul style="list-style-type: none"> <li>– Assisting invasive species, that are harmful to the listed ecological community, to become established; or</li> <li>– Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.</li> </ul>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>Activities associated with this Project will not cause a substantial reduction in the quality of this vegetation community.</p>
Interfere with the recovery of an ecological community.	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>

Criteria	Assessment of Impact Significance
<p><b>An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:</b></p>	<p><b>Weeping Myall Open Woodland</b>                      Within the study area, this ecological community potentially occurs within RE 11.3.2 (<b>Section 2.3.2</b>). Recent field surveys have found 30ha of this ecological community within the study area. The majority of this ecological community has been mapped within road reserves (<b>Appendix I</b>). There is a potential loss of up to approximately 129ha of habitat suitable for this ecological community, which equates to 0.9% of study area extent and 0.1% of the relevant provincial extent.                      In general the under storey of this community is in poor condition, being invaded by exotic grasses (<b>Section 2.3.2</b>). The following assessment of significance is based on information provided within <b>Section 3</b> and <b>Appendix N</b>.</p>
<p>Reduce the extent of an ecological community.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.                      In addition, areas currently supporting Weeping Myall Open Woodland that are located within buffers to infrastructure (within the control of the Project) will be managed to control the extent of exotic grass and other weed species to ensure the continued persistence of the communities within the study area.</p>
<p>Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines.</p>	<p>Given the fragmented and degraded nature of Weeping Myall Open Woodland communities within the study area, and the fact that minimal clearing within these REs is proposed at the Project scale, it unlikely that the proposed action will result in a significant increase in fragmentation of this ecological community. The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>
<p>Adversely affect habitat critical to the survival of an ecological community.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p>
<p>Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.                      Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p>
<p>Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.                      Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p>



Criteria	Assessment of Impact Significance
<p>Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:</p> <ul style="list-style-type: none"> <li>– Assisting invasive species, that are harmful to the listed ecological community, to become established; or</li> <li>– Causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community.</li> </ul> <p>Interfere with the recovery of an ecological community.</p>	<p>Activities associated with this Project will not cause a substantial change in species composition of this vegetation community.</p> <p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>Activities associated with this Project will not cause a substantial in the quality of this vegetation community.</p>
<p>Interfere with the recovery of an ecological community.</p>	<p>Disturbance to these Regional Ecosystems will be avoided or offset in accordance with <b>Appendix O</b>. Restrictions will also apply to any clearing outside of already disturbed areas within these ecological communities. Habitat management guidelines for works within 200m of these areas will be developed on a case-by-case basis.</p> <p>Habitat management for works within the 200m buffer will include actions to prevent impacts upon this threatened community including: management of surface and ground waters, weeds infestations, feral animal species, light, wind, temperature and fire. These factors will be monitored and mitigated as appropriate according to prescriptions given in <b>Section 3.5</b>.</p> <p>The recommended offsets (<b>Section 3.6</b> and <b>Appendix O</b>) are also designed to increase overall connectivity of remnant vegetation communities across the local landscape.</p>

\* Does not include EPBC Act listed communities identified from the Online Protected Matters Search Tool but undetected in the study area during current and/or previous surveys and not expected to occur (as determined in **Section 2.3.2** of the main report).

\*\* Relevant provinces include provinces 25, 26, 27, 28, 30, 31 and 32 of the BBS bioregion (**Section 2.3.1** of the main report).

## EPBC Act Assessment of Impact Significance on Nationally Critically Endangered and Endangered Species in the study area\*

Based on the assessment of existing terrestrial ecological values documented in **Section 2** of the main report, the following terrestrial species listed as Endangered under the EPBC Act are currently recognised as occurring or possibly occurring within the study area:

- Herbaceous Xerothamnella Xerothamnella herbacea;
- Slender Tylophora Tylophora linearis;
- Microcarpaea Microcarpaea agonis; and
- Swift Parrot Lathamus discolor.

In addition, the following two undescribed species of land snail are known to occur within the study area from current and previous surveys and, as they are currently in the process of submission to DEWHA for listing under the EPBC Act, they are also considered as part of this assessment:

- Brigalow Woodland Snail (Camaenidae BL13), a description will be published in 2010 in Stanisic *et al.* (in preparation). – currently under submission to DEWHA for listing under the EPBC Act as Critically Endangered and
- Dulacca Woodland Snail (Camaenidae BL12), a description will be published in 2010 in Stanisic *et al.* (in preparation). – currently under submission to DEWHA for listing under the EPBC Act as Endangered.

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a Endangered species if there is a real chance or possibility that it will:</b>	<p><b>Herbaceous Xerothamnella Xerothamnella herbacea</b></p> <p>Found in Brigalow <i>Acacia harpophylla</i> dominated communities in shaded situations, often in leaf litter and in association with gilgais, on heavy, grey to dark brown clay soils. Restricted to the Chinchilla –Goondiwindi region of southern Queensland. Total of nine database record for this species. The presence of this species within the study area has not been confirmed. The study area is of high importance to this species.</p> <p>Potential habitat within the study area includes REs 11.4.10, 11.9.1, 11.3.3, 11.4.3, 11.7.6, 11.4.7, 11.9.5, 11.3.1, 11.3.17 and 11.9.10. There is a proposed loss of approximately 151ha of potential habitat which equates to 0.4% of study area extent and 0.05% of the relevant provincial extent.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in <b>Tables N1 – N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 – N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>

Criteria	Assessment of Significance
	<p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p> <p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>No habitat critical to the survival of this species will be disturbed.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Disrupt the breeding cycle of an <i>important population</i> .	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 83ha of potential habitat (following mitigation), which equates to 0.2% of the extent within the study area and 0.02% of the extent within the relevant provinces** following mitigation. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 83ha of potential habitat (following mitigation), which equates to 0.2% of the extent within the study area and 0.02% of the extent within the relevant provinces** following mitigation. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>



Criteria	Assessment of Significance
	The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of potential habitat, equivalent to 0.4% of the extent within the study area and 0.05% of the extent within the relevant provinces**, will prevent the recovery of this species.

<p><b>An action is likely to have a significant impact on a Endangered species if there is a real chance or possibility that it will:</b></p>	<p><b>Slender Tylophora Tylophora linearis</b>                      Found in dry scrublands, open forests and woodlands in association with Broombush <i>Melaleuca uncinata</i>, Broad-leaved Red Ironbark <i>Eucalyptus fibrosa</i>, Grey Ironbark <i>E. sideroxylon</i>, White Box <i>E. albens</i>, Black Cypress Pine <i>Callitris endlicheri</i>, White Cypress Pine <i>C. glaucophylla</i>, Bulloak <i>Allocasuarina luehmannii</i>, Hakea Wattle <i>Acacia hakeoides</i>, Striped Wattle <i>A. lineata</i>, Myoporums <i>Myoporum</i> spp. and She-oaks <i>Casuarina</i> spp. at low altitudes and on sedimentary flats. One database record for this species. Widely distributed outside of, and not confirmed to be present within, the study area. The study area is of low importance to this species.                      Potential habitat within the study area includes RE 11.7.5. There is a proposed loss of approximately 126ha of potential habitat, representing 0.6% of study area extent and 0.2% of the relevant provincial extent.                      An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in <b>Tables N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>) for application under the Environmental Management Plan for the Project.</p> <p>If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>

Criteria	Assessment of Significance
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>) for application under the Environmental Management Plan for the Project.</p> <p>If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, a reduction of occupancy of an important population is not considered likely provided the proposed mitigation measures are implemented.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>) for application under the Environmental Management Plan for the Project.</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an <i>important population</i> .	It is expected that any disruption to any possible local population of the species would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.</p> <p>There is a proposed loss of approximately 126ha of potential habitat (following mitigation), which equates to 0.6% of the extent within the study area and 0.2% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible application to DEWHA for disturbance is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA. The implementation of these measures is considered sufficient to prevent a decline in this species.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species'	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result

Criteria	Assessment of Significance
habitat.	of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of 126ha of potential habitat, equivalent to 0.6% extent within the study area and 0.2% of the extent within the relevant provinces**, will prevent the recovery of this species.
<b>An action is likely to have a significant impact on a Endangered species if there is a real chance or possibility that it will:</b>	<p><b><u>Microcarpaea Microcarpaea agonis</u></b>                      A wetland species found on the margins of <i>Eleocharis</i> – <i>Cyperus</i> spp. dominated seasonal swamplands. One database record for this species. Widely distributed outside of, and not confirmed to be present within, the study area. The study area is of low importance to this species.                      Potential habitat within the study area includes REs 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.14, 11.3.17, 11.3.18, 11.3.25, 11.3.27b. There is a proposed loss of approximately 631ha of potential habitat (following mitigation), which equates to 1.05% of study area extent and 0.2% of the relevant provincial extent.                      An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in <b>Tables N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>) for application under the Environmental Management Plan for the Project.                      If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.                      As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>) for application under the Environmental Management Plan for the Project.                      If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>



Criteria	Assessment of Significance
	As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, a reduction of occupancy of an important population is not considered likely provided the proposed mitigation measures are implemented.
Fragment an existing <i>important population</i> into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines ( <b>Section 3.5.1</b> ) for application under the Environmental Management Plan for the Project. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an <i>important population</i> .	It is expected that any disruption to any possible local population of the species would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 478ha of potential habitat (following mitigation), which equates to 0.8% of the extent within the study area and 0.12% of the extent within the relevant provinces <sup>**</sup> ). It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible application to DEWHA for disturbance is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA. The implementation of these measures is considered sufficient to prevent a decline in this species.  The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	As the species is only predicted to occur within the study area, and no important populations have been detected

Criteria	Assessment of Significance
	<p>during recent surveys, it is unlikely that the loss of 478ha of potential habitat, equivalent to 0.8% extent within the study area and 0.12% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>
<p><b>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:</b></p>	<p><b>Brigalow Woodland Snail Camaenidae BL13***</b></p> <p>This undescribed species is previously known from scattered populations in remnant Brigalow/woodland vegetation, and all recent records from the study area have been collected from Brigalow habitat on alluvial black soils, mostly remnant vegetation but also one record in a non-remnant vegetation patch.</p> <p>It is recommended that specific site surveys be conducted in potential habitat prior to any Project activities. Should the species be located the habitat would be avoided through maintenance of a 200m buffer between construction activities and mapped habitat. Within the buffer area, threatened species management guidelines (<b>Section 3.5.1</b>) would be implemented through the Environmental Management Plan for the Project, along with weed management and ecological fire management guidelines.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts on fauna species due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
<p>Lead to a long-term decrease in the size of an <i>important population</i> of a species.</p>	<p>Some potential habitat for this species may be lost as a result of the proposed action.</p> <p>Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines (<b>Section 3.5.1</b>) and implementation of the habitat management guidelines (<b>Section 3.5</b>) through the Environmental Management Plan for the Project would prevent any long-term decrease in the size of the population.</p>
<p>Reduce the area of occupancy of an <i>important population</i>.</p>	<p>Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines (<b>Section 3.5.1</b>) and implementation of the habitat management guidelines (<b>Section 3.5</b>) through the Environmental Management Plan for the Project would prevent any reduction in the area of occupancy of the population.</p>
<p>Fragment an existing <i>important population</i> into two or more populations.</p>	<p>Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines (<b>Section 3.5.1</b>) and implementation of the habitat management guidelines (<b>Section 3.5</b>) through the Environmental Management Plan for the Project would prevent any long-term decrease in the size of the population. Should a population be fragmented as a result of the proposed action such fragmentation would be minor and temporary.</p>
<p>Adversely affect <i>habitat critical to the survival of a species</i>.</p>	<p>Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines (<b>Section 3.5.1</b>) and implementation of the habitat management guidelines (<b>Section 3.5</b>) through the Environmental Management Plan for the Project would prevent any adverse effects on habitat critical to the survival of the species.</p>
<p>Disrupt the breeding cycle of an <i>important population</i>.</p>	<p>Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines (<b>Section 3.5.1</b>) and implementation of the habitat management guidelines (<b>Section 3.5</b>) through the Environmental Management Plan for the Project would prevent any adverse effects on habitat critical to the survival of the species.</p>

Criteria	Assessment of Significance
	through the Environmental Management Plan for the Project would prevent any disruption to the breeding cycle of the population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some potential habitat for this species would be lost as a result of the proposed action Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would result in any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species to not be of an extent that is likely to cause the species to decline.
Result in <i>invasive species</i> that are harmful to a endangered species becoming established in the endangered species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the feral species management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of animal diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would result in any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species to not be of an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:</b>	<p><b>Dulacca Woodland Snail Camaenidae BL12***</b></p> <p>This undescribed species is previously known from a single population from a rocky peak, east of Dulacca, and it is now known to encompass the Miles-Dulacca area, wholly within the study area. Soil types where specimens were found include: clay plains, sandy and loamy soils, duricrust and fine-grained sedimentary rocks.</p> <p>Seven new records of the species have now been documented from within the study area in a variety of REs and non-remnant vegetation. Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts on fauna species due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8 in Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Some potential habitat for this species may be lost as a result of the proposed action. Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would prevent any long-term decrease in the size of the population.



Criteria	Assessment of Significance
Reduce the area of occupancy of an <i>important population</i> .	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would prevent any reduction in the area of occupancy of the population.
Fragment an existing <i>important population</i> into two or more populations.	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would prevent any long-term decrease in the size of the population. Should a population be fragmented as a result of the proposed action such fragmentation would be minor and temporary.
Adversely affect <i>habitat critical to the survival of a species</i> .	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would prevent any adverse effects on habitat critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would prevent any disruption to the breeding cycle of the population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some potential habitat for this species would be lost as a result of the proposed action Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would not result in any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species to be of an extent that is likely to cause the species to decline.
Result in <i>invasive species</i> that are harmful to a endangered species becoming 'established in the endangered species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the feral species management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of animal diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Implementation of specific site surveys and maintenance of buffers and/or application of threatened species management guidelines ( <b>Section 3.5.1</b> ) and implementation of the habitat management guidelines ( <b>Section 3.5</b> ) through the Environmental Management Plan for the Project would result in any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species to not be of an extent that is likely to



Criteria	Assessment of Significance
	interfere with the recovery of the species.
<p><b>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:</b></p>	<p><b>Swift Parrot <i>Lathamus discolor</i></b></p> <p>Swift Parrots occur in woodlands, riparian vegetation and remnant patches of mature eucalypts in agricultural areas, though they prefer dry sclerophyll forest (Higgins 1999; NPWS 2003). This species breeds in Tasmania during spring and summer, dispersing widely across south-eastern Australia during winter (NPWS 2003). Movements on the mainland are little understood and the species is considered nomadic and irruptive, moving in response to food resources (Higgins 1999). It is infrequently, though possibly annually, recorded in south-east Queensland, and even less frequently recorded to the west of the ranges.</p> <p>There are three WildNet database records, including one 1885 record, a pre-1975 record whose date and location are uncertain and one 1964 record from within the study area. The species has also been seen an additional three or four times in recent decades in the study area (Eddie 2008). Swift Parrot is a non-breeding winter migrant which is a very occasional and unpredictable visitor to the study area. Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	A portion of potential habitat for this species would be lost as a result of the proposed action. Although mitigation is not recommended specifically for this species due to its very occasional visitor status in the study area the relevant habitats will be mitigated for under State listed species such as Square-tailed Kite <i>Lophoictinia isura</i> . The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	There are less than 10 known records of the species in the study area and its surrounds since 1885 and no important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	A paucity of historical records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	This species breeds in Tasmania during spring and summer, dispersing widely across south-eastern Australia during winter. A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.

Criteria	Assessment of Significance
Result in <i>invasive species</i> that are harmful to an endangered species becoming established in the endangered species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the feral species management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of animal diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would interfere with the recovery of the species.

\*Does not include EPBC Act listed species obtained from the Online Protected Matters Search Tool and/or database searches but undetected in the study area during current and/or previous surveys and not expected to occur (as determined in **Appendix J**).

\*\*\*Relevant provinces include provinces 25, 26, 27, 28, 30, 31 and 32 of the BBS bioregion (**Section 2.3.1** of the main report).

\*\*\*Undescribed species, alpha-numeric code is as cited in Queensland Museum database.

### EPBC Act Assessment of Impact Significance on Nationally Vulnerable Species in the study area\*

Based on the assessment of existing terrestrial ecological values documented in **Section 2.0** of the main report, the following terrestrial species listed as Vulnerable under the EPBC Act are currently recognised as occurring or possibly occurring within the study area:

- Dunmore Mint-bush *Prostanthera* sp. *Dunmore*;
- Chinchilla Wattle *Acacia chinchillensis*;
- Curly-barked Wattle *Acacia curranii*;
- Tara Wattle *Acacia lauta*;
- Thomby Range Wattle *Acacia wardellii*;
- Gurulmundi Fringe Myrtle *Calytrix gurulmundensis*;
- Shiny-leaved Ironbark *Eucalyptus virens*;
- Pink Donkey-orchid *Diuris tricolor*;
- Cobar Greenhood Orchid *Pterostylis cobarensis*;
- Belson's Panic Grass *Homopholis belsonii*;
- The Waxflower *Philothea sporadica*;
- Ooline *Cadellia pentastylis*;
- Central Queensland Zamia Palm *Macrozamia fearnsidei*;
- Adorned (Collared) Delma *Delma torquatus*;
- Brigalow Scaly-foot *Paradelma orientalis*;
- Yakka Skink *Egernia rugosa*;
- Dunmall's Snake *Furina dunmalli*;
- Squatter Pigeon (southern subspecies) *Geophaps scripta scripta*;
- Red Goshawk *Erythrorhynchus radiatus*;
- Plains-wanderer *Pedionomus torquatus*;
- Australian Painted Snipe *Rostratula australis*;
- Black-breasted Button-quail *Turnix melanogaster*;
- Grey-headed Flying-fox *Pteropus poliocephalus*;
- Large-eared Pied Bat *Chalinolobus dwyeri*; and
- South-eastern (Greater) Long-eared Bat *Nyctophilus corbeni* (formerly *timoriensis*).

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Dunmore Mint-bush <i>Prostanthera sp. Dunmore</i></b>                      This species is restricted to near Millmerran in south-east Queensland. Presence of this species has not been confirmed during present surveys. The known distribution of this species suggests that the study area is potentially of high importance to this species.                      Found in <i>Eucalyptus</i> - <i>Callitris</i> woodlands in shallow sandy soils and eucalypt woodlands on hard sandstone ridge tops analogous to RE 11.10.11.                      Potential Habitat REs 11.10.11.                      There is a proposed loss of approximately 126ha of potential habitat, which equates to 1.7% of the extent within the study area and 0.1% of the extent within the relevant provinces**.                      An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.                      As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, this native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have failed to confirm its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.                      As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, a reduction of occupancy of an important population is not considered likely provided the proposed mitigation measures are implemented.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located</p>



Criteria	Assessment of Significance
	<p>avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an <i>important population</i> .	It is expected that any disruption to any possible local population of the species would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 126ha of potential habitat, which equates to 1.7% of the extent within the study area and 0.1% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implementation of a translocation plan according to Australian Network for Plant Conservation (2004) would be required (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA. The implementation of these measures is considered sufficient to prevent a decline in this species.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
Introduce disease that may cause the species to decline.	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
Interfere with the recovery of the species.	<p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of 126ha of potential habitat, equivalent to 1.7% of the extent within the study area and 0.1% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Chinchilla Wattle <i>Acacia chinchillensis</i></b>                      Restricted to the Chinchilla region in Southern Queensland. Total of 61 database records for this species. Presence has been confirmed during present survey. Distribution of this species suggests that the study area is of high importance to this species.</p> <p>Found in open forests dominated by Narrow-leaved Red Ironbark, Smooth-barked Apple and Narrow-leaved Box and in association with Bullock, Black Cypress Pine, White Cypress Pine, White Feather Honey-myrtle <i>Melaleuca decora</i>, the Wattle - <i>Acacia crassa</i>, Crowded-leaf Wattle <i>A. conferta</i>, Mueller's Wattle <i>A. muelleriana</i>, Urn-heath <i>Melichrus urceolatus</i> and Prickly Mirbelia <i>Mirbelia pungens</i>, in deep loamy to sandy loam soils often with poor drainage and low nutrient levels, on gently undulating flat plains at 340 –380m altitude. Also recorded in Silver-leaved Ironbark – Coastal Cypress Pine <i>C. columellaris</i> – She-oak (<i>Casuarina</i> spp.) woodlands.</p> <p>Restricted to the Chinchilla region in the Darling Downs, southern Queensland. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.).</p> <p>Potential habitat REs 11.5.1, 11.5.4, 11.5.21, 11.7.4, 11.7.5, 11.7.6, 11.3.18, 11.5.5.</p> <p>There is a proposed loss of approximately 3840ha of potential habitat, which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If located avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA. With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>

Criteria	Assessment of Significance
Fragment an existing <i>important population</i> into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA. The combination of prescribed measures will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an <i>important population</i> .	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 3840ha of potential habitat, which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	It is unlikely that the loss of potential habitat, equivalent to 1% of the extent within the study area and 0.3% of the extent within the relevant provinces**, will prevent the recovery of this species.



Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Curly-barked Wattle <i>Acacia curranii</i></b>                      Restricted to Gurulmundi, Darling Downs District in Queensland and Shepherds Hill and Kilparney, South Western Plains, New South Wales. Total of 27 database records for this species. Presence of this species within the study area has not been confirmed. Distribution of this species suggests that the study area is of high importance to this species.                      Found in dry sclerophyll forests and semi-arid woodlands on rocky outcrops of isolated hills and ranges on skeletal soils. Gurulmundi populations are just to the immediate east of the study area (Craig Eddie pers. comm.).                      Potential Habitat REs 11.7.5, 11.3.18, 11.7.2.                      There is a proposed loss of approximately 37ha of potential habitat representing 2.5% of the habitat available within the Gurulmundi region.                      An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.                      With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If disturbance is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.                      With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been recommended in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If disturbance to a known population of this species is unavoidable consultation with DEWHA for disturbance</p>

Criteria	Assessment of Significance
	<p>conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>No habitat critical to the survival of this species will be disturbed.</p> <p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 37ha of potential habitat representing 2.5% of the habitat available within the Gurulmundi region. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA. The implementation of these measures is considered sufficient to prevent a decline in this species.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species</p> <p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p> <p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p> <p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of potential habitat, equivalent to representing 2.5% of the habitat available within the Gurulmundi region will prevent the recovery of this species.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	
Disrupt the breeding cycle of an <i>important population</i> .	
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	
Introduce disease that may cause the species to decline.	
Interfere with the recovery of the species.	
<b>An action is likely to have a significant impact on a vulnerable species if there is</b>	<b>Tara Wattle <i>Acacia lauta</i></b> Restricted to the Inglewood – Tara region in the Darling Downs district of southern Queensland. The presence of

Criteria	Assessment of Significance
<b>a real chance or possibility that it will:</b>	<p>this species within the study area has been confirmed. Total of eight database records for this species. Distribution records for this species suggest that the study area is of moderate importance to this species. Found in open woodlands in sandy soils. Shrubby woodlands with Narrow-leaved Red Ironbark, Tumble-down Ironbark <i>Eucalyptus panda</i>, Broombush and other <i>Acacia</i> species and <i>Triodia</i> species (Craig Eddie pers. comm.). Potential Habitat REs 11.7.4, 11.7.5, 11.7.7, 11.3.3, 11.3.17, 11.3.18, 11.4.12, 11.9.1. There is a proposed loss of approximately 1679ha of potential habitat, which equates to 0.9% of the extent within the study area and 0.4% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>This species is known to occur within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health has been advised in the prescriptions for threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable application to DEWHA for disturbance is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	<p>No habitat critical to the survival of this species will be disturbed.</p>



Criteria	Assessment of Significance
Disrupt the breeding cycle of an <i>important population</i> .	It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable application to DEWHA for disturbance is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 1679ha of potential habitat, which equates to 0.9% extent within the study area and 0.4% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.  The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming 'established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	It is unlikely that the loss of potential habitat, equivalent to 0.9% of the extent within the study area and 0.4% of the extent within the relevant provinces**, will prevent the recovery of this species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<b>Thomby Range Wattle <i>Acacia wardellii</i></b> Restricted to south of Roma, south-west of Chinchilla and the Thomby Range, near Surat, southern Queensland. Total of 13 database records for this species. Known to occur within Talinga/Orana tenement (Craig Eddie pers. comm.). Distribution records suggest that the study area is of moderate importance to this species.  Found in eucalypt woodland in gravelly soils on shallow weathered sandstone. Occurs on ridge crests and slopes with loamy and gravelly soil along the edges of woodlands or in clearings: occurs with Dusky leaved Ironbark <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> , Narrow-leaved Red Ironbark <i>E. crebra</i> , Queensland Peppermint <i>E. exserta</i> , Brown Bloodwood <i>Corymbia trachyphloia</i> , White Cypress Pine <i>Callitris glaucophylla</i> , Smooth-barked Apple <i>Angophora leiocarpa</i> , Native Quinine <i>Alstonia constricta</i> and Bulloak <i>Allocasuarina luehmannii</i> and various wattles ( <i>Acacia</i> spp.) (Eddie 2007).

Criteria	Assessment of Significance
	<p>Potential habitat REs 1.9.9, 11.5.21, 11.7.6, 11.7.2, 11.7.7, 11.7.4, 11.10.1, 11.10.9, 11.10.11, 11.7.5.</p> <p>There is a proposed loss of approximately 2113ha of potential habitat, which equates to 0.8% of the extent within the study area and 0.2% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
<p>Lead to a long-term decrease in the size of an <i>important population</i> of a species.</p>	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
<p>Reduce the area of occupancy of an <i>important population</i>.</p>	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
<p>Fragment an existing <i>important population</i> into two or more populations.</p>	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>). If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
<p>Adversely affect <i>habitat critical to the survival of a species</i>.</p>	<p>No habitat critical to the survival of this species will be disturbed.</p>
<p>Disrupt the breeding cycle of an <i>important population</i>.</p>	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and</p>

Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>implement a translocation plan according to Australian Network for Plant Conservation (2004) (Tables N1 - N4, Appendix N). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 2113ha of potential habitat, which equates to 0.8% extent within the study area and 0.2% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis if avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (Tables N1 - N4, Appendix N). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in Section 3.5.3 are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
Introduce disease that may cause the species to decline.	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (Section 3.5.3) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
Interfere with the recovery of the species.	<p>It is unlikely that the loss of potential habitat, equivalent to 0.8% of the extent within the study area and 0.2% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>

<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b>Gurulmundi Fringe Myrtle <i>Calytrix gurulmundensis</i></b>                      Restricted to the Gurulmundi, Guluguba and Barakula area in southern Queensland. This species has a confirmed presence within the study area. Distribution records for this species suggest that the study area is of high importance to this species.</p> <p>Found in open scrublands with sparse stunted <i>Eucalyptus</i>, <i>Acacia</i> and <i>Casuarina</i> species on ridge tops and <i>Spinifex</i> hummock grasslands with scattered shrubs in yellow lateritic sandy clay, shallow red gravelly soils on sandstone. Associated with Catkin Wattle <i>Acacia julifera</i>, Threadybark Oak <i>Allocasuarina inophloia</i>, and Brown Bloodwood <i>Corymbia trachyphloia</i>. Potential Habitat REs 11.7.6, 11.7.2, 11.7.5, 11.7.4, 11.7.7.</p> <p>There is a proposed loss of approximately 37ha of potential habitat, which equates to 2.5% of the extent of habitat within the Gurulmundi region).</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning is provided in Tables N1 - N4, Appendix N.</p>
---	---



Criteria	Assessment of Significance
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If disturbance of a known population is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an <i>important population</i> .	It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat	The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.



Criteria	Assessment of Significance
to the extent that the species is likely to decline.	There is a proposed loss of approximately 37ha of potential habitat, which equates to 2.5% of the extent within the Gurulmundi region). It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA. The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	It is unlikely that the loss of potential habitat, equivalent to 2.5% of the extent of habitat within the Gurulmundi region will prevent the recovery of this species.

<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b>Shiny-leaved Ironbark <i>Eucalyptus virens</i></b>  Restricted to four disjunct localities near Mt Moffatt in the Camarvon area, Brovinia south of Mundubbera, Tara west of Dalby and Coolmunda Dam east of Inglewood in southern Queensland. Total of three database records for this species. The presence of this species has not been confirmed within the study area. Distribution records for this species suggest that the study area is of moderate importance to this species.</p> <p>Found in woodlands dominated by Queensland Peppermint <i>Eucalyptus exserta</i>, <i>Angophora costata</i>, Tom Russell's Mahogany <i>Lysicarpus ternifolius</i> and Woolly She-oak <i>Allocasuarina fibrosa</i>, in coarse sandy, skeletal soils on outcropping sandstone escarpments; forests dominated by Bullock <i>Allocasuarina luehmannii</i> and Narrow-leaved Red Ironbark <i>E. crebra</i> in shallow, grey sandy soils on flat lands; and woodlands dominated by Queensland peppermint <i>E. exserta</i>, the Smooth-barked Apple <i>Angophora leiocarpa</i> and Woolly She-oak <i>Allocasuarina fibrosa</i>, in coarse white sandy soils over sandstone on undulating lands.</p> <p>Potential Habitat REs 11.5.4, 11.7.7, 11.7.5, 11.7.4.</p> <p>There is a proposed loss of approximately 1679ha of potential habitat, which equates to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
---	---

Criteria	Assessment of Significance
Lead to a long-term decrease in the size of an important population of a species.	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an important population.	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing important population into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect habitat critical to the survival of a species.	<p>No habitat critical to the survival of this species will be disturbed.</p>
Disrupt the breeding cycle of an important population.	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>

Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.</p> <p>There is a proposed loss of approximately 1679ha of potential habitat, which equates to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
Introduce disease that may cause the species to decline.	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
Interfere with the recovery of the species.	<p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of potential habitat, equivalent to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>

<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b>Pink Donkey-orchid <i>Diuris tricolor</i></b></p> <p>Restricted to coastal ranges of eastern Australia from south-east Queensland to the New South Wales – Victoria border. Total of seven database records. The presence of this species within the study area has been confirmed. Distribution records for this species suggest that the study area is of low importance to this species.</p> <p>Found in sclerophyll forests and ironbark-acacia shrublands in association with White Cypress Pine <i>Callitris glaucophylla</i>, Poplar Box <i>Eucalyptus populnea</i>, Gum Coolibah <i>Eucalyptus intertexta</i> and often with a grassy to herbaceous understorey, in sandy soils on flats and small rises and sometimes red earths.</p> <p>Potential habitat REs 11.10.9, 11.3.39, 11.9.7, 11.7.2, 11.7.5, 11.7.4, 11.3.4, 11.3.19, 11.5.20, 11.7.7, 11.3.2, 11.3.14, 11.5.1, 11.5.4, 11.7.6, 11.3.25, 11.5.5, 11.10.1, 11.10.11, 11.9.10, 11.10.9, 11.3.18.</p> <p>There is a proposed loss of approximately 5890ha of potential habitat, which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in <b>Tables N1 - N4, Appendix N</b>.</p>
---	---



Criteria	Assessment of Significance
Lead to a long-term decrease in the size of an important population of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an important population.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing important population into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect habitat critical to the survival of a species.	<p>No habitat critical to the survival of this species will be disturbed.</p>
Disrupt the breeding cycle of an important population.	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>

Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 5890ha of potential habitat (following mitigation), which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The implementation of these measures is considered sufficient to prevent a decline in this species.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
Introduce disease that may cause the species to decline.	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
Interfere with the recovery of the species.	<p>As the species is only predicted to occur within the study area, and no important populations have been detected during recent surveys, it is unlikely that the loss of potential habitat, equivalent to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	<p><b>Cobar Greenhood Orchid <i>Pterostylis cobarensis</i></b> Restricted to central eastern Australia from the Darling Downs in southern Queensland south to Oryngan-Cobar-Bourke region in New South Wales and west to eastern South Australia. A total of six database records for this species. This species has a confirmed present within the study area. Distribution records for this species suggest that the study area is of low importance to this species.</p> <p>Found in eucalypt woodlands, open mallee and cypress pine shrubland in skeletal sandy loam soils on low stony ridges and slopes and in association with Morris' Grey Mallee <i>Eucalyptus morrisii</i>, Green Mallee <i>Eucalyptus viridis</i>, Gum Coolibah <i>Eucalyptus intertexta</i>, Manara Hills Red Gum <i>E. vicina</i>, White Cypress Pine <i>Callitris glaucophylla</i>, Wilga <i>Geijera parviflora</i>, Belah <i>Casuarina cristata</i>, Spearwood <i>Acacia doratoxylon</i>, Cassias (<i>Senna</i> spp.) and Emu Bushes (<i>Eremophila</i> spp.).</p> <p>Potential habitat REs 11.7.6, 11.7.2, 11.7.7, 11.7.5, 11.7.4, 11.10.9, 11.5.2, 11.5.4, 11.5.21, 11.5.5, 11.10.1.</p> <p>There is a proposed loss of approximately 4944ha of potential habitat, which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning,</p>

Criteria	Assessment of Significance
	is provided in Tables N1 - N4, Appendix N.
Lead to a long-term decrease in the size of an important population of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an important population.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing important population into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an important population.	It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.



Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.</p> <p>There is a proposed loss of approximately 4944ha of potential habitat, which equates to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
Result in <i>invasive</i> species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
Introduce disease that may cause the species to decline.	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
Interfere with the recovery of the species.	<p>It is unlikely that the loss of potential habitat, equivalent to 1.1% of the extent within the study area and 0.3% of the extent within the relevant provinces**, will prevent the recovery of this species.</p>
<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b>Belson's Panic Grass <i>Homopholis belsonii</i></b>  Restricted to the Darling Downs region in southern Queensland to the north-west slopes of northern New South Wales. Total of seven database records. The presence of this species within the study area has been confirmed. Distribution records for this species suggest that the study area is of moderate importance to this species.</p> <p>Found in White Box <i>Eucalyptus albens</i> communities and Wilga <i>Geijera parviflora</i> woodlands on rocky hills; Belah <i>Casuarina cristata</i> forests in alluvial soils on flat to undulating lands; Poplar Box <i>E. populnea</i> woodlands; and dry woodlands on poor soils derived from basalt at 200 – 520m altitude. Also recorded in Brigalow <i>Acacia harpophylla</i>, Myall <i>Acacia melvillei</i> and Weeping Myall <i>A. pendula</i> communities; Mountain Coolibah <i>E. orgadophila</i> communities; and on roadsides.</p> <p>Potential habitat REs 113.17, 11.9.6, 11.3.1, 11.4.3, 11.4.7, 11.9.5, 11.3.2.</p> <p>There is a proposed loss of approximately 198ha of potential habitat, which equates to 1% of the extent within the study area and 0.1% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning is provided in <b>Tables N1 - N4, Appendix N</b>.</p>

Criteria	Assessment of Significance
Lead to a long-term decrease in the size of an important population of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Reduce the area of occupancy of an important population.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing important population into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an important population.	It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.

Criteria	Assessment of Significance
<p>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>	<p>The study area could not be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.</p> <p>There is a proposed loss of approximately 198ha of potential habitat, which equates to 1% of the extent within the study area and 0.1% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.</p>
<p>Result in <i>invasive</i> species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.</p>	<p>The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.</p>
<p>Introduce disease that may cause the species to decline.</p>	<p>The implementation of the weed management guidelines within the Environmental Management Plan for the Project (<b>Section 3.5.3</b>) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.</p>
<p>Interfere with the recovery of the species.</p>	<p>It is unlikely that any unforeseen loss of potential habitat will prevent the recovery of this species.</p>
<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b><i>Macrozamia fearnsidei</i></b>  Known from sandstone escarpments of the Great Dividing Range north of Injune and Taroona, in central Queensland. Recorded from within 2.3km of the study area boundary at the extreme north-western end (Beilba/Kentucky area) (QLD Herbarium records). Total of one (1) database record. The presence of this species within the study area has not been confirmed. Distribution records for this species suggest that the study area is of low importance to this species.</p> <p>Occurs in open woodlands of Large-fruited Yellow Jacket, Lemon-scented Spotted Gum and Budgeroo.</p> <p>Potential habitat REs 11.10.13, 11.10.1, 11.10.4, 11.10.3, 11.10.7, 11.10.9, 11.10.11.</p> <p>There is a proposed loss of approximately 574ha potential habitat (1% of the extent within the study area and 0.1% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning is provided in <b>Tables N1 - N4, Appendix N</b>.</p>
<p>Lead to a long-term decrease in the size of an important population of a species.</p>	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and</p>



Criteria	Assessment of Significance
	<p>monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
<p>Reduce the area of occupancy of an important population.</p>	<p>Searches for this species have not confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary any reduction in the area of occupancy will be minor, whether or not any such population would be considered an important population.</p>
<p>Fragment an existing important population into two or more populations.</p>	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
<p>Adversely affect habitat critical to the survival of a species.</p>	<p>No habitat critical to the survival of this species will be disturbed.</p>
<p>Disrupt the breeding cycle of an important population.</p>	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
<p>Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to</p>	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 574ha of potential habitat, which equates to 1% of the extent within the</p>

Criteria	Assessment of Significance
decline.	study area and 0.1% of the extent within the relevant provinces**. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.  The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive</i> species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	As the species is only predicted to occur within the study area, and no important population has been detected during recent surveys, it is unlikely that the loss of potential habitat, equivalent to 1% of the extent within the study area and 0.1% of the extent within the relevant provinces**, will prevent the recovery of this species.

<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>a Waxflower <i>Philotheca sporadica</i></b>                      Restricted to north of Tara approximately 12km east of Kogan in the Darling Downs District, in south-eastern Queensland. Total of 31 database records. The presence of this species within the study area has been confirmed. Distribution records for this species suggest that the study area is of high importance to this species. Found in low open acacia and eucalypt forest in shallow uniform sandy loams to clay loams on residual hills of laterised Cretaceous sandstones.                      Potential Habitat REs 11.4.10, 11.5.1, 11.5.4, 11.7.6, 11.7.2, 11.7.7, 11.7.5, 11.7.4, 11.5.21, 11.3.18.                      There is a proposed loss of approximately 37ha of potential habitat representing 2.5% of the total available habitat within the Gurulmundi region.                      An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in <b>Tables N1 - N4, Appendix N</b>.</p> <p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).                      If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and</p>
Lead to a long-term decrease in the size of an important population of a species.	

Criteria	Assessment of Significance
	implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA. With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an important population.	Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management ( <b>Section 3.5.1</b> ). If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA. With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.
Fragment an existing important population into two or more populations.	Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines ( <b>Section 3.5.1</b> ). If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA. The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an important population.	It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 37ha of potential habitat representing 2.5% of the total available habitat within the Gurulmundi region. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) ( <b>Tables N1 - N4, Appendix N</b> ). If offsets are necessary they will be made by agreement with DEWHA.



Criteria	Assessment of Significance
	The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to mitigate any possible decline in this species.
Result in <i>invasive</i> species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	It is unlikely that the loss of potential habitat, equivalent to 2.5% of the total available habitat within the Gurulmundi region will prevent the recovery of this species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Ooline Cadellia pentastylis</b> Known to occur within the Wooleebee tenement, between Jackson – Wandoan Road and Gurulmundi State Forest. Widely distributed outside of the study area, with 15 database records. The presence of this species within the study area has been confirmed. The Project is of moderate importance to the overall conservation of this species.</p> <p>Found in Semi-evergreen Vine Thickets in association with Native Quinine, Hard Alectryon <i>Alectryon subdentatus</i>, Leopard Ash <i>Flindersia collina</i>, Wilga and Narrow-leaved Bottle Tree <i>Brachychiton rupestris</i> on sandstone and basalt slopes and Currajong, Brigalow and Belah communities on undulating clay plains and low hills at altitudes 200 – 500m.</p> <p>Potential Habitat REs 11.9.4, 11.9.5, 11.7.2, 11.9.10, 11.9.1. There is a proposed loss of approximately 800ha of potential habitat (following mitigation), which equates to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces**.</p> <p>An assessment of impacts on flora species due to construction and clearing, and operation and decommissioning, is provided in Tables <b>N1 - N4, Appendix N</b>.</p>
Lead to a long-term decrease in the size of an important population of a species.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not</p>

Criteria	Assessment of Significance
	considered significant provided the proposed mitigation measures are implemented.
Reduce the area of occupancy of an important population.	<p>Searches for this species have confirmed its presence within the study area. Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur, avoidance, buffering and monitoring for long-term health has been advised in the guidelines for threatened species management (<b>Section 3.5.1</b>).</p> <p>If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>With the provision of appropriate habitat offsets and translocation plans where necessary, native habitat loss is not considered significant provided the proposed mitigation measures are implemented.</p>
Fragment an existing important population into two or more populations.	<p>Site specific searches will be conducted for this species in suitable habitat proposed to be disturbed. If found to occur avoidance, buffering and monitoring for long-term health will be incorporated into the threatened species management guidelines (<b>Section 3.5.1</b>).</p> <p>If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of the measures prescribed above will mitigate or avoid fragmentation of existing important populations.</p>
Adversely affect habitat critical to the survival of a species.	No habitat critical to the survival of this species will be disturbed.
Disrupt the breeding cycle of an important population.	<p>It is expected that any disruption to any possible local population of the species would be minor and temporary. If disturbance to a known population of this species is unavoidable, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>The study area could be considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline. There is a proposed loss of approximately 800ha of potential habitat (following mitigation), which equates to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces*. It is intended to search for the presence of this species and avoid populations where found on a site-by-site basis. If avoidance is not possible, consultation with DEWHA for disturbance conditions is recommended. Design and implement a translocation plan according to Australian Network for Plant Conservation (2004) (<b>Tables N1 - N4, Appendix N</b>). If offsets are necessary they will be made by agreement with DEWHA.</p> <p>The combination of avoidance where possible, translocation and/or habitat offset is considered sufficient to</p>

Criteria	Assessment of Significance
	mitigate any possible decline in this species.
Result in <i>invasive</i> species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of weed management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.3</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of the weed management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.3</b> ) will assist in the prevention of the introduction of plant diseases as a result from the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	It is unlikely that the loss of potential habitat, equivalent to 0.9% of the extent within the study area and 0.2% of the extent within the relevant provinces**, will prevent the recovery of this species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<b>Adorned (Collared) Delma <i>Delma torquatus</i></b> This species shelters in soil cracks, leaf litter and under rocks in open eucalypt forest with a shrub and tussock grass understorey. The soil type is usually shallow and deep-cracking or stony (Ehmann 1992; Wilson and Swan 2008). There is one published record for the study area (Hines <i>et al.</i> 2000). There is no database record. Known or potential use of the study area is summarised in <b>Appendix J</b> , while RE use within the relevant bioregional province is provided in <b>Table 2.12</b> . An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b> . Some potential habitat for this species would be lost as a result of the proposed action. Mitigation is not recommended for this species due to its apparent marginal distribution within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species. There is a single record from the study area and its surrounds and no important population is known for the study area. If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur. A paucity of historical records indicates that there is no habitat present that is critical to the survival of the species. A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	
Reduce the area of occupancy of an <i>important population</i> .	
Fragment an existing <i>important population</i> into two or more populations.	
Adversely affect <i>habitat critical to the survival of a species</i> .	
Disrupt the breeding cycle of an <i>important population</i> .	



Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would interfere with the recovery of the species.
<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p> <p>Lead to a long-term decrease in the size of an <i>important population</i> of a species.</p>	<p><b>Brigalow Scaly-foot <i>Paradelma orientalis</i></b></p> <p>The Brigalow Scaly-foot was once thought to be confined to remnant Brigalow <i>Acacia harpophylla</i> or sparse tussock grass vegetation on grey cracking soils (Shea 1987). Recent records, however, have found the species in additional habitats including <i>Acacia falciiformis</i> woodland, Gidgee <i>A. cambagei</i> woodland, Poplar Box <i>Eucalyptus populnea</i> open woodland, sandstone rises in dry sclerophyll forests, Spotted Gum <i>Corymbia maculata</i> and Narrow-leaved Red Ironbark <i>E. crebra</i> dominated forest and mixed open woodland with Spinifex <i>Triodia mitchelli</i> (Schulz and Eyre 1997; Kutt <i>et al.</i> 2003). Most records are from relatively undisturbed habitats but the species does also occur in young regrowth (two-three years old) and heavily grazed areas (Kutt <i>et al.</i> 2003). Fragments of invertebrates such as spiders and crickets have been recorded from scats. However, sap, particularly from <i>Acacia</i> species, constitutes a significant proportion of this species diet (Tremul 2000).</p> <p>There are 16 WildNet database records and two Queensland Museum database records for the study area. There was one BAAM survey record in the study area. Based on database records and known habitat preferences the species could be expected to occur throughout the study area.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8 in Appendix N</b>.</p>
	5623ha of potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located.

Criteria	Assessment of Significance
	Habitat offsets have been recommended. With the combination of habitat management and habitat offsetting, the result of the proposed action would not significantly reduce the local extent of these habitats. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.
Reduce the area of occupancy of an <i>important population</i> .	With the combination of habitat management and habitat offsetting, the result of the proposed action would not significantly reduce the local area of occupancy. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.
Fragment an existing <i>important population</i> into two or more populations.	It is expected that habitat offsets will be concentrated within bioregional corridors and to link remnant patches through replanting currently cleared lands with relevant pre-clearing REs. Should an existing important population be fragmented as a result of the proposed action such fragmentation would be minor and temporary.
Adversely affect <i>habitat critical to the survival of a species</i> .	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, the result of the proposed action would not adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, any disruption of the breeding cycle of a local population, regardless of whether or not it is considered an important population, as a result of the proposed action would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to cause the species to decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to interfere with the recovery of the species.

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Yakka Skink <i>Egernia rugosa</i></b>                      Yakka Skinks live in colonies, occupying communal burrows, often under dead timber or deep rock crevices. They are found in dry open forests and woodlands, usually on coarse gritty soils that are well drained (Ehmann 1992; Cogger 2000; Drury 2001; Wilson 2005). The species is threatened by loss of habitat, loss of shelter sites through agricultural practices, too-frequent fire, trampling of burrows by livestock and predation by foxes and cats (Drury 2001).</p> <p>There are two WildNet database records and two Queensland Museum database records from the study area and its surrounds. A colony is also currently known from the study area (Eddie 2008). This is a secretive species that occurs in a variety of habitats and could be widespread in the study area.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>5326ha of potential habitat for this species would be lost as a result of the proposed action.</p> <p>It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. It is proposed that log piles in paddocks and large, hollow logs be retained and that livestock is excluded from known colonies. Feral animal, weed and ecological fire management guidelines will be implemented (<b>Section 3.5</b>).</p> <p>Habitat offsets have been recommended. With mitigation through offsetting, the result of the proposed action would not significantly reduce the local extent of these habitats. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.</p>
Reduce the area of occupancy of an <i>important population</i> .	<p>With the combination of habitat management and habitat offsetting, the result of the proposed action would not significantly reduce the local area of occupancy. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.</p>
Fragment an existing <i>important population</i> into two or more populations.	<p>Offsets will be concentrated within bioregional corridors, situated to link remnant patches through replanting currently cleared lands with relevant pre-clearing REs. Should an existing important population be fragmented as a result of the proposed action such fragmentation would be minor and temporary.</p>
Adversely affect <i>habitat critical to the survival of a species</i> .	<p>Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure, implement management guidelines if the species located and exclude livestock from any known colonies. With the combination of habitat management and habitat offsetting, the result of the proposed action would not adversely affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an <i>important population</i> .	<p>Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure, implement management guidelines if the species located and exclude livestock from any known colonies. With the combination of habitat management and habitat offsetting,</p>



Criteria	Assessment of Significance
	any disruption of the breeding cycle of a local population, regardless of whether or not it is considered an important population, as a result of the proposed action would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to cause the species to decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to interfere with the recovery of the species.

<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Dunmall's Snake <i>Furina dunmali</i></b></p> <p>This species is highly cryptic, extremely secretive and possibly genuinely scarce. Only a handful of records occur within any given decade. Consequently, the biology of the snake is virtually unknown. Most records appear in open forests and woodlands, particularly brigalow and woodlands growing on cracking black clay and clay loams (Cogger <i>et al.</i> 1993). However, the species has also been recorded from dry eucalypt forests and anecdotal evidence suggests it may even occur in vine thickets.</p> <p>There are four WildNet database records (one pre-1975 and three in 2009), two Queensland Museum database records, 1978 and 2000. This is a little known species whose habitats requirements and distribution are poorly understood. It could be widespread at low densities throughout the study area.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>3629ha of potential habitat for this species would be lost as a result of the proposed action.</p> <p>It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located.</p> <p>Habitat offsets have been recommended. With the combination of habitat management and habitat offsetting, the</p>

Criteria	Assessment of Significance
	result of the proposed action would not significantly reduce the local extent of these habitats. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.
Reduce the area of occupancy of an <i>important population</i> .	With the combination of habitat management and habitat offsetting, the result of the proposed action would not significantly reduce the local area of occupancy. It is expected that any possible decrease in any possible local population, whether or not that population is considered an important population, would be minor and temporary.
Fragment an existing <i>important population</i> into two or more populations.	Offsets will be concentrated within bioregional corridors, situated to link remnant patches through replanting currently cleared lands with relevant pre-clearing REs. Should an existing important population be fragmented as a result of the proposed action such fragmentation would be minor and temporary.
Adversely affect <i>habitat critical to the survival of a species</i> .	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With mitigation through offsetting ( <b>Tables O.1</b> and <b>O.3</b> in <b>Appendix O</b> ), the result of the proposed action would not adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, any disruption of the breeding cycle of a local population, regardless of whether or not it is considered an important population, as a result of the proposed action would be minor and temporary.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Some potential habitat for this species would be lost as a result of the proposed action. It is proposed to survey within a 200m buffer of proposed infrastructure and implement management guidelines if the species located. With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to cause the species to decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	With the combination of habitat management and habitat offsetting, any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species would not be to an extent that is likely to interfere with the recovery of the species.

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Squatter Pigeon (southern subspecies) <i>Geophaps scripta scripta</i></b></p> <p>Squatter Pigeons are terrestrial, foraging and breeding on the ground and the southern subspecies occurs mainly in dry grassy eucalypt woodlands and open forests (Frith 1982; Crome and Shields 1992). It also inhabits <i>Callitris</i> and acacia woodlands and was reported from open plains in its historical southern range (Frith 1982). Most birds live in sandy sites near permanent water (Blakers <i>et al.</i> 1984). Squatter Pigeons dust-bathe and are often encountered on dirt tracks and in areas of bare soil denuded of ground cover by livestock (Frith 1982; Higgins and Davies 1996). Although they remain common in heavily grazed country in tropical Queensland (DEWHA 2009) they are typically more common in un-grazed land compared to grazed land (Woinarski and Ash 2002). Birds may occasionally feed in sown grasslands and pastures. Squatter Pigeons eat mainly seeds, including those of exotic pasture plants, and some insects (Crome and Shields 1992; Higgins and Davies 1996).</p> <p>There are three Queensland Museum database records, two from the 1800s and one from 1936. There are two Birds Australia records, one of which is from the surrounds of the study area. There is one BAAM survey record (2009) in the study area. The species is now very sparse in the region.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Some potential habitat for this species would be lost as a result of the proposed action.</p> <p>Mitigation is not recommended for this species due to its now marginal distribution within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.</p>
Reduce the area of occupancy of an <i>important population</i> .	There is a paucity of records from the study area and its surrounds and no important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	A paucity of records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.



Criteria	Assessment of Significance
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<b>Red Goshawk <i>Erythrotriorchis radiatus</i></b> The Red Goshawk occurs in woodlands and forests, ideally with a mosaic of vegetation types and permanent water, particularly riverine forests. The species avoids both very dense and very open habitats. The species is sparsely distributed, with home ranges of 120 km <sup>2</sup> and 200 km <sup>2</sup> for females and males, respectively (Marchant and Higgins 1993). There are two WildNet database records, 1978 and pre 1975 (McFarland <i>et al.</i> 1999). It is a very occasional visitor and is probably largely absent from the study area or may no longer occur. Known or potential use of the study area is summarised in <b>Appendix J</b> , while RE use within the relevant bioregional province is provided in <b>Table 2.12</b> . An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b> .
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Some potential habitat for this species would be lost as a result of the proposed action. Mitigation is not recommended for this species due to its marginal occurrence within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	There is a paucity of records from the study area and its surrounds and no important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	A paucity of records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.

Criteria	Assessment of Significance
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.

<p><b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b></p>	<p><b>Plains-wanderer <i>Pedionomus torquatus</i></b></p> <p>Plains-wanderers occur in open sparse native grasslands and do not occur in dense improved pasture or woodlands and other treed habitats even with a suitable ground layer. They are recorded from lightly grazed broad-acre agricultural areas with ephemeral and perennial grasses and herbs. Overgrazing, cultivation, pasture improvement and burning causes local extinctions (Marchant and Higgins 1993).</p> <p>There are four WildNet database records, all of unknown date and location. One pre-1975 record for study area (McFarland <i>et al.</i> 1999) is included in WildNet. The species is vagrant to the study area and any possible future occurrences are most likely in non-remnant vegetation.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>. No impacts are expected due to the clearing and construction, operation and decommissioning of the Project.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Mitigation is not recommended for this species due to its vagrant status within the study area and the absence of natural habitat. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	No important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	If this species is present, any population is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the</i>	A paucity of historical records indicates that there is no habitat present that is critical to the survival of the species.

Criteria	Assessment of Significance
<i>survival of a species.</i>	
Disrupt the breeding cycle of an <i>important population</i> .	A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<b>Australian Painted Snipe <i>Rostratula australis</i></b> The Australian Painted Snipe is a secretive, cryptic, crepuscular species that occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains. The species is patchily distributed throughout Australia, with most records being in the south-east. Records are erratic, the species being absent from areas in some years and common in others (Marchant and Higgins 1993). There is one WildNet database record, pre 1975 (McFarland <i>et al.</i> 1999) and one Birds Australia database record from the study area surrounds. It is reported annually from one property in the study area (Eddie 2008). Known or potential use of the study area is summarised in <b>Appendix J</b> , while RE use within the relevant bioregional province is provided in <b>Table 2.12</b> . An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b> . The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	
Reduce the area of occupancy of an <i>important population</i> .	No important population is known for the study area.



Criteria	Assessment of Significance
Fragment an existing <i>important population</i> into two or more populations.	No population of this highly mobile species will be fragmented due to the proposed action.
Adversely affect <i>habitat critical to the survival of a species</i> .	No habitat considered critical to the survival of the species is present in the study area.
Disrupt the breeding cycle of an <i>important population</i> .	No habitat considered critical to the breeding cycle of a population, whether or not that population is considered an important population, is present in the study area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased in availability or quality by the Project would result in decline of the species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Black-breasted Button-quail <i>Turnix melanogaster</i></b></p> <p>The species is predominantly recorded from closed dry rainforest and vine thickets with abundant leaf-litter, although they can also be occasionally recorded from scrubs including Brigalow, Belah, Bottletree thickets and in dry eucalypt forests where there is a dense understorey such as Lantana and grass groundcover. Their movements are not fully understood. They are often recorded intermittently or occasionally, before disappearing for extended periods (Marchant and Higgins 1993).</p> <p>There is one WildNet record, no location or date details available. Known to the north and east of study area (McFarland <i>et al.</i> 1999). Possibly occurs in Semi-evergreen Vine Thicket in the study area. However status in the study area not confirmed and it may not be present.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>

Criteria	Assessment of Significance
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Mitigation is not recommended for this species due to a lack of confirmation of its presence within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	No population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	The lack of records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	The lack of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased in availability or quality by the Project would result in decline of the species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.

**An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:**

**Grey-headed Flying-fox *Pteropus poliocephalus***

Two habitat characteristics are important for Grey-headed Flying-foxes - foraging resources and roosting sites (camps). As the species is a canopy-feeding frugivore and nectarivore, they utilise vegetation including rainforests, open eucalypt forests, woodlands, melaleuca swamps and banksia woodlands. Roosts are commonly within dense vegetation close to water, primarily rainforest patches, stands of melaleuca, mangroves or riparian vegetation (Nelson 1965), but colonies may use exotic vegetation in urban areas (Birt *et al.* 1998). The species congregates in large camps of up to 200,000 individuals from early until late summer, with the number of bats

Criteria	Assessment of Significance
	<p>within a camp being influenced by the availability of blossom in the surrounding area. Adults normally disperse during the winter and can migrate up to 750km as individuals or small groups, with the young forming winter camps (Churchill 2008).</p> <p>Regular or frequently used camps have been located between Rockhampton in Queensland south to around Mallacoota in East Gippsland, Victoria. Less consistent records extend the south range of the species to Warrnambool, Victoria (Duncan <i>et al.</i> 1999). They are generally recorded between the coast and the western slopes of the Great Dividing Range. Recent surveys have located camps of this species as far north as the Mackay region, with several records further south between Gladstone and Bundaberg, Queensland (Roberts <i>et al.</i> 2008). Despite one regular camp in Melbourne (Menkhorst 1995), the southern range of the species appears to have considerably retracted (Duncan <i>et al.</i> 1999).</p> <p>There is one WildNet record for the study area of unknown date and location (pre-1975). Known from the Taroom area (Craig Eddie pers. comm.) to the north and the Chinchilla area to the east (no details provided) (Hando and Hando 1997).</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8 in Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Mitigation is not recommended for this species due to a lack of confirmation of its presence within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	No population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	The lack of records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	The lack of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased in availability or quality by the Project would result in decline of the species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the



Criteria	Assessment of Significance
established in the vulnerable species' habitat.	guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>Large-eared Pied Bat <i>Chalinolobus dwyeri</i></b></p> <p>The Large-eared Pied Bat has been recorded roosting in disused mine tunnels, rock overhangs, caves and Fairy Martin <i>Petrochelidon ariel</i> nests (Dwyer 1966; Eyre <i>et al.</i> 1997; Schulz 1998; Thompson 2002). In south-eastern Queensland, the species seems to be more associated with higher altitude moist forests and adjacent rainforest (Eyre <i>et al.</i> 1997), while most records from New South Wales are from dry and wet sclerophyll forest including <i>Callitris</i> forests, tall open eucalypt forests with a dry understorey, sub-alpine woodland, and sandstone outcrop country (Duncan <i>et al.</i> 1999).</p> <p>There is one WildNet record (1997) in the study area. Roosting sites within the study area are most likely to be associated with Gurulmundi State Forest and surrounding areas.</p> <p>Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	<p>Some potential foraging habitat for this species would be lost as a result of the proposed action. It is recommended that a 200m buffer be maintained between any proposed actions and caves, tunnels and mines that may provide roosting habitat.</p> <p>Mitigation is not recommended for this species due to its marginal occurrence within the study area. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of an important population of the species.</p>
Reduce the area of occupancy of an <i>important population</i> .	There is a paucity of records from the study area and its surrounds and no important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	A paucity of records indicates that there is no habitat present that is critical to the survival of the species.

Criteria	Assessment of Significance
Disrupt the breeding cycle of an <i>important population</i> .	A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No habitat to be modified, destroyed, removed, isolated or decreased in availability or quality by the Project would result in decline of the species.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>	<p><b>South-eastern (Greater) Long-eared Bat (south-eastern form) <i>Nyctophilus corbeni</i> (formerly <i>timoriensis</i>)</b>  This species was formerly considered to be <i>Nyctophilus timoriensis</i> which is no longer considered to occur in Australia. It has very recently been described as <i>N. corbeni</i> (Parnaby 2009).  This species occurs in variety of dry forest habitats including River Red Gum <i>Eucalyptus camaldulensis</i>, open woodland, mallee, Brigalow <i>Acacia harpophylla</i> and other arid and semi-arid habitats. It appears to be more common in box, ironbark and <i>Callitris</i> forests on sandy soils on the western slopes of New South Wales and southern Queensland (Churchill 2008; Turbill <i>et al.</i> 2008).  It roosts in tree hollows or under bark (NPWS 2003). It is a little known species that is rarely caught (Churchill 2008) and resolution of Anabat call recordings to species level is not currently possible for the genus <i>Nyctophilus</i>. There are six WildNet database records, all from 2001 or 2002, from within the study area. There is also one Queensland Museum record and one recently published survey record (Unidel Energy and Infrastructure 2009).  Known or potential use of the study area is summarised in <b>Appendix J</b>, while RE use within the relevant bioregional province is provided in <b>Table 2.12</b>. An assessment of impacts due to clearing and construction, operation and decommissioning is provided in <b>Tables N5 to N8</b> in <b>Appendix N</b>.</p>
Lead to a long-term decrease in the size of an <i>important population</i> of a species.	Some potential habitat for this species would be lost as a result of the proposed action. The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would lead to the long-term decrease of

Criteria	Assessment of Significance
	an important population of the species.
Reduce the area of occupancy of an <i>important population</i> .	There is a paucity of records from the study area and its surrounds and no important population is known for the study area.
Fragment an existing <i>important population</i> into two or more populations.	Any population within the study area is unlikely to be of a sufficient size for fragmentation to occur.
Adversely affect <i>habitat critical to the survival of a species</i> .	A paucity of records indicates that there is no habitat present that is critical to the survival of the species.
Disrupt the breeding cycle of an <i>important population</i> .	A paucity of records indicates that there is no habitat present that is critical to the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The study area is not considered to contain habitat important enough for the species such that its modification, destruction, removal or isolation, or a decrease in its availability or quality would result in overall species decline.
Result in <i>invasive species</i> that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The application of feral animal management guidelines has been recommended for the clearing, construction, operation and decommissioning phases of this Project. The requirements for measures to be included within the guidelines as described in <b>Section 3.5.4</b> are considered sufficient to prevent negative impacts of invasive species as a result of the Project.
Introduce disease that may cause the species to decline.	The implementation of feral animal management guidelines within the Environmental Management Plan for the Project ( <b>Section 3.5.4</b> ) will assist in the prevention of the introduction of pest animals (and associated diseases) as a result of the Project. It is understood that a Biosecurity Management Plan will also be prepared for the Project which will include procedures for the prevention of disease introduction and spread.
Interfere with the recovery of the species.	Any modification, destruction, removal, isolation or decrease in availability or quality of habitat for this species in the study area would not be to an extent that is likely to interfere with the recovery of the species.

\* Does not include EPBC Act listed species obtained from the Online Protected Matters Search Tool and/or database searches but undetected in the study area during current and/or previous surveys and not expected to occur (as determined in **Appendix J**).



### EPBC Act Assessment of Impact Significance on Migratory Species in the study area\*

Criteria	Assessment of Significance
<b>An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:</b>	<ul style="list-style-type: none"> <li>• Australian Cotton Pygmy-goose <i>Nettapus coromandelianus albigennis</i>;</li> <li>• White-throated Needletail <i>Hirundapus caudacutus</i>;</li> <li>• Fork-tailed Swift <i>Apus pacificus</i>;</li> <li>• Great Egret <i>Ardea alba</i> (also known as Eastern Great Egret <i>A. modesta</i>);</li> <li>• Cattle Egret <i>Bubulcus ibis</i> (also known as <i>Ardea ibis</i>);</li> <li>• Glossy Ibis <i>Plegadis falcinellus</i>;</li> <li>• Osprey <i>Pandion haliaetus</i> (also known as Eastern Osprey <i>P. cristatus</i>)</li> <li>• White-bellied Sea-Eagle <i>Haliaeetus leucogaster</i>;</li> <li>• Pacific Golden Plover <i>Pluvialis fulva</i>;</li> <li>• Australian Painted Snipe <i>Rostratula australis</i> **;</li> <li>• Latham's Snipe <i>Gallinago hardwickii</i>;</li> <li>• Black-tailed Godwit <i>Limosa limosa</i>;</li> <li>• Bar-tailed Godwit <i>Limosa lapponica</i>;</li> <li>• Whimbrel <i>Numenius phaeopus</i>;</li> <li>• Common Greenshank <i>Tringa nebularia</i>;</li> <li>• Marsh Sandpiper <i>Tringa stagnatilis</i>;</li> <li>• Wood Sandpiper <i>Tringa glareola</i>;</li> <li>• Common Sandpiper <i>Actitis hypoleucos</i>;</li> <li>• Red-necked Stint <i>Calidris ruficollis</i>;</li> <li>• Sharp-tailed Sandpiper <i>Calidris acuminata</i>;</li> <li>• Curlew Sandpiper <i>Calidris ferruginea</i>;</li> <li>• Ruff <i>Philomachus pugnax</i>;</li> <li>• Caspian Tern <i>Sterna caspia</i> (also known as <i>Hydroprogne caspia</i>);</li> <li>• Rainbow Bee-eater <i>Merops ornatus</i>;</li> <li>• Black-faced Monarch <i>Monarcha melanopsis</i>;</li> <li>• Rufous Fantail <i>Rhipidura rufifrons</i>;</li> <li>• Satin Flycatcher <i>Myiagra cyanoleuca</i>; and</li> <li>• Australian Reed-Warbler <i>Acrocephalus australis</i> (formerly known as Clamorous Reed-Warbler <i>A. stentoreus</i>).</li> </ul>

Criteria	Assessment of Significance
<p>Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of <i>important habitat</i> for a migratory species.</p>	<p>There is little evidence to suggest that the study area supports 'important habitat' for migratory species. Given their migratory habits, the ephemeral nature of food and habitat resources, and the extent of habitat across their range, it is likely that the existing resources within the study area would be utilised infrequently and on a transitory basis only with the exception of a few species as discussed hereunder.</p> <p>Twenty of the species recorded for the study area (of a total of 28) are strongly associated with waterbodies, though White-bellied Sea-Eagle is considered a terrestrial rather than wetland species under the EPBC Act. Natural waterbodies are not a significant component of the study area, as indicated by the small number of records for most of these species. Most of the species are more likely to occur on the artificial waterbodies present or, in some cases, in temporary waterbodies, including flooded paddocks, created by heavy rain events. Osprey, Pacific Golden Plover, Black-tailed Godwit, Bar-tailed Godwit, Whimbrel, Wood Sandpiper, Red-necked Stint, Curlew Sandpiper, Ruff and Caspian Tern are all known from only one or two records from the study area and are not discussed hereunder. However, their habitat requirements are covered under the considerations of the remaining wetland species.</p> <p>Those wetland species for which specific potential impacts need to be considered are discussed individually, along with those migratory species that do not inhabit wetland areas.</p> <ul style="list-style-type: none"> <li> <b>Australian Cotton Pygmy-goose</b>                      Although this species is known in the study area from only one record it has been recorded more frequently in the general region and its habitat requirements would not be adequately dealt with in discussion of other species. Hence it is included here. The species occurs on terrestrial wetlands, preferring freshwater with abundant floating and submerged aquatic vegetation, interspersed with patches of open water (Marchant and Higgins 1990). It will use artificial waterbodies if they provide suitable resources. It is recommended that a 200m buffer be maintained between Project activities and any wetland community that may support this species. The proposed action would have minimal effects on any local population of this species and no important habitat will be modified, destroyed or isolated.                 </li> <li> <b>White-throated Needletail and Fork-tailed Swift</b>                      These non-breeding species have been recorded within the study area and are predicted to occur on an annual basis. Both are aerial species for which the study area does not represent 'important habitat' and no impacts are expected due to the proposed action as these species forage over a wide variety of land use, including human infrastructure and large waterbodies.                 </li> <li> <b>Great Egret and Cattle Egret</b>                      These species are known to occur in the study area with Great Egret being common and widespread in a variety of habitats and Cattle Egret being less common and associated with paddocks and livestock, but requiring wetlands for breeding. It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.                 </li> <li> <b>Glossy Ibis</b>                      This species is recorded only sparsely in the study area but could occur on any suitable waterbody. The species occurs on terrestrial wetlands, preferring inland freshwater wetlands with abundant aquatic flora (Pringle 1985; Marchant and Higgins 1990). It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. The proposed action would have minimal effects on any local population of these species and no important habitat will be                 </li> </ul>

Criteria	Assessment of Significance
	<p>modified, destroyed or isolated.</p> <ul style="list-style-type: none"> <li> <p><b>White-bellied Sea-Eagle</b></p> <p>This species could occur on any suitable waterbody in the study area. In addition to Narine habitats it occurs on terrestrial wetlands, including large rivers, freshwater swamps, lakes, reservoirs and billabongs (Marchant and Higgins 1993). It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.</p> </li> <li> <p><b>Australian Painted Snipe and Latham's Snipe</b></p> <p>These species are uncommon visitors to the study area but probably occur annually. The Australian Painted Snipe occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, saltmarsh, dams, rice crops, sewage farms and bore drains (Marchant and Higgins 1993). Latham's Snipe has similar habitat use, occurring in swamp and marsh margins and in wet pasture (Pringle 1987). It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. Some pasture subject to inundation may be modified by the Project but such habitat is not considered an 'important habitat' for the two species. The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.</p> </li> <li> <p><b>Common Greenshank, Marsh Sandpiper and Sharp-tailed Sandpiper</b></p> <p>These species are occasional visitors to the study area. They occur on a variety of wetlands, including freshwater wetlands (Geering <i>et al.</i> 2007) and in the case of Sharp-tailed Sandpiper, in flooded paddocks (Higgins and Davies 1996). It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. Some pasture subject to inundation may be modified by the Project but such habitat is not considered an 'important habitat'. The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.</p> </li> <li> <p><b>Rainbow Bee-eater</b></p> <p>Rainbow Bee-eater is a common, widespread species in the study area. It occurs in open or lightly timbered areas, shrublands, farmland, cleared land, mangroves, rainforest edges and in disturbed areas that have exposed soil or sand banks for breeding (Higgins 1999). The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.</p> </li> <li> <p><b>Black-faced Monarch, Rufous Fantail and Satin Flycatcher</b></p> <p>These three species are occasional or very occasional visitors to the study area. Within the study area they would occur in the more moist habitats, including closed forests and along watercourses and gullies. Semi-evergreen Vine Thicket is the habitat most likely to provide suitable resources for Black-faced Monarch and Rufous Fantail and it is recommended that no SEVT be lost in the study area as a result of the proposed action. The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.</p> </li> <li> <p><b>Australian Reed-Warbler</b></p> <p>The Australian Reed-Warbler is uncommon in the study area, probably due to a lack of suitable fringing vegetation around waterbodies. It occurs in reeds, rushes, sedges and similar vegetation in and adjacent to Nost wetland types (Higgins <i>et al.</i> 2006). It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community</p> </li> </ul>

Criteria	Assessment of Significance
	The proposed action would have minimal effects on any local population of these species and no important habitat will be modified, destroyed or isolated.
Result in invasive species that are harmful to the migratory species becoming established in an area of <i>important habitat</i> for the migratory species.	<p>As noted above, the study area is not considered to be an area of 'important habitat' for migratory birds, whether they are wetland or terrestrial species. The local area has a history of forest clearing and habitat modification, which has benefited a number of feral and invasive flora and fauna species. The proponent proposes the implementation of weed and feral animal control programs for the Project in accordance with any local and/or State government pest or Weed Management Plans that will contribute to the overall enhancement of habitat for migratory species.</p>
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an <i>ecologically significant proportion of the population</i> of a migratory species.	<p>There is no evidence to suggest that the study area supports an 'ecologically significant proportion of a population' of any of the migratory birds known or considered likely to occur.</p> <p>The creation of additional dams as part of the Project could result in a net increase in available habitat for many of these species. Those wetland species for which specific potential impacts need to be considered are discussed below, along with those migratory species that do not inhabit wetland areas.</p> <ul style="list-style-type: none"> <li> <p><b>Australian Cotton Pygmy-Goose</b></p> <p>The species occurs on terrestrial wetlands and breeds from late spring to Nid autumn, nesting high in hollow trees near water (Marchant and Higgins 1990). Although known from only one record there is potential for breeding by this species within the study area. It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community that may support this species. This buffer means that the proposed action would have minimal effects on this species and that there would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> <li> <p><b>White-throated Needletail and Fork-tailed Swift</b></p> <p>No impacts are expected for these non-breeding aerial species (they do not breed in Australia) as a result of the proposed action regardless of whether or not the study area is considered to support an 'ecologically significant proportion of a population'.</p> </li> <li> <p><b>Great Egret and Cattle Egret</b></p> <p>It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. This buffer means that the proposed action would have minimal effects on these species and that there would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> <li> <p><b>White-bellied Sea-Eagle</b></p> <p>It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. This buffer means that the proposed action would have minimal effects on these species and that there would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> <li> <p><b>Australian Painted Snipe and Latham's Snipe</b></p> <p>Latham's Snipe breeds in the northern hemisphere but it is possible that Australian painted Snipe breeds in the study area. It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. Some</p> </li> </ul>



Criteria	Assessment of Significance
	<p>pasture subject to inundation may be modified by the Project but such habitat is not considered an 'important habitat' for the two species. The buffer means that the proposed action would have minimal effects on these species and that there would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> <ul style="list-style-type: none"> <li> <p><b>Common Greenshank, Marsh Sandpiper and Sharp-tailed Sandpiper</b></p> <p>These species are occasional visitors to the study area that breed in the northern hemisphere. It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. Some pasture subject to inundation may be modified by the Project but such habitat is not considered an 'important habitat'. There would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> <li> <p><b>Rainbow Bee-eater</b></p> <p>Rainbow Bee-eater is a common, widespread species and the study area would not support an 'ecologically significant proportion of a population' and any potential impacts associated with the proposed action would be negligible.</p> </li> <li> <p><b>Black-faced Monarch, Rufous Fantail and Satin Flycatcher</b></p> <p>In the study area the habitat most important to Black-faced Monarch and Rufous Fantail is Semi-evergreen Vine Thicket and it is recommended that no SEVT be lost in the study area as a result of the proposed action. Satin Flycatcher is most likely in moist gullies. There would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> <li> <p><b>Australian Reed-Warbler</b></p> <p>The Australian Reed-Warbler occurs in reeds, rushes, sedges and similar vegetation in and adjacent to Nost wetland types. It is recommended that a 200m buffer be maintained between Project activities and any mapped wetland community. There would be no serious disruption to the lifecycle of any local population, regardless of whether or not the population is considered to be an ecological significant proportion of the species' population.</p> </li> </ul>

\* Does not include EPBC Act listed species obtained from the Online Protected Matters Search Tool and/or database searches but undetected in the study area during current and/or previous surveys and not expected to occur (as determined in **Appendix J**).

\*\* Painted Snipes in Australia have previously been considered a migratory subspecies of *Rostratula benghalensis* (Marchant and Higgins 1993). Most recently, the Australian birds have been considered to be an endemic species, *R. australis*, in which case *R. benghalensis* does not occur in Australia (Garnett and Crowley 2000; Geering *et al.* 2007). However, despite *R. australis* being recognised under Matters of National Environmental Importance as a Vulnerable species, the species remains as *R. benghalensis s lat.* in regards to listing as a migratory species.

## REFERENCES

**Australian Network for Plant Conservation (2004).** *Guidelines for the Translocation of Plants*. Second Edition. Prion, Canberra.

**Birt, P, Markus, N, Collins, L and Hall, L (1998).** 'Urban flying-foxes.' *Nature Australia*, **26**: 54-59.

**Blakers, M, Davies, SJJ F and Reilly, PN (1984).** *The atlas of Australian birds*. Melbourne University Press, Melbourne.

**Churchill, S (2008).** *Australian bats*. Second Edition. Allen & Unwin, Crows Nest.

**Cogger, HG (2000).** *Reptiles and amphibians of Australia*. Reed New Holland, Sydney.

**Cogger, HG, Cameron, EE, Sadler, RA and Eggler, P (1993).** *The action plan for Australian reptiles*. Australian Nature Conservation Agency, Canberra.

**Crome, F and Shields, J (1992).** *Parrots and pigeons of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, Pymble.

**DEWHA (2009).** 'Species Profile and Threats Database: *Geophaps scripta scripta* – Squatter Pigeon (southern)'.  
[http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\\_id+64440](http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id+64440)

**DEWR (2007).** 'Draft Policy Statement: Use of Environmental Offsets Under the *Environment Protection and Biodiversity Conservation Act 1999*'. Department of Environment and Water Resources, Canberra.

**Drury, W (2001).** *Reptiles under threat in Queensland's Southern*

*Brigalow Belt*. World Wide Fund for Nature, Brisbane.

**Duncan, A, Barker, GB and Montgomery, N (1999).** *The action plan for Australian bats*. Environment Australia, Canberra.

**Dwyer, PD (1966).** 'Observations on *Chalinolobus dwyeri* (Chiroptera: Vespertilionidae) in Australia.' *Journal of Mammalogy*, **47**: 716-718.

**Eddie, C (2007).** *Field guide to trees and shrubs of eastern Queensland oil and gas fields*. Santos Ltd, Adelaide.

**Eddie, C (2008).** 'Fauna and flora of 'Rockwood', Talinga Development Area, southern inland Queensland: historical summary.' Report to Origin Energy and Golder Associates, BOOBOOK Wildlife Consulting, Roma.

**Ehmann, H (1992).** *Encyclopedia of Australian animals: Reptiles*. Angus and Robertson, Sydney.

**Eyre, T, Barrett, D and Venz, M (1997).** 'Systematic vertebrate fauna survey project, stage 1 – vertebrate fauna survey in the SEQ bioregion.' Department of Natural Resources, Brisbane.

**Frith, HJ (1982).** *Pigeons and doves of Australia*. Rigby, Adelaide.

**Geering, A, Agnew, L and Harding, S (2007).** *Shorebirds of Australia*. CSIRO Publishing, Collingwood.

**Hando, R and Hando, V (1997).** *Going bush with Chinchilla Nats*. Second Edition. Chinchilla Field Naturalist's Club Inc., Chinchilla.

**Higgins, PJ (ed.) (1999).** *Handbook of Australian, New Zealand and Antarctic birds*, Volume 4, *Parrots to dollarbird*. Oxford University Press, Melbourne.

**Higgins, PJ and Davies, SJJF (eds.) (1996).** *Handbook of Australian,*



<p>New Zealand &amp; Antarctic birds, Volume 3, Snipe to pigeons. Oxford University Press, Melbourne.</p>	<p>north west slopes of New South Wales. NSW Parks and Wildlife Service, Coffs Harbour.</p>
<p><b>Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006).</b> <i>Handbook of Australian, New Zealand &amp; Antarctic Birds</i> Volume 7, <i>Boatbills to starlings, Part B, Dunnock to starlings</i>. Oxford University Press, Melbourne.</p>	<p><b>Parnaby, HE (2009).</b> 'A taxonomic review of Australian greater long-eared bats previously known as <i>Nyctophilus timoriensis</i> (Chiroptera: Vespertilionidae) and some associated taxa.' <i>Australian Zoologist</i>, <b>35</b>: 39-81.</p>
<p><b>Hines, BM, Hannah D, Venz, M and Eyre, T (2000).</b> 'New distribution and habitat data for the vulnerable pygopodid, <i>Delma torquata</i> (Kluge 1974).' <i>Memoirs of the Queensland Museum</i>, <b>45</b>: 391-393.</p>	<p><b>Pringle, JD (1985).</b> <i>The waterbirds of Australia: the National Photographic Index of Australian Wildlife</i>. Angus and Robertson, North Ryde.</p>
<p><b>Kutt, AS, Hannah, DS and Thurgate, NY (2003).</b> 'Distribution, habitat and conservation status of <i>Paradelma orientalis</i> Gunther 1876 (Lacertilia: Pygopodidae).' <i>Australian Zoologist</i>, <b>32</b>: 61-264.</p>	<p><b>Pringle, JD (1987).</b> <i>The shorebirds of Australia: the National Photographic Index of Australian Wildlife</i>. Angus and Robertson, North Ryde.</p>
<p><b>Marchant, S and Higgins, PJ (eds.) (1990).</b> <i>Handbook of Australian, New Zealand &amp; Antarctic Birds</i>, Volume 1, <i>Ratites to ducks, Part B Australian pelican to ducks</i>. Oxford University Press, Melbourne.</p>	<p><b>Roberts, BJ, Catterall, CP, Kanowski, J and Eby, P (2008).</b> A re-evaluation of the northern distributional limit of the grey-headed flying-fox, <i>Pteropus poliocephalus</i>. <i>Australian Bat Society News</i>.</p>
<p><b>Marchant, S and Higgins, PJ (eds.) (1993).</b> <i>Handbook of Australian, New Zealand and Antarctic birds</i>, Volume 2, <i>Raptors to lapwings</i>. Oxford University Press, Melbourne.</p>	<p><b>Schulz, M (1998).</b> 'Bats and other fauna in disused fairy martin <i>Hirundo arial</i> nests.' <i>Emu</i>, <b>98</b>:184-191.</p>
<p><b>McFarland, D, Venz, M and Reis, T (1999).</b> 'Priority species summaries. An attachment to the report: Terrestrial vertebrate fauna of the Brigalow Belt South Bioregion: Assessment and analysis for conservation planning.' Queensland Environmental Protection Agency, Brisbane.</p>	<p><b>Schulz, M and Eyre, TJ (1997).</b> 'New distribution and habitat data for the pygopodid, <i>Paradelma orientalis</i> (Gunther 1876).' <i>Memoirs of the Queensland Museum</i>, <b>42</b>: 12.</p>
<p><b>Menkhorst, PW (ed.) (1995).</b> <i>Mammals of Victoria: Distribution, ecology and conservation</i>. Oxford University Press, Melbourne.</p>	<p><b>Shea, GM (1987).</b> 'Notes on the biology of <i>Paradelma orientalis</i>.' <i>Herpetofauna</i>, <b>17</b>: 5-6.</p>
<p><b>Nelson, JE (1965).</b> 'Movements of Australian flying foxes (Pteropodidae: Megachiroptera).' <i>Australian Journal of Zoology</i>, <b>13</b>: 53-73.</p>	<p><b>Stanisic, J, Shea, M, Potter, D and Griffiths, O (in preparation).</b> <i>Australian land snails: Volume 1. A field guide to eastern Australian species</i>. Publisher unknown, Singapore.</p>
<p><b>NPWS (2003).</b> <i>Threatened species of the New England Tablelands and</i></p>	<p><b>Thompson, B (2002).</b> <i>Australian handbook for the conservation of bats in mines and artificial cave-bat habitats</i>. Australian Centre for Mining Environmental Research, Brisbane.</p>

<b>Tremul, PR (2000).</b> 'Breeding, feeding and arboreality in <i>Paradelma orientalis</i> : A poorly known, vulnerable pygopodid from Queensland, Australia.' <i>Memoirs of the Queensland Museum</i> , <b>45</b> : 599-609.	Report prepared for Queensland Curtis LNG.
<b>Turbill, C, Lumsden, LF and Ford, GI (2008).</b> 'South-eastern and Tasmanian Long-eared Bats' In: S Van Dyck and R Strahan (eds.), <i>The mammals of Australia</i> . 3 <sup>rd</sup> edn. Reed New Holland, Sydney. pp. 527-528.	<b>Wilson, S (2005).</b> <i>A field guide to reptiles of Queensland</i> . Reed New Holland, Sydney.
<b>Unidel Energy and Infrastructure, (2009).</b> 'Queensland Curtis LNG Project (upstream component) draft flora and fauna assessment.'	<b>Wilson, S and Swan, G (2008).</b> <i>A complete guide to reptiles of Australia</i> . Reed New Holland, Sydney.
	<b>Woinarski, JCZ and Ash, AJ (2002).</b> 'Responses of vertebrates to pastoralism, military land use and landscape position in an Australian tropical savanna.' <i>Austral Ecology</i> , <b>27</b> : 311-323.

## **Appendix Q: Bibliography**

- Abensperg-Traun, M, Smith, GT, Steven, DE and Atkins, L (2000).** 'Different woodland types, different grazing effects? Plants and soil and litter arthropods in remnant woodlands in the Western Australian wheatbelt.' In: RJ Hobbs and CJ Yates (eds.), *Temperate eucalypt woodlands in Australia. Biology, Conservation, Management and Restoration*. Surrey Beatty & Sons, Chipping Norton. pp. 225-234.
- Adair, RJ and Groves, RH (1998).** 'Impact of environmental weeds on biodiversity: a review and development of a methodology.' Biodiversity Group, Environment Australia, Canberra.
- Alexiou, PN (1983).** 'Effect of feral pigs (*Sus scrofa*) on subalpine vegetation at Smokers Gap, Australian Capital Territory.' *Proceedings of the Ecological Society of Australia*, **12**: 135–142.
- Allen, LR, Merrell, PW and Mitchell, JL (1984).** 'The effects of exotic fauna in the Brigalow Belt and the strategies which can be adopted to minimize the problem.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 193-204.
- Altieri, MA (1999).** 'The ecological role of biodiversity in agroecosystems.' *Agriculture, Ecosystems and Environment*, **74**: 19-31.
- Altieri, MA (2002).** 'Agroecology: the science of natural resource management for poor farmers in marginal environments.' *Agriculture, Ecosystems and Environment*, **93**: 1-24.
- Anderson, ER (1984).** 'The native woody weed problem following Brigalow development in Australia.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 183-192.
- Anderson, E (2003).** *Plants of Central Queensland: their identification and uses*. Department of Primary Industries, Brisbane.
- Andreasen, JK, O'Neill, RV, Noss, R and Slosser, NC (2001).** 'Considerations for the development of a terrestrial index of ecological integrity.' *Ecological Indicators*, **1**: 21-35.
- Andren, H (1994).** 'Effects of habitat fragmentation on birds and mammals in landscapes with different proportions of suitable habitat: a review.' *Oikos*, **71**: 355-366.
- Andrews, A (1990).** 'Fragmentation of habitat by roads and utility corridors: a review.' *Australian Zoologist*, **26**: 130-140.
- Anstis, M (2002).** *Tadpoles of south-eastern Australia: A guide with keys*. Reed New Holland, Sydney.
- Arnold, GW, Maller, RA and Lichfield, R (1987).** 'Comparison of bird populations in remnants of Wandoo woodland and adjacent farmland.' *Australian Wildlife Research* **14**: 331-41.
- Augee, ML, Carrick, FN, Grant, TR and Temple-Smith, PD (2008).** 'Order Monotremata Platypus and Echidnas.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 30-31.
- Australian Biological Resources Study (ABRS), (2009).** *Grevillea singuliflora*. <http://www.anbg.gov.au/abrs>.
- Australian Network for Plant Conservation (2004).** *Guidelines for the Translocation of Plants 2<sup>nd</sup> Ed*. Prion, Canberra.
- Bailey, A (1984).** *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane.
- Barker, J, Grigg, GC and Tyler, MJ (1995).** *A field guide to Australian frogs*. Surrey Beatty & Sons, Chipping Norton.
- Barker, RD and Vestjens, WJM (1989).** *The food of Australian birds, volume 1, Non-passerines*. CSIRO Division of Wildlife and Ecology, Canberra.
- Barrett, GW, Ford, HA and Recher, HF (1994).** 'Conservation of woodland birds in a

- fragmented rural landscape.' *Pacific Conservation Biology*, **1**: 245-256.
- Barrett, G, Silcocks, A, Barry, S, Cunningham, R and Poulter, R (2003).** *The new atlas of Australian birds*. Royal Australasian Ornithologists Union: Hawthorn East.
- Barson, MM, Randall, LA and Bordas, V (2000).** 'Land cover change in Australia. Results of the collaborative Bureau of Rural Sciences - State agencies' project on remote sensing of agricultural land cover change.' Bureau of Rural Sciences, Canberra.
- Bastin, GN, Ludwig, JA, Eager, RW, Chewings, VH and Liedloff, AC (2002).** 'Indicators of landscape function: comparing patchiness metrics using remotely-sensed data from rangelands.' *Ecological Indicators*, **1**: 247-260.
- Baudry, J, Burel, FC, Thenail, C and Le Coeur, D (2000).** 'A holistic landscape ecological study of the interactions between farming activities and ecological patterns in Brittany, France.' *Landscape and Urban Planning*, **50**: 119-128.
- Bayley, CP (1978).** 'A comparison of the diets of the red fox and feral cat in an arid environment.' *South Australian Naturalist*, **53**: 20-28.
- Beadle, NCW (1948).** 'The vegetation and pasture of western New South Wales with special reference to soil erosion.' Department of Conservation of New South Wales, Sydney.
- Bedward, M, Sivertsen, DP, Metcalfe, LM, Cox, SJ and Simpson, CS (2001).** 'Monitoring the rate of woody vegetation change in the New South Wales wheatbelt.' Final Project Report to the Natural Heritage Trust/Environment Australia. New South Wales Parks and Wildlife Service, Sydney.
- Bender, DJ and Fahrig, L (2005).** 'Matrix structure obscures the relationship between interpatch movement and patch size and isolation.' *Ecology*, **86**: 1023-1033.
- Bender, DJ, Contreras, TA and Fahrig, L (1998).** 'Habitat loss and population decline: a meta-analysis of the patch size effect.' *Ecology*, **79**: 517-533.
- Bengtsson, J, Angelstam, P, Elmqvist, T, Emanuelsson, U, Folke, C, Ihse, M, Moberg, F and Nystrom, M (2003).** 'Reserves, resilience and dynamic landscapes.' *Ambio*, **10**: 191-199.
- Bennett, AF (1991).** 'Roads, roadsides and wildlife conservation: a review.' In: DA Saunders and RJ Hobbs (eds.), *Nature conservation 2: the role of corridors*. Surrey Beatty and Sons, Chipping Norton. pp 99-118.
- Bennett, AF and Ford, LA (1997).** 'Landscape use, habitat change and the conservation of birds in fragmented rural environments: a landscape perspective from the Northern Plains, Victoria, Australia.' *Pacific Conservation Biology*, **3**: 244-261.
- Bennett, A, Kimber, S and Ryan, P (2000).** 'Revegetation and wildlife: A guide to enhancing revegetated habitats for wildlife conservation in rural environments.' Environment Australia, Canberra.
- Bennett, AF and MacNally, R (2004).** 'Identifying priority areas for conservation action in agricultural landscapes.' *Pacific Conservation Biology*, **10**: 106-123.
- Bentley, JM and Catterall, CP (1997).** 'The use of bushland, corridors, and linear remnants by birds in southeastern Queensland, Australia' *Conservation Biology*, **11**: 1173-1189.
- Beruldsen, G (2006).** 'Breeding behaviour and status of cotton pygmy-goose *Nettapus coromandelianus* in south-east Queensland.' *Sunbird*, **36**: 1-21.
- Biggs, AJW, Silburn, DM, Power, RE, Gordon, IJ and Cresswell, RG (2008).** 'Secondary salinity status and assessment in Queensland, Australia.' In 2nd International Salinity Forum Salinity, Water and Society – Global issues, local action: *New approaches for tackling the salinisation of water resources. Includes irrigation, dryland and*



- urban salinity, and salt water intrusion. Adelaide Convention Centre Adelaide, South Australia, Australia 31 March – 3 April 2008. pp 1-4.
- Bird, PR, Bicknell, D, Bulman, PA, Burke, SJA, Leys, JF, Parker, JN, van der Sommen, GJ and Voller, P (1992).** 'The role of shelter in Australia for protecting soils, plants and livestock.' *Agroforestry Systems*, **20**: 59-86.
- Birds Australia (2009).** 'New atlas database.' Birds Australia, Melbourne. Accessed 16 July 2009.
- Blakers, M, Davies, SJJ F and Reilly, PN (1984).** *The atlas of Australian birds*. Melbourne University Press, Melbourne.
- Bloomer, JP and Bester, MN (1992).** 'Control of feral cats on sub-Antarctic Marion Island, Indian Ocean.' *Biological Conservation*, **60**: 221-219.
- Boland, CRJ (2004).** 'Introduced cane toads are active nest predators and competitors of rainbow bee-eaters *Merops ornatus*: observational and experimental evidence.' *Biological Conservation*, **120**: 53-62.
- Boles, WE (1988).** *The robins & flycatchers of Australia: the National Photographic Index of Australian Wildlife*. Angus & Robertson Publishers, Sydney.
- Bond, EM and Chase, JM (2002).** 'Biodiversity and ecosystem functioning at local and regional spatial scales.' *Ecology Letters*, **5**: 467-470.
- Boulter, SL, Wilson, BA, Westrup, J, Anderson, ER, Turner, EJ and Scanlan, JC (2000).** 'Native vegetation management in Queensland. Background, science and values.' Indooroopilly, Queensland: Queensland Department of Natural Resources.
- Bowen, KD, Spencer, RJ and Janzen, FJ (2005).** 'A comparative study of environmental factors that affect nesting in Australian and North American freshwater turtles.' *Journal of Zoology*, **267**: 397-404.
- Bowen, ME, McAlpine, CA, House, APN and Smith, GC (2007).** 'Regrowth forests on abandoned agricultural land: A review of their habitat values for recovering forest fauna.' *Biological Conservation*, **140**: 273-296.
- Bowen, ME, McAlpine, CA, House, APN and Smith, GC (2009).** 'Agricultural landscape modification increases the abundance of an important food resource: Mistletoes, birds and brigalow.' *Biological Conservation*, **142**: 122-133.
- Bowen, ME, McAlpine, CA, Seabrook, LM, House, APN and Smith, GC (2009).** 'The age and amount of regrowth forest in fragmented brigalow landscapes are both important for woodland dependent birds.' *Biological Conservation*, **142**: 3051-3059.
- Braby, MF (2000).** *The butterflies of Australia: their identification, biology and distribution*. CSIRO Publishing, Collingwood.
- Braby, MF (2004).** *The complete field guide to butterflies of Australia*. CSIRO Publishing, Collingwood.
- Bradstock, RA, Williams, JE and Gill, AM (2002).** *Flammable Australia: The Fire Regimes and Biodiversity of a Continent*. Cambridge University Press, Cambridge, UK.
- Breitfuss, MJ and Hill, CJ (2003).** 'Field observations on the life history and behaviour of *Jalmenus evagoras eubulus* Miskin (Lepidoptera: Lycaenidae) in the Southern Brigalow Belt of Queensland.' *Australian Entomologist*, **30**: 135-138.
- Briese DT (1993).** The contribution of plant biology and ecology to the biological control of weeds. *Proceedings of the 10th Australian and 14th Asian-Pacific Weed Conference*, **1**: 10-18.
- Briggs, JD and Leigh, JH (1996).** *Rare or threatened Australian plants - revised edition*. Collingwood, CSIRO Publishing.



- Briggs, SV and Thornton, SA (1999).** 'Management of water regimes in river red gum *Eucalyptus camaldulensis* wetlands for waterbird breeding.' *Australian Zoologist*, **31**: 187-197.
- Briggs, SV, Thornton, SA and Lawler, WG (1997).** 'Relationships between hydrological control of river red gum wetlands and waterbird breeding.' *Emu*, **97**: 31-42.
- Broadbent, K (1885).** 'The birds of the Chinchilla District.' *Proceedings of the Royal Society of Queensland*, **2**: 117-126.
- Brooker MIH and Kleinig, DA (1994).** *Field guide to eucalypts: northern Australia*. Inkata Press, Sydney.
- Brotons, L, Wolff, A, Paulus, G and Martin J-L (2005).** 'Effect of adjacent agricultural habitat on the distribution of passerines in natural grasslands.' *Biological Conservation*, **124**: 407-414.
- Brown, GP, Phillips, BL, Webb, JK and Shine, R (2006).** 'Toad on the road: Use of roads as dispersal corridors by cane toads (*Bufo marinus*) at an invasion front in tropical Australia.' *Biological Conservation*, **133**: 88-94.
- Brown, GW (2001).** 'The influence of habitat disturbance on reptiles in a box-ironbark eucalypt forest of south-eastern Australia.' *Biodiversity and Conservation*, **10**: 161-176.
- Brown, MM, Topfer, K, Wolfensohn, JD and Lash, J (2000).** *World resources 2000-2001 – people and ecosystems: the fraying of web of life*. World Resources Institute, Washington DC.
- Brown, S and Lugo, AE (1990).** 'Tropical secondary forests.' *Journal of Tropical Ecology*, **6**: 1-32.
- Burnett, S (1997).** 'Colonizing cane toads cause population declines in native predators: reliable anecdotal information and management implications.' *Pacific Conservation Biology*, **3**: 65-72.
- Butler, DW (2007).** 'Recovery plan for the "Brigalow (*Acacia harpophylla* dominant and co-dominant)" endangered ecological community (draft of 1 May 2007).' Report to the Department of the Environment and Water Resources, Canberra. Queensland National Parks and Wildlife Service, Brisbane.
- Butler, DW and Fairfax, RJ (2003).** 'Buffel grass and fire in a gidgee and brigalow woodland: a case study from central Queensland.' *Ecological Management & Restoration*, **4**: 120-125.
- Calaby, JH (1969).** 'Australian mammals since 1770.' *Australian Natural History*, **16**: 271-275.
- Cameron, AC (1976).** 'Nesting of the square-tailed kite.' *Sunbird*, **7**: 42-48.
- Cameron, CAC (1992).** 'Further notes on square-tailed kites nesting in south-east Queensland'. *Sunbird*, **22**: 30-31.
- Cameron, M (2005).** 'Group size and feeding rates of glossy black-cockatoos in central New South Wales.' *Emu*, **105**: 299-304.
- Cann, J (1998).** *Australian freshwater turtles*. Beaumont Publishing, Singapore.
- Cardillo, M and Bromham, L (2001).** 'Body size and risk of extinction in Australian mammals.' *Conservation Biology*, **15**: 1435-1440.
- Carrick, FN, Grant, TR and Temple-Smith, PD (2008).** 'Platypus.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 32-35.
- Carroll, C, Merton, L and Burger, P (2000).** 'Impact of vegetative cover and slope on runoff, erosion, and water quality for field plots on a range of soil and spoil materials on central Queensland coal mines.' *Australian Journal of Soil Research*, **38**: 313-328.
- Carroll, C, Noss, RE, Paquet, PC and Schumaker, NH (2004).** 'Extinction debt of protected areas in developing landscapes.' *Conservation Biology*, **18**: 1110-1120.

- Catling, PC (1988).** 'Similarities and contrasts in the diets of foxes, *Vulpes vulpes*, and cats, *Felis catus*, relative to fluctuating prey populations and drought.' *Australian Wildlife Research*, **15**: 307-317.
- Catling, PC, Hertog, A, Burt, RJ, Wombey, JC and Forrester, RI (1999).** 'The short-term effect of cane toads (*Bufo marinus*) on native fauna in the Gulf Country of the Northern Territory.' *Wildlife Research*, **26**: 161-185.
- Catterall, CP, Green, RJ and Jones, DN (1991).** 'Habitat use by birds across a forest-suburb interface in Brisbane: implications for corridors.' In Saunders, DA and Hobbs, RJ (eds.) *Nature conservation 2: the role of corridors*. Surrey Beatty, Chipping Norton.
- Catterall, CP and Kingston, M (1993).** *Remnant bushland of southeast Queensland in the 1990s: its distribution, loss, ecological consequences and future prospects*. Institute of Applied Environmental Research, Griffith University and Brisbane City Council, Brisbane.
- Catterall, CP, Kanowski, J, Wardell-Johnson GW, Proctor, H, Reis, T, Harrison, D and Tucker, NIJ (2004).** 'Quantifying the biodiversity values of reforestation: perspectives, design issues and outcomes in Australian rainforest landscapes.' In: D Lunney (ed.) *Conservation of Australia's forest fauna (second edition)*. Royal Zoological Society of New South Wales, Mosmann. pp. 359-393.
- Chambers, J (2008).** 'Terrestrial habitat requirements of a suite of anuran species inhabiting a semi-arid region of south east Queensland.' PhD thesis, Queensland University of Technology, Gardens Point, Brisbane.
- Chambers, LE, Hughes, L and Weston, MA (2005).** 'Climate change and its impact on Australia's avifauna.' *Emu*, **105**: 1-20.
- Chazdon, RL (2003).** 'Tropical forest recovery: legacies of human impact and natural disturbances.' *Perspectives in Plant Ecology, Evolution and Systematics*, **6**: 51-71.
- Chenoweth EPLA (2003).** 'Ecological corridors and edge effects project.' Prepared for Brisbane City Council, Brisbane.
- Choquenot, D, Kilgour, RJ and Lukins, BS (1993).** 'An evaluation of feral pig trapping.' *Wildlife Research*, **20**: 15-22.
- Churchill, S (1998).** *Australian bats*. Reed New Holland, Sydney.
- Churchill, S (2008).** *Australian bats*. Second edition. Allen & Unwin, Crows Nest.
- Clarke, PJ, Latz, PK and Albrecht, DE (2005).** 'Long-term changes in semi-arid vegetation: invasion of an exotic perennial grass has larger effects than rainfall variability.' *Journal of Vegetation Science*, **16**: 237-248.
- Clarke, PJ, Latz, PK and Albrecht, DE (2005).** 'Long-term changes in semi-arid vegetation: Invasion of an exotic perennial grass has larger effects than rainfall variability.' *Journal of Vegetation Science*, **16**: 237-248.
- Clout, M (1989).** 'Foraging behaviour of glossy black-cockatoos.' *Australian Wildlife Research*, **16**: 467-473.
- Coaldrake, JE (1970).** 'The brigalow.' In RM Moore (ed.) *Australian grasslands*. Australian National University Press, Canberra. pp. 123-140.
- Cogger, HG (2000).** *Reptiles and amphibians of Australia*. Reed New Holland, Sydney.
- Cogger, HG, Cameron, EE, Sadler, RA and Egger, P (1993).** *The action plan for Australian reptiles*. Australian Nature Conservation Agency, Canberra.
- Cogger, H, Ford, H, Johnson, C, Holman, J and Butler, D (2003).** 'Impacts of land clearing on Australian wildlife in Queensland.' WWF, Brisbane.
- Collard, SJ (2007).** 'Agricultural intensification and ecosystem function in a brigalow (*Acacia harpophylla*) landscape: implications for

- ecosystem services.' PhD Thesis, University of Southern Queensland.
- Collard, S, Le Brocque, A and Zammit, C (2009).** 'Bird assemblages in fragmented agricultural landscapes: the role of small brigalow remnants and adjoining land uses.' *Biodiversity and Conservation*, **18**: 1649-1670.
- Collard, SJ and Zammit, C (2006).** 'Effects of land use intensification on soil carbon and ecosystem services in the Brigalow (*Acacia harpophylla*) landscapes of southeast Queensland, Australia.' *Agriculture, Ecosystems and Environment*, **117**: 185–194.
- Collins, JP and Storfer, A (2003).** 'Global amphibian declines: sorting the hypotheses.' *Diversity and Distribution*, **9**: 89-98.
- Combella JH (1987).** Weeds in cropping—their cost to the Australian economy. *Invited Editorial Plant Protection Quarterly*, **2**: 2, and various updates.
- Cooke, BD (1987).** 'The effects of rabbit grazing on regeneration of she-oaks, *Allocasuarina verticillata* and saltwater ti-trees, *Melaleuca halmaturorum*, in the Coorong National Park, South Australia.' *Australian Journal of Ecology*, **13**: 11-20.
- Corbett, LK (2008).** 'Dingo' In: S Van Dyck and R Strahan (eds.), *The Mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 737-739.
- Covacevich, JA, and Couper, PJ (1996).** '*Aspidites ramsayi* (Boidae) in the brigalow biogeographical region of Queensland: occurrence, conservation status, and possible bilby associations.' *Memoirs of the Queensland Museum*, **39**: 243-246.
- Covacevich, JA, Couper, PJ and McDonald, KR (1998).** 'Reptile diversity at risk in the Brigalow Belt, Queensland.' *Memoirs of the Queensland Museum*, **42**: 475-486.
- Covacevich, J, Dunmall, W and Sorley, J (1988).** 'Reptiles.' In: G Scott (ed.), *Lake Broadwater: The natural history of an inland Lake and its environs*. Darling Downs Institute Press, Toowoomba. pp. 265-273.
- Cowie, BA, Thornton, CM and Radford, BJ (2007).** 'The Brigalow Catchment Study: I. Overview of a 40-year study of the effects of land clearing.' *Australian Journal of Soil Research*,
- Cramer, VA and Hobbs, RJ (2002).** 'Ecological consequences of altered hydrological regimes in fragmented ecosystems in southern Australia: Impacts and possible management responses.' *Austral Ecology*, **27**: 546–564.
- CRC for Australian Weed Management (2003).** 'Athel pine or tamarisk (*Tamarix aphylla*).' Weed Management Guide, Natural Heritage Trust.  
<http://www.weeds.gov.au/publications/guidelines/wons/pubs/t-aphylla.pdf>
- Crome, F and Shields, J (1992).** *Parrots and pigeons of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, Pymble.
- Crossland, MR (2000).** 'Direct and indirect effects of the introduced toad *Bufo marinus* (Anura: Bufonidae) on populations of native anuran larvae in Australia.' *Ecography*, **23**: 283-290.
- Crossland MR and Alford RA (1998).** Evaluation of the toxicity of eggs, hatchlings and tadpoles of the introduced toad *Bufo marinus* (Anura: Bufonidae) to native Australian aquatic predators. *Australian Journal of Ecology* **23**: 129-137.
- Crossman, D (1984).** 'Native pest fauna of the Brigalow Belt of Australia.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 205-210.
- Crowley, GM and Garnett, ST (2001).** 'Food value and tree selection by glossy black-cockatoos *Calyptorhynchus lathami*.' *Austral Ecology*, **26**: 116-126.

- Cullen JM and Delfosse ES (1990).** Progress and prospects in biological control of weeds. *Proceedings of the 9th Australian Weeds Conference, Adelaide, August 1990.*
- Cunningham, RB, Lindenmayer, DB, Crane, M, Michael, D, MacGregor, C, Montague-Drake, R and Fischer, J (2008).** 'Scattered trees are keystone structures – implications for conservation.' *Conservation Biology*, **22**: 742-752.
- Daily, GC (ed.) (1997).** *Nature's services: societal dependence on natural ecosystems.* Island Press, Washington DC.
- Dauber, J and Wolters, V (2004).** 'Edge effects on ant community structure and species richness in an agricultural landscape.' *Biodiversity and Conservation*, **13**: 901–915.
- Dawson, TJ and Ellis, BA (1979).** 'Comparison of the diets of yellow-footed rock-wallabies and sympatric herbivores in western New South Wales.' *Australian Wildlife Research*, **6**: 245-254.
- Debus, S (1998).** *The birds of prey of Australia: A field guide.* Oxford University Press, Melbourne.
- Debus, SJS and Chafer, CJ (1994).** 'The powerful owl *Ninox strenua* in New South Wales.' *Australian Birds*, **28**: S20-S38.
- Debus, SJS and Czechura, GV (1988).** 'The red goshawk *Erythrotriorchis radiatus*: A review.' *Australian Bird Watcher*, **12**: 175-199.
- Debus, SJS and Czechura, GV (1989).** 'The square-tailed kite *Lophoictinia isura*: A review.' *Australian Bird Watcher*, **13**: 81-97..
- Debus, SJS and Rose, AB (1994).** 'The masked owl *Tyto novaehollandiae* in New South Wales.' *Australian Birds*, **28**: S39-S64.
- Debuse, VJ, House, APN, Taylor, DW, and Swift, SA (2009).** 'Landscape structure influences tree density patterns in fragmented woodlands in semi-arid eastern Australia.' *Austral Ecology*, **34**: 621-635.
- Deer, R (1996).** 'Reptile diversity in a *Callitris* forest in central Queensland's Brigalow Belt.' *Memoirs of the Queensland Museum*, **39**: 390.
- DEH (2006).** 'EPBC Act Policy Statement 1.1: Significant Impact Guidelines, Matters of National Environmental Significance'. Department of Environment and Heritage, Canberra.
- DERM (2009).** 'Regional Ecosystem Mapping.' Version 5.0, Queensland Herbarium, Queensland Department of Environment and Resource Management, Brisbane.
- DERM (2009).** 'Regional Ecosystem Mapping.' Version 6.0, Queensland Herbarium, Queensland Department of Environment and Resource Management, Brisbane.
- DERM (2009).** 'Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregions.' Queensland Department of Environment and Resource Management, Brisbane.
- DERM (2009).** 'WildNet Database.' Queensland Department of Environment and Resource Management, Brisbane. Accessed via Wildlife Online, 14 August 2009. [http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife\\_online/](http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online/)
- DERM (2009).** 'WildNet Database.' Queensland Department of Environment and Resource Management, Brisbane. Species locality records accessed via DERM staff, 14 July 2009 and 11 August 2009.
- DEWHA (2009).** 'Australian Faunal Directory.' Department of the Environment, Water, Heritage and the Arts, Canberra. <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/>
- DEWHA (2008)** 'Brigalow belt south - bioregion .' Department of Environment, Water, Heritage and the Arts, Canberra.



<http://www.environment.gov.au/land/publications/acris/pubs/bioregion-brigalow-belt-south.pdf>

**DEWHA (2009).** 'EPBC Act Online Protected Matters Search Tool.' Commonwealth Department of Environment, Water, Heritage and the Arts, Canberra. Accessed 5 November 2009.  
<http://www.environment.gov.au/erin/ert/epbc/index.html>

**DEWHA (2009).** 'EPBC Act Online Protected Matters Search Tool.' Commonwealth Department of Environment, Water, Heritage and the Arts, Canberra. Accessed 25 September 2009.  
<http://www.environment.gov.au/erin/ert/epbc/index.html>

**DEWHA (2009).** 'Species Profile and Threats Database.' Department of the Environment, Water, Heritage and the Arts, Canberra.  
<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

**DEWR (2007).** 'Draft Policy Statement: Use of Environmental Offsets Under the *Environment Protection and Biodiversity Conservation Act 1999*'. Department of Environment and Water Resources, Canberra.

**DEWR (2007).** 'Use of Environmental Offsets Under the *Environment Protection and Biodiversity Conservation Act 1999* (Discussion Paper)'. Department of Environment and Water Resources, Canberra.

**Dennis, AJ and Johnson, PM (2008).** 'Rufous Bettong.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 285-286.

**Dickman, CR (1996).** 'Impact of exotic generalist predators on the native fauna of Australia.' *Wildlife Biology*, **2**: 185-195.

**Dickman, C (1996).** 'Overview of the impacts of feral cats on Australian native fauna.'

Australian Nature Conservation Agency, Canberra.

**Dickman, CR., Leung, LKP and Van Dyck, SM (2000).** 'Status, ecological attributes and conservation of native rodents in Queensland.' *Wildlife Research*, **27**: 333-346.

**Dickman, CR, Pressey, CL, Lim, L Parnaby, HE (1993).** 'Mammals of particular conservation concern in the Western Division of New South Wales.' *Biological Conservation*, **65**: 219-248.

**Dickman, CR and Stodart, E (2008).** 'Long-nosed Bandicoot.' In: S Van Dyck and R Strahan (eds.), *The Mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 189-190.

**Dique, DS, Preece, HJ, Thompson, J and de Villiers, DL (2004).** 'Determining the distribution and abundance of a regional koala population in south-east Queensland for conservation management.' *Wildlife Research*, **31**: 109-117.

**DNR (1999).** 'Species management profiles: Flora and fauna information system 2: *Grevillea singuliflora*.' Department of Natural Resources, Brisbane.

**DNR (2001).** 'Forest condition assessment and implications for biodiversity.' Forest Ecosystem Research and Assessment, Queensland Department of Natural Resources, Brisbane.

**Doherty, M (1998).** 'The conservation value of regrowth native plant communities: a review.' Report prepared for the New South Wales Scientific Committee, CSIRO, Canberra.

**Doherty, M, Kearns, A, Barnett, G, Sarre, A, Hochuli, D, Gibb, H and Dickman, C (2000).** 'The interaction between habitat conditions, ecosystem processes and terrestrial biodiversity – a review.' Australia: state of the environment second technical paper series (biodiversity). Department of the Environment and Heritage, Canberra.

**Dorfman, EJ, Lamont, A and Dickman, CR (2001).** 'Foraging behaviour and success of

- black-necked storks (*Ephippiorhynchus asiaticus*) in Australia: implications for management.' *Emu*, **101**: 145-149.
- Dorricott, K, Lawrie, B and Voller, P (1997).** 'Balancing productivity and conservation in southern inland Queensland: a case study at the grass-roots.' In: P Hale and D Lamb (eds.), *Conservation outside nature reserves*. Centre for Conservation Biology, University of Queensland, Brisbane. pp. 233-240.
- Dorrough, J, Yen, A, Turner, V, Clark, SG, Crosswaite, J and Hirth, JR (2004).** 'Livestock grazing management and biodiversity conservation in Australian temperate grassy landscapes.' *Australian Journal of Agricultural Research*, **55**: 279-295.
- Downey, PO and Smith, JMB (2000).** 'Demography of the invasive shrub Scotch broom (*Cytisus scoparius*) at Barrington Tops, New South Wales: insights for management.' *Austral Ecology*, **25**: 477-485.
- Drury, W (2001).** 'Reptiles under threat in Queensland's Southern Brigalow Belt.' World Wide Fund for Nature, Brisbane.
- Duelli, P (1997).** 'Biodiversity evaluation in agricultural landscapes: an approach at two different scales.' *Agriculture, Ecosystems and Environment*, **62**: 81-91.
- Duelli, P and Obrist, MK (2003).** 'Biodiversity indicators: the choice of values and measures.' *Agriculture, Ecosystems and Environment*, **62**: 81-91.
- Duggin, JA, Gentle, CB, (1998).** Experimental evidence on the importance of disturbance intensity for invasion of *Lantana camara* L. in dry rainforest-open forest ecotones in north-eastern NSW, Australia. *Forest Ecology and Management*, **109**: 279-292.
- Duncan, A, Barker, GB and Montgomery, N (1999).** *The action plan for Australian bats*. Environment Australia, Canberra.
- Dwyer, PD (1966).** 'Observations on *Chalinolobus dwyeri* (Chiroptera: Vespertilionidae) in Australia.' *Journal of Mammalogy*, **47**: 716-718.
- Eastwood, R, Braby, MF, Schmidt, DJ and Hughes, JM (2008).** 'Taxonomy, ecology, genetics and conservation status of the pale imperial hairstreak (*Jalmenus eubulus*) (Lepidoptera: Lycaenidae): a threatened butterfly from the Brigalow Belt, Australia.' *Invertebrate Systematics*, **22**: 407-423.
- Eddie, C (1998).** 'Terrestrial fauna.' In: M Eddie (ed.) *Ranges to Rivers: an overview of natural resources in the Maranoa-Balonne catchment*. MBCMA, Roma. pp. 19-21 + Appendices 3-6.
- Eddie, C (2001).** 'Overview of vertebrate fauna of the Maranoa-Balonne Catchment.' In: *Proceedings of the Queensland Murray-Darling Basin Condition & Trend Forum*. Roma, November 8-9, 2000. pp.15-22.
- Eddie, C (2007).** *Field guide to trees and shrubs of eastern Queensland oil and gas fields*. Santos Ltd, Adelaide.
- Eddie, C (2008).** 'Fauna and flora of 'Rockwood', Talinga Development Area, southern inland Queensland: historical summary.' Report to Origin Energy and Golder Associates, BOOBOOK Wildlife Consulting, Roma.
- Eddie, C and Hall, T (1998).** 'Vegetation.' In: M Eddie (ed.). *Ranges to rivers: an overview of natural resources in the Maranoa-Balonne catchment*. Maranoa-Balonne Catchment Management Association, Roma. pp. 14-17.
- Edwards, GP, De Preu, N, Shakeshaft, BJ and Crealy, IV (2000).** 'An evaluation of two methods of assessing feral cat and dingo abundance in central Australia.' *Wildlife Research*, **27**: 143-149.
- Ehmann, H (1992).** *Encyclopedia of Australian animals: Reptiles*. Angus and Robertson, Sydney.



- Environment Australia (2001).** *A Directory of Important Wetlands in Australia*. Third Edition. Australian Government, Canberra.
- EPA (2002).** 'Biodiversity Planning Assessment: Brigalow Belt South Fauna Expert Panel Report.' Environmental Protection Agency, Brisbane.
- EPA (2002).** 'Biodiversity Assessment and Mapping Methodology.' Environmental Protection Agency Biodiversity Planning Unit, Biodiversity Branch Version 2.1, July 2002. Brisbane.
- EPA (2003).** 'BPA BRB South Fauna Expert Panel in Brigalow Belt South Biodiversity Planning Assessment.' Environmental Protection Agency, Brisbane.
- EPA (2005).** 'Queensland Herbarium, Regional Ecosystem Description Database, Version 5.0.' Environmental Protection Agency, Brisbane.
- EPA (2007).** 'Regional Ecosystem Description Database (REDD).' Version 5.2. Queensland Herbarium, Environmental Protection Agency, Brisbane. Updated November 2007.
- EPA (2008).** 'Brigalow Belt South Landscape Expert Panel Report.' Environmental Protection Agency, Brisbane. August 2002. Revised and updated June 2008.
- EPA (2008).** 'Brigalow Belt South Flora Expert Panel Report.' Environmental Protection Agency, Brisbane. October 2002. Revised and updated June 2008.
- EPA (2008).** 'Brigalow Belt South Fauna Expert Panel Report.' Environmental Protection Agency, Brisbane. Revised and updated June 2008.
- EPA (2008).** 'Environmental Offsets Policy.' Environmental Protection Agency, Brisbane.
- EPA (2008).** 'Policy for Biodiversity Offsets (Consultation Draft).' Environmental Protection Agency, Brisbane.
- EPA (2008).** 'Table 01 – Regional Ecosystems by Subregion.' Unpublished data of pre-clear extent and remnant extent up to 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane.
- Exelby, A and Melzer, A (eds.) (2001).** *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone.
- Eyre, T, Barrett, D and Venz, M (1997).** 'Systematic vertebrate fauna survey project, stage 1 – vertebrate fauna survey in the SEQ bioregion.' Department of Natural Resources, Brisbane.
- Eyre, TJ, Jermyn, D and Kelly, AL (2000).** 'Forest Condition and Habitat Assessment in Queensland.' Forest Ecosystem Research and Assessment Standards for Forest Assessment Technical Report 02/00. Department of Natural Resources, Brisbane
- Eyre, TJ, Maron, M, Mathieson, MT and Haseler, M (2009).** 'Impacts of grazing, selective logging and hyper-aggressors on diurnal bird fauna in intact forest landscapes of the Brigalow Belt, Queensland.' *Austral Ecology*, **34**: 705-716.
- Fahrig, L (2001).** 'How much habitat is enough?' *Biological Conservation*, **100**: 65-74.
- Fahrig, L (2002).** 'Effect of habitat fragmentation on the extinction threshold: a synthesis.' *Ecological Applications*, **12**: 346-353.
- Fahrig, L (2003).** 'Effects of habitat fragmentation on biodiversity.' *Annual Review of Ecology, Evolution and Systematics*, **34**: 487-515.
- Fahrig, L, Pedlar JH, Pope SE, Taylor, PD and Wegner, JF (1995).** Effect of road traffic on amphibian density. *Biological Conservation*, **73**: 177-182.
- Fairfax, RJ and Fensham, RJ (2000).** 'The effect of exotic pasture development on floristic diversity in central Queensland, Australia.' *Biological Conservation*, **94**: 11-21.

- Faith, DP (2002).** 'Quantifying biodiversity: a phylogenetic perspective.' *Conservation Biology* **16**: 248–252.
- Fensham, R, Butler, D and Fairfax, R (2001).** 'The buffel grass dilemma for fire sensitive vegetation in Queensland's conservation reserves.' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 46–47.
- Fensham, RJ and Fairfax, RJ (2003).** 'A land management history for central Queensland, Australia as determined from land-holder questionnaire and aerial photography.' *Journal of Environmental Management*, **68**: 409–420.
- Fensham, RJ and Fairfax, RJ (2003).** 'Assessing woody vegetation cover change in north-west Australian savanna using aerial photography.' *International Journal of Wildland Fire*, **12**: 359–367.
- Fensham, RJ and Fairfax, RJ (2005).** 'Preliminary assessment of gidgee (*Acacia cambagei*) woodland thickening in the Longreach district, Queensland.' *The Rangeland Journal*, **27**: 159–168.
- Fensham RJ, Fairfax, RJ and Archer, SR (2005).** 'Rainfall, land use and woody vegetation cover change in semi-arid Australian savanna.' *Journal of Ecology*, **93**: 596–606.
- Fensham, RJ, Low Choyb, SJ, Fairfax, RJ and Cavallarob, PC (2003).** 'Modelling trends in woody vegetation structure in semi-arid Australia as determined from aerial photography.' *Journal of Environmental Management*, **68**: 421–436.
- Fensham, RJ, McCosker, JC and Cox, MJ (1998).** 'Estimating clearance of *Acacia*-dominated ecosystems in central Queensland using land-system mapping data.' *Australian Journal of Botany*, **46**: 305–319.
- FERA (2001).** 'Forest Condition Assessment and Implications for Biodiversity. Final Report.' Forest Ecosystem Research and Assessment, Queensland Department of Natural Resources, Brisbane.
- Ferrier, S (2002).** 'Mapping spatial pattern in biodiversity for regional conservation planning: Where to from here?' *Systems Biology*, **51**: 331–363.
- Fischer, J and Lindenmayer, DB (2002).** 'Small patches can be valuable for biodiversity conservation: two cases studies on birds in southeastern Australia.' *Biological Conservation*, **106**: 129–136.
- Fischer, J and Lindenmayer, DB (2002).** 'The conservation value of paddock trees for birds in a variegated landscape in southern New South Wales. 2. Paddock trees as stepping stones.' *Biodiversity and Conservation*, **11**: 833–849.
- Fischer, J, Lindenmayer, DB and Cowling, A (2004).** 'The challenge of managing multiple species at multiple scales: reptiles in an Australian grazing landscape.' *Journal of Applied Ecology*, **41**: 32–44.
- Fischer, J, Lindenmayer, DB and Manning AD (2006).** 'Biodiversity, ecosystem function and resilience: ten guiding principles for commodity production landscapes.' *Frontiers in Ecology and Environment*, **4**: 80–86.
- Fischer, J, Manning, AD, Steffen, W, Rose, DB, Daniell, K, Felton, A, Stephen, G, Gilna, B, Heinsohn, R, Lindenmayer, DB, MacDonald, B, Mills, F, Newell, B, Reid, J, Robin, L, Sherren, K and Wade, A (2007).** 'Mind the sustainability gap.' *Trends in Ecology and Evolution*, **22**: 621–624.
- Fleishman, E, Ray, C, Sjögren-Gulve, P, Boggs, CI, and Murphy, DD (2002).** 'Assessing the roles of patch quality, area and isolation in predicting metapopulation dynamics.' *Conservation Biology*, **16**: 706–716.
- Fonseca, CR and Ganade, G (2001).** 'Species functional redundancy, random extinctions

- and the stability of ecosystems.' *Journal of Ecology*, **89**: 118–125.
- Ford, F (2008)**. 'Eastern Pebble-mouse.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 648-650.
- Ford, HA, Barrett, GW, Saunders, DA and Recher, HF (2001)**. 'Why have birds in the woodlands of southern Australia declined?' *Biological Conservation*, **97**: 71-88.
- Ford, GI, Pennay, M, Young, RA and Richards, GC (2008)**. 'Little Pied Bat.' In S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland: Sydney. pp. 539-540.
- Ford, HA, Walters, JR, Cooper, CB, Debus, SJS and Doerr, VAJ (2009)**. 'Extinction debt or habitat change? – Ongoing losses of woodland birds in north-eastern New South Wales, Australia.' *Biological Conservation*, **142**: 3182-3190.
- Forman, RTT and Godrun, M (1995)**. *Land mosaics: the ecology of landscapes and regions*. Cambridge University Press, Cambridge.
- Fossett, GW and Venamore, PC (1993)**. 'Evaluation of animal productivity and pasture yield after treatment of brigalow (*Acacia harpophylla*) regrowth with tebuthiuron.' In *Proceedings of the XVII International Grassland Congress*, 8-21 February 1993, Palmerston North, New Zealand. New Zealand Grassland Association and Tropical Grassland Society of Australia.
- Foster, DR, Motzkin, G and Slater, B (1998)**. 'Land-use history as long-term Broad-scale disturbance: regional forest dynamics in central New England.' *Ecosystems*, **1**: 96-119.
- Fox, BJ, Taylor, JE, Fox, MD and Williams, C (1997)**. 'Vegetation changes across edges of rainforest remnants.' *Biological Conservation*, **82**: 1-13.
- Fox, MD and Fox, BJ (1986)**. 'The susceptibility of natural communities to invasion.' In: RH Groves and JJ Burdon (eds.), *Ecology of biological invasions*. Cambridge University Press, Cambridge, UK. pp 57–66.
- Franks, A, Butler D and Fairfax, R. (2000)**. 'A weed by any other name', *Wildlife Australia. Autumn 2000*: 24.
- Freudenberger, D (1999)**. 'Guidelines for enhancing grassy woodlands for the Vegetation Investment Project.' CSIRO Wildlife & Ecology, Canberra.
- Freudenberger, D (2001)**. 'Bush for the birds: Biodiversity enhancement for the Saltshaker Project, Boorowa, NSW.' CSIRO Sustainable Ecosystems, Canberra.
- Freudenberger, D and Harvey, J (2003)**. 'Assessing the benefits of vegetation enhancement for biodiversity: A draft framework.' CSIRO Sustainable Ecosystems, Canberra.
- Frith, HJ (1982)**. *Pigeons and doves of Australia*. Rigby, Adelaide.
- Gannon, GR (1962)**. 'Distribution of the Australian honeyeaters.' *Emu*, **62**: 145-166.
- Garnett, S (ed.) (1993)**. *Threatened and extinct birds of Australia*. Royal Australasian Ornithologists Union/ Australian National Parks and Wildlife Service, Canberra.
- Garnett, ST and Crowley, GM (2000)**. *The action plan for Australian birds*. Environment Australia, Canberra.
- Gasteen, WJ (1987)**. 'The brigalow lands of eastern Australia: agricultural impact and landuse potential versus biological representation and stability.' In: GI Werren and AP Kershaw (eds.), *The rainforest legacy: Australian National Rainforests study: Volume 1—The nature, distribution and status of rainforest types*. Australian Government Publishing Service, Canberra. pp. 95-118.

- Geering, A, Agnew, L and Harding, S (2007).** *Shorebirds of Australia*. CSIRO Publishing, Collingwood.
- Gibbons, P and Lindenmayer, D (2002).** *Tree hollows and wildlife conservation in Australia*. CSIRO Publishing, Collingwood.
- Gibbons, P, Lindenmayer, DB, Fischer, J, Manning, AD, Weinberg, A, Seddon, J, Ryan, P and Barrett, G (2008).** 'The future of scattered trees in agricultural landscapes.' *Conservation Biology*, **22**: 1309-1319.
- Gibbons, JW, Scott, DE, Ryan, TJ, Buhlmann, KA, Tuberville, TD, Metts, BS, Greene, JL, Mills, T, Leiden, Y, Poppy, S and Winne, CT (2000).** 'The global decline of reptiles, déjà vu amphibians.' *Bioscience*, **50**: 653-666.
- Gill, AM (1999).** 'Biodiversity and bushfires: An Australia-wide perspective on plant-species changes after a fire event.' In: AM Gill, JCZ Woinarski and A York (eds.), *Australia's biodiversity-response to fire: Plants, birds and invertebrates*. Biodiversity Technical Paper No. 1, Department of Environment and Heritage, Commonwealth of Australia.
- Gill, AM and Bradstock RA (1992).** 'A national register for the fire responses of plant species.' *Cunninghamia*, **2**: 653–660.
- Gill, AM, Woinarski, JCZ and York, A (2009).** 'Australia's Biodiversity – Responses to Fire: Plants, birds and invertebrates.' *Biodiversity Technical Paper, No. 1*, Department of the Environment and Heritage, Commonwealth of Australia.
- Gilmore, S, Mackey, B and Berry, S (2007).** 'The extent of dispersive movement behaviour in Australian vertebrate animals, possible causes, and some implications for conservation.' *Pacific Conservation Biology*, **13**: 93-103.
- Glanznig, A (1995).** 'Native vegetation clearance, habitat loss and biodiversity decline: An overview of recent native vegetation clearance in Australia and its implications for biodiversity.' *Biodiversity Series, Paper No. 6*, Biodiversity Unit, Department of the Environment, Sport and Territories.
- Glen, AS and Dickman, CR (2003).** 'Effects of bait-station design on the uptake of baits by non-target animals during control programmes for foxes and wild dogs.' *Wildlife Research*, **30**: 147-149.
- Glen, AS and Dickman, CR (2003).** 'Monitoring bait removal in vertebrate pest control: a comparison using track identification and remote photography.' *Wildlife Research*, **30**: 29-33.
- Glen, AS, Dickman, CR, Soulé and Mackey, BG (2007).** 'Evaluating the role of the dingo as a trophic regulator in Australian ecosystems.' *Austral Ecology*, **32**: 492-501.
- Golder Associates Pty Ltd (2008).** 'Report on ecological survey. Talinga Development Project Area within Petroleum Lease (PL) 226.' Chinchilla, Queensland. Report prepared for Origin Energy.
- Goldingay, RL (2008).** 'Yellow-bellied Glider.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 228-230.
- Goldingay, RL and Whelan, RJ (1997).** 'Powerline easements: do they promote edge effects in eucalypt forest for small mammals?' *Wildlife Research*, **24**: 737-744.
- Gordon, G (1984).** 'Fauna of the Brigalow Belt.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 61-70.
- Gordon, G (2008).** 'Northern Brown Bandicoot.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 178-180.
- Gotelli, NJ and Colwell, RK (2001).** 'Quantifying biodiversity: procedures and pitfalls in the measurement and comparison of species richness.' *Ecology Letters*, **4**: 379–391.



- Grant, T (1995).** *The platypus: a unique mammal*. University of New South Wales Press, Sydney.
- Grant, TR and Temple-Smith, PD (2003).** 'Conservation of the platypus, *Ornithorhynchus anatinus*: Threats and challenges.' *Aquatic Ecosystem Health & Management*, **6**: 5-18.
- Green, RJ and Catterall, CP (1998).** 'The effects of forest clearing and regeneration on the fauna of Wivenhoe Park, south-east Queensland.' *Wildlife Research*, **25**: 677-690.
- Grey, MJ, Clarke, MF and Loyn, RH (1997).** 'Initial changes in the avian communities of remnant eucalypt woodlands following a reduction in the abundance of noisy miners, *Manorina melanocephala*.' *Wildlife Research*, **24**: 631-648.
- Grey, MJ, Clarke, MF and Loyn, RH (1998).** 'Influence of the noisy miner *Manorina melanocephala* on avian diversity and abundance in remnant grey box woodland.' *Pacific Conservation Biology*, **4**: 55-69.
- Grice, AC (2004).** 'Weeds and the monitoring of biodiversity in Australian rangelands.' *Austral Ecology*, **29**: 51-58.
- Griffin, AS, Evans, CS and Blumstein, DT (2001).** 'Learning specificity in acquired predator recognition.' *Animal Behaviour*, **62**: 577-589.
- Gunn, RH (1984).** 'Soil landscapes of the Brigalow Belt in Queensland.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 7-21.
- Gustafson, EJ and Gardner, RH (1996)** 'The effect of landscape heterogeneity on the probability of patch colonization.' *Ecology*, **77**: 94-107.
- Hagman, M and Shine, R (2009).** 'Factors influencing responses to alarm pheromone by larvae of invasive cane toads, *Bufo marinus*.' *Journal of Chemical Ecology*, **35**: 265-271.
- Hall, LS and Richards, GC (1979).** *Bats of eastern Australia, Queensland Museum Booklet No. 12*. Queensland Museum, Brisbane.
- Hamilton, AJ (2005).** 'Species diversity or biodiversity?' *Journal of Environmental Management*, **75**: 89-92.
- Hancock, CN, Ladd, PG and Froend, RH (1996).** 'Biodiversity and management of riparian vegetation in Western Australia.' *Forest Ecology and Management*, **85**: 239-250.
- Hando, V (undated).** *Wildflowers of southeast inland Queensland*. Chinchilla Field Naturalist's Club, Chinchilla.
- Hando, R and Hando, V (1997).** *Going bush with Chinchilla Nats*. Second Edition. Chinchilla Field Naturalist's Club Inc., Chinchilla.
- Hannah, DS and Smith GC (1995).** 'Effects of prescribed burning on herptiles in southeastern Queensland.' *Memoirs of the Queensland Museum*, **38**: 529-531.
- Hannah D and Thurgate, N (2001).** 'Lands of strips and patches.' *Wildlife Australia, autumn 2001*: 38-39.
- Hannah, D, Woinarski, JCZ, Catterall, CP, McCosker, JC, Thurgate, NY and Fensham, RJ (2007).** 'Impacts of clearing, fragmentation and disturbance on the bird fauna of eucalypt savanna woodlands in central Queensland, Australia.' *Austral Ecology*, **32**: 261-276.
- Harris, G (2002).** 'Simple rules underlie the complex and non-linear dynamics of terrestrial and aquatic ecosystems: Implications for catchment biogeochemistry and modelling.' Technical Report 11/02, CSIRO Land and Water, Canberra.
- Hazell, D, Osborne, E and Lindenmayer D (2003).** 'Impact of post-European stream change on frog habitat: southeastern Australia.' *Biodiversity and Conservation*, **12**: 301-320.
- Hector, A, Dobson, K, Minns, A, Bazeley-White, E and Lawton, JH (2001).** 'Community

- diversity and invasion resistance: An experimental test in a grassland ecosystem and a review of comparable studies.' *Ecological Research*, **16**: 819–831.
- Heise-Pavlov, PM (2008).** 'Pig.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 755-757.
- Henzell, R (2008).** 'Goat.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 768-769.
- Hero, JM, Morrison, C, Gillespie, G, Roberts, JD, Newell, D, Meyer, E, McDonald, K, Lemckert, F, Mahony, M, Osborne, W, Hines, H, Richards, S, Hoskin, C, Clarke, J, Doak, N and Shoo, L (2006).** 'Overview of the conservation status of Australian frogs.' *Pacific Conservation Biology*, **12**: 313-320.
- Higgins, PJ (ed.) (1999).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 4: Parrots to dollarbird*. Oxford University Press, Melbourne.
- Higgins, PJ and Davies, SJ (eds.) (1996).** *Handbook of Australian, New Zealand & Antarctic birds, Volume 3, Snipe to pigeons*. Oxford University Press, Melbourne.
- Higgins, PJ and Peter, JM (eds.) (2002).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 6: Pardalotes to shrike-thrushes*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 7, Boatbills to starlings, Part A, boatbill to larks*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006).** *Handbook of Australian, New Zealand & Antarctic Birds Volume 7, Boatbills to starlings, Part B, dunnoek to starlings*. Oxford University Press, Melbourne.
- Higgins, PJ, Peter, JM and Steele, WK (eds.) (2001).** *Handbook of Australian, New Zealand & Antarctic Birds. Volume 5: Tyrant-flycatchers to chats*. Oxford University Press, Melbourne.
- Hines, BM, Hannah D, Venz, M and Eyre, T (2000).** 'New distribution and habitat data for the vulnerable pygopodid, *Delma torquata* (Kluge 1974).' *Memoirs of the Queensland Museum*, **45**: 391-393.
- Hines, HB and the South-east Queensland Threatened Frogs Recovery Team (2002).** 'Recovery plan for stream frogs of south-east Queensland 2001-2005: report to Environment Australia, Canberra.' Queensland Parks and Wildlife Service, Brisbane
- Hinsley, SA, Bellamy, PE, Enoksson, B, Fry, G, Gabrielsen, L, McCollin, D and Schotman, A (1998).** 'Geographical and land-use influences on bird species richness in small woods in agricultural landscapes.' *Global Ecology and Biogeography*, **7**: 125-135.
- Hobbs, RJ (1993).** 'Can revegetation assist in the conservation of biodiversity in agricultural areas?' *Pacific Conservation Biology*, **1**: 29-38.
- Hobbs, RJ (1993).** 'Effects of landscape fragmentation on ecosystem processes in the Western Australian wheatbelt.' *Biological Conservation* **64**: 193–201.
- Hobbs, RJ (2001).** 'Synergisms among habitat fragmentation, livestock grazing, and biotic invasions in southwestern Australia.' *Conservation Biology*, **15**: 1522-1528.
- Hollands, D (1984).** *Eagles hawks and falcons of Australia*. Thomas Nelson Australia, Melbourne.
- Hollands, D (1991).** *Birds of the night: owls, frogmouths and nightjars of Australia*. Reed Books, Balgowlah.
- Hollands, D (2008).** *Owls, frogmouths and nightjars of Australia*. Blooming Books, Melbourne.



- Holling, CS (1973).** 'Resilience and stability of ecological systems.' *Annual Review of Ecology and Systematics*, **4**: 1-23.
- Hone, J (1995).** 'Spatial and temporal aspects of vertebrate pest damage with emphasis on feral pigs.' *Journal of Applied Ecology*, **32**: 311-319.
- Hooper, DU, Chaplin, FS, Ewel, JJ, Hector, AD, Inchausti, P, Lavorel, S, Lawton, JH, Lodge, DM, Loreau, M, Naeem, S, Schmid, B, Setälä, H, Symstad, AJ, Vandermeer, IJ and Wardlen, DA (2005).** 'Effects of biodiversity on ecosystem functioning: a consensus of current knowledge.' *Ecological Monographs*, **75**: 3-35.
- Houston, W and Melzer, A (2001).** 'Importance of range woodlands for conservation and biodiversity using the brigalow scaly-foot and the common rock-rat as examples.' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 92-96.
- Howe, RW (1984).** 'Local dynamics of bird assemblages in small forest habitat islands in Australia and North America.' *Ecology*, **65**: 1585-1601.
- Howe, RW (1986).** 'Bird distributions in forest islands in north-eastern New South Wales.' In HA Ford and DC Paton (Eds.), *The dynamic partnership: birds and plants in southern Australia*. D.J.Woolman, Adelaide. pp. 119-129.
- Hoye, GA and Hall, LS (2008).** 'Eastern Bent-winged Bat.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 507-508.
- Hoye, GA and Hall, LS (2008).** 'Little Bent-winged Bat.' In S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 503-504.
- Hoye, GA and Schulz, M (2008).** 'Large-eared Pied Bat.' In S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 531-532.
- Hughes, L (2003).** 'Climate change and Australia: trends, projections and impacts.' *Austral Ecology*, **28**: 423-443.
- Hume, ID, and Esson, C (1993).** 'Nutrients, antinutrients and leaf selection by captive koalas (*Phascolarctos cinereus*).' *Australian Journal of Zoology*, **41**: 379-392.
- Huxel, GR and Hastings, A (1999).** 'Habitat loss, fragmentation, and restoration.' *Restoration Ecology*, **7**: 309-315.
- Ingram, GJ. and McDonald, KR (1993).** 'An update on the decline of Queensland's frogs.' in D Lunney and D Ayers (eds.), *Herpetology in Australia: a diverse discipline*. Royal Zoological Society of New South Wales, Mosman, pp. 297-303.
- Ingram, GJ and Raven, RJ (eds.) (1991).** *An atlas of Queensland's frogs, reptiles, birds & mammals*. Queensland Museum, Brisbane.
- Isbell, RF (1962).** *Soils and vegetation of the brigalow lands, eastern Australia*. Division of Soils, CSIRO, Melbourne.
- Ives, AR, Klug, JL and Gross, K (2000).** 'Stability and species richness in complex communities.' *Ecology Letters*, **3**: 399-411.
- Jackson, J (2005).** 'Is there a relationship between herbaceous species richness and buffel grass (*Cenchrus ciliaris*).' *Austral Ecology*, **30**: 505-517.
- Jacquemyn, H, Butaye, J and Hermy, M (2001).** 'Forest plant species richness in small, fragmented mixed deciduous forest patches: the role of area, time and dispersal limitation.' *Journal of Biogeography*, **28**: 801-812.
- James, CD (2003).** 'Response of vertebrates to fenceline contrasts in grazing intensity in semi-arid woodlands of eastern Australia.' *Austral Ecology*, **28**: 137-151.

- Jansen, A and Robertson, AI (2001).** 'Relationships between livestock management and the ecological condition of riparian habitats along an Australian floodplain river.' *Journal of Applied Ecology*, **38**: 63-75.
- Jarman, PJ, Phillips, CM and Rabbidge, JJ (1991).** 'Diets of black-striped wallabies in New South Wales.' *Wildlife Research*, **18**: 403-412.
- Jenks GF and Caspall FC (1971).** 'Error on choroplethic maps: Definition, measurement, reduction.' *Annals of the Association of American Geographers*, **61**: 217-244.
- Jeschke, JM and Strayer, DL (2008).** 'Are threat status and invasion success two sides of the same coin?' *Ecography*, **31**: 124-130.
- Johnson, PM (2003).** *Kangaroos of Queensland*. Queensland Museum, South Brisbane.
- Johnson, PM (2008).** 'Black-striped Wallaby.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 329-330.
- Johnson, R (2001).** 'Fauna use of remnant brigalow communities in the Brigalow Belt South bioregion and implications for management.' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 77-83.
- Johnson, RW (1964).** *Ecology and control of brigalow in Queensland*. Queensland Department of Primary Industries, Brisbane.
- Johnson, RW (1981).** 'Choice of attributes to study succession in brigalow (*Acacia harpophylla*) communities.' In AN Gillison and DJ Anderson (eds.) *Vegetation classification in Australia*. CSIRO, Canberra. pp. 66-77.
- Johnson, RW (1984).** 'Flora and vegetation of the Brigalow Belt.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 41-59.
- Johnson, RW (2004).** 'Vegetation survey of the Brigalow Research Station, Theodore, Queensland.' *Proceedings of the Royal Society of Queensland*, **111**: 39-61.
- Johnson, RW and McDonald, WJF (2001).** 'Understanding biological and ecological processes as a means of managing remnant brigalow communities' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 14-21.
- Kanowski, J, Catterall, CP and Neilan, W (2008).** 'Potential value of weedy regrowth for rainforest restoration.' *Ecological Management & Restoration*, **9**: 88-99.
- Kanowski, J, Catterall, CP, Reis, T and Wardell-Johnson, G (2004).** 'Animal-plant interactions in rainforest restoration in tropical and subtropical Australia.' In *Animal-plant interactions in rainforest conservation and restoration*. J Kanowski, CP Catterall, AJ Dennis and DA Westcott. (eds.) Cooperative Research Centre for Tropical Rainforest Ecology and Management (Rainforest CRC), Cairns. pp. 20-24.
- Kanowski, JJ, Reis, TM, Catterall, CP and Piper, SD (2006).** 'Factors affecting the use of reforested sites by reptiles in cleared rainforest landscapes in tropical and subtropical Australia.' *Restoration Ecology*, **14**: 67-76.
- Keith, D (2004).** 'Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT.' NSW Department of Environment and Conservation, Sydney.
- Kend, BA (1997).** *Pythons of Australia*. Canyonlands Publishing Group, Provo, Utah.
- Kerle, JA and How, RA (2008).** 'Common Brushtail Possum.' In: S Van Dyck and R Strahan

- (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 274-276.
- Keto, A, Kennedy, S, Kwan, A and Scott, K (2004).** '(Draft) Conservation values and integrity of the Western Hardwoods Area: Brigalow Belt and New England Tableland Bioregions Southern Queensland.' Australian Rainforest Conservation Society. Unpublished Report.
- Kimber, SL, Bennett, AF and Ryan, PA (1999).** 'Revegetation and wildlife: What do we know about revegetation and wildlife conservation in Australia?' School of Ecology and Environment, Deakin University, Geelong.
- King, SA and Buckney, RT (2002).** 'Invasion of exotic plants in nutrient-enriched urban bushland.' *Austral Ecology*, **27**: 573-583
- Kingsford, RT (2000).** 'Ecological impacts of dams, water diversions and river management on floodplain wetlands in Australia.' *Austral Ecology*, **25**: 109-127.
- Kingsford, RT and Norman, FI (2002).** 'Australian waterbirds - products of the continent's ecology.' *Emu*, **102**: 47-69.
- Kingsford, RT, Watson, JEM, Lundquist, CJ, Venter, O, Hughes, L, Johnston, EL, Atherton, J, Gaweel, M, Keith, DA, Mackey, BG, Morley, C, Possingham, HP, Raynor, B, Recher, HF and Wilson, KA (2009).** 'Major conservation policy issues for biodiversity in Oceania.' *Conservation Biology*, **23**: 834-840.
- Kinnear, JE, Onus, ML and Sumner, NR (1998).** 'Fox control and rock-wallaby population dynamics: II. An update.' *Wildlife Research*, **25**: 81-88.
- Kutt, AS (1996).** 'Bird populations density in thinned, unthinned and old lowland regrowth forest, East Gippsland, Victoria.' *Emu*, **96**: 280-284.
- Kutt, AS, Hannah, DS and Thurgate, NY (2003).** 'Distribution, habitat and conservation status of *Paradelma orientalis* Gunther 1876 (Lacertilia: Pygopodidae).' *Australian Zoologist*, **32**: 61-264.
- Kutt, AS, Milne, DJ and Allison, FR (2008).** 'Hoary Wattled Bat.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 537-538.
- Lake, J and Leishman, MR (2004).** 'Invasion success of exotic plants in natural ecosystems: The role of disturbance, plant attributes and freedom from herbivores.' *Biological Conservation*, **117**: 215-226.
- Lambeck, RJ (1997).** 'Focal species: a multi-species umbrella for nature conservation.' *Conservation Biology*, **11**: 849-856.
- Land and Water Australia (2005).** 'Ecological thresholds for vegetation management in southern Queensland.' Report for Queensland Government. CSIRO, Brisbane.
- Landsberg, J, James, CD, Morton, SR, Hobbs, TJ, Stol, J, Drew, A and Tongway, H (1997).** 'The effects of artificial sources of water on rangeland biodiversity: final report to the Biodiversity Convention and Strategy Section of the Biodiversity Group, Environment Australia.' Environment Australia and CSIRO, Canberra.
- Lange, RT and Graham, CR (1983).** 'Rabbits and the failure of regeneration in Australian arid zone acacia.' *Australian Journal of Ecology*, **8**: 377-381.
- Laurance, WF, Williamson, GB, Delamônica, P, Oliveira, A, Lovejoy, TE, Gascon, C and Pohl, L (2001).** 'Effects of a strong drought on Amazonian forest fragments and edges.' *Journal of Tropical Ecology*, **17**: 771-785.
- Lavoral, S, and Garnier E, (2002).** 'Predicting changes in community composition and ecosystem functioning from plant traits: revisiting the holy grail.' *Functional Ecology*, **16**: 545-556.
- Law, BS, Anderson, J and Chidel, M (1999).** 'Bat communities in a fragmented forest

- landscape on the south-west slopes of New South Wales, Australia.' *Biological Conservation*, **88**: 333-345.
- Law, BS and Dickman, CR (1998)**. 'The use of habitat mosaics by terrestrial vertebrate fauna: implications for conservation and management.' *Biodiversity and Conservation*, **7**: 323-333.
- Lawler, IR, Foley, WJ and Eschler, BM (2000)**. 'Foliar concentration of a single toxin creates habitat patchiness for a marsupial folivore.' *Ecology*, **81**: 1327-1338.
- Lawler, IR, Foley, WJ, Eschler, BM, Pass, DM and Handasyde, K (1998)**. 'Intraspecific variation in *Eucalyptus* secondary metabolites determines food intake by folivorous marsupials.' *Oecologia*, **116**: 160-169.
- Lawton, JH and Brown, VK (1993)**. 'Redundancy in ecosystems.' In Schultze, ED and Mooney, HA (eds.) *Biodiversity and ecosystem function*. Springer-Verlag, Berlin. pp. 255-268.
- Leach, GJ (1988)**. 'Birds of Narayen Research Station, Mundubbera, south-east Queensland.' *Sunbird*, **18**: 55-75.
- Leach, GJ and Recher, HF (1993)**. 'Use of roadside remnants of softwood scrub vegetation by birds in south-eastern Queensland.' *Wildlife Research*, **20**: 233-249.
- Lemckert, F (1998)**. 'A survey for threatened herpetofauna of the south-west slopes of New South Wales.' *Australian Zoologist*, **30**: 492-500.
- Letnic, M and Koch, F (2009)**. 'Are dingoes a trophic regulator in arid Australia? A comparison of mammal communities on either side of the dingo fence.' *Austral Ecology*, doi:10.1111/j.1442-9993.2009.02022.x
- Lesta, NC (2008)**. *Woodlands to weeds; Southern Queensland Brigalow Belt*. Copyright Publishing, Brisbane.
- Leverington, A and Playford J (2001)**. 'Autecology and Conservation in the Brigalow Belt.' In *Remnant Vegetation in the Brigalow belt Management and Conservation*. Proceedings of the symposium presented by Central Queensland University's Centre of Environmental Management. University Publishing Unit, Central Queensland University, Rockhampton.
- Lindenmayer, DB, Cunningham, RB, Pope, ML and Donnelly, CF (1999)**. 'The response of arboreal marsupials to landscape context: a large-scale fragmentation study.' *Ecological Applications*, **9**: 594-611.
- Lindenmayer, DB and Fischer, J (2006)**. *Habitat Fragmentation and Landscape Change: an ecological and conservation synthesis*. CSIRO, Victoria.
- Lindenmayer, D, Hobbs, RJ, Montague-Drake, R, Alexandra, J, Bennet, A, Burgman, M, Cale, P, Calhoun, A, Cramer, V, Cullen, P, Driscoll, D, Fahrig, L, Fischer, J, Franklin, J, Haila, Y, Hunter, M, Gibbons, P, Lake, S, Luck, G, MacGregor, C, McIntyre, S, MacNally, R, Manning, A, Miller, J, Mooney, H, Noss, R, Possingham, H, Saunders, D, Schmiegelow, F, Scott, M, Simberloff, D, Sisk, T, Tabor, G, Walker, B, Wiens, J, Woinarski, J and Zavalenta, E (2007)**. 'A checklist for ecological management of landscapes for conservation.' *Ecology Letters*, **11**: 78-91.
- Lindenmayer, DB, and Luck, G (2005)**. 'Ecological thresholds: a synthesis.' *Biological Conservation*, **124**: 351-354.
- Lindenmayer, DB, Welsh, A, Donnelly, C, Crane, M, Michael, D, Macgregor, C, McBurney, L, Montague-Drake, R and Gibbons, P (2009)**. 'Are nest boxes a viable alternative source of cavities for hollow-dependent animals? Long-term monitoring of nest box occupancy, pest use and attrition.' *Biological Conservation*, **142**: 33-42.
- Lithgow, G (1997)**. *60 wattles of the Chinchilla and Murilla Shires*. The Author, Chinchilla.



- Lithgow, G (2008).** *Plant treasures. Orchids and other uncommon plants around Chinchilla and Miles.* Chinchilla Field Naturalist's Club, Chinchilla.
- Lloyd, PL (1984).** 'Agricultural and pastoral land use in the Brigalow Belt of Queensland.' In A Bailey (ed.) *The Brigalow Belt of Australia.* Royal Society of Queensland, Brisbane. pp. 81-96.
- Lloyd, PL (1984).** 'The climatic environment of the Brigalow Belt of Queensland.' In A Bailey (ed.) *The Brigalow Belt of Australia.* Royal Society of Queensland, Brisbane. pp. 23-40.
- Loch, LS (2000).** 'Effects of vegetation cover on runoff and erosion under simulated rain and overland flow on a rehabilitated site on the Meandu Mine, Tarong, Queensland.' *Australian Journal of Soil Research*, **38**: 299-312.
- Lockwood, D and Robinson, D (1997).** 'The grey-crowned babbler *Pomatostomus temporalis* on the Mornington Peninsula - going, going, gone?' *Victorian Naturalist*, **114**: 269-277.
- Lodge, DM (1993).** 'Biological invasions: lessons for ecology.' *Trends in Ecology & Evolution*, **8**: 133-137.
- Longcore, T and Rich, C (2004).** 'Ecological light pollution.' *Frontiers in Ecology and the Environment*, **2**: 191-198.
- Lonsdale, WM (1994).** 'Inviting trouble: introduced pasture species in northern Australia.' *Australian Journal of Ecology*, **19**: 345-354.
- Lonsdale, WM (1999).** 'Global patterns of plant invasions and the concept of invisibility.' *Ecology*, **80**: 1522-1536.
- Loreau, M, Mouquet, N and Gonzales, A (2003).** 'Biodiversity as spatial insurance in heterogeneous landscapes.' *Proceedings of the National Academy of Science*, **100**: 804-810.
- Low, T (1995).** 'The animals of Brisbane: A vertebrate status review.' Unpublished report prepared for Brisbane City Council.
- Low, T (2008).** 'Climate change & invasive species: a review of interactions.' Department of the Environment, Water, Heritage and the Arts, Canberra.
- Loyn, RH (1987).** 'Effects of patch area and habitat on bird abundances, species numbers and tree health in fragmented Victorian forests.' In: D Saunders, G Arnold, A Burbidge and A Hopkins (eds.), *Nature conservation: the role of remnants of native vegetation.* Surrey Beatty & Sons, Chipping Norton, pp 65-77.
- Luck, GW, Possingham, HP and Paton, DC (1999).** 'Bird responses at inherent and induced edges in the Murray Mallee, South Australia. 1. Differences in abundance and diversity.' *Emu*, **99**: 157-169.
- Luck, GW, Possingham, HP and Paton, DC (1999).** 'Bird responses at inherent and induced edges in the Murray Mallee, South Australia. 2. Nest predation as an edge effect.' *Emu*, **99**: 170-175.
- Lugo, AE and Helmer, E (2004).** 'Emerging forests on abandoned land: Puerto Rico's new forests.' *Forest Ecology and Management*, **190**: 145-161.
- Lunney, D, Curtin, AL, Fisher, D, Ayers, D and Dickman, CR (1997).** 'Ecological attributes of the threatened fauna of New South Wales.' *Pacific Conservation Biology*, **3**: 13-26.
- MacNally, R and Brown, GW (2001).** 'Reptiles and habitat fragmentation in the box-ironbark forests of central Victoria, Australia: predictions, compositional change and faunal nestedness.' *Oecologia*, **128**: 116-125.
- MacNally, R, Parkinson, A, Horrocks, G, Conole, L and Tzaros, C (2001).** 'Relationships between terrestrial vertebrate diversity, abundance and availability of coarse woody debris on south-eastern Australian floodplains.' *Biological Conservation*, **99**: 191-205.

- MacNally, R, Soderquist, TR and Tzaros, C (2000).** 'The conservation value of mesic gullies in dry forest landscapes: avian assemblages in the box-ironbark ecosystem of southern Australia.' *Biological Conservation*, **93**: 293-302.
- Majer, JD (1990).** 'Rehabilitation of disturbed land: long-term prospects for the recolonization of fauna.' *Proceedings of the Ecological Society of Australia*, **16**: 509-519.
- Mann, J. (1970).** 'Cacti naturalized in Australia and their control.' Department of Lands, Queensland.
- Manning, AD, Gibbons, P and Lindenmayer, DB (2009).** 'Scattered trees; a complementary strategy for facilitating adaptive responses to climate change in modified landscapes?' *Journal of Applied Ecology*, **46**: 915-919.
- Manning, AD, Fischer, J and Lindenmayer, DB (2006).** 'Scattered trees are keystone structures – implications for conservation.' *Biological Conservation*, **132**: 311-321.
- Manning, AD and Lindenmayer, DB (2009).** 'Paddock trees, parrots and agricultural production: An urgent need for large-scale, long-term restoration in south-eastern Australia.' *Ecological Management & Restoration*, **10**: 126-135.
- Marchant, S and Higgins, PJ (eds.) (1990).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 1, Ratites to ducks, Part B Australian Pelican to ducks*. Oxford University Press, Melbourne.
- Marchant, S and Higgins, PJ (eds.) (1993).** *Handbook of Australian, New Zealand & Antarctic Birds, Volume 2, Raptors to lapwings*. Oxford University Press, Melbourne.
- Margules, CR, Nicholls, AO and Pressey, RL (1988).** 'Selecting networks of reserves to maximize biological diversity.' *Biological Conservation*, **43**: 63-76.
- Maron, M (2009).** 'Nesting, foraging and aggression of noisy miners relative to road edges in an extensive Queensland forest.' *Emu*, **109**: 75-81.
- Maron, M and Lill, A (2005).** 'The influence of livestock grazing and weed invasion on habitat use by birds in grassy woodland remnants.' *Biological Conservation*, **124**: 439-450.
- Martin, RW, Handasyde, KA and Krockenberger, A (2008).** 'Koala.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 198-201.
- Martin, TG and McIntyre, S (2007).** 'Impacts of livestock grazing and tree clearing on birds of woodland and riparian habitats.' *Conservation Biology*, **21**: 504-514.
- Martin, TG, McIntyre, S, Catterall, CP and Possingham, HP (2006).** 'Is landscape context important for riparian conservation? Birds in grassy woodland.' *Biological Conservation*, **127**: 201-214.
- Martin, WK, Eyars-Chaddock, M, Brian, RW and Lemon, J (2004).** 'The value of habitat reconstruction to birds at Gunnedah, New South Wales.' *Emu*, **104**: 177-189.
- Mathieson, M and Smith, GC (2007).** 'National recovery plan for the black-breasted button-quail *Turnix melanogaster*.' Report to the Department of the Environment and Water Resources, Canberra. Queensland Parks and Wildlife Service, Brisbane.
- Matlack, GR (1994).** 'Plant species migration in mixed-history forest landscape in eastern North America.' *Ecology*, **75**: 1491-1502.
- Matson, PA, Parton, WJ, Power, AG and Swift, MJ (1997).** 'Agricultural intensification and ecosystem properties.' *Science*, **277**: 504-509.
- Maxwell, S, Burbidge, AA and Morris, K (1996).** *The action plan for Australian marsupials and monotremes*. Wildlife Australia, Canberra.



- May, SA and Norton, TW (1996).** 'Influence of fragmentation and disturbance on the potential impact of feral predators on native fauna in Australian forest ecosystems.' *Wildlife Research*, **23**: 387-400.
- McAlpine, CA, Fensham, RJ and Temple-Smith, DE (2002).** 'Biodiversity conservation and vegetation clearing in Queensland: principles and thresholds.' *The Rangeland Journal*, **24**: 36-55.
- McAlpine, CA, Bowen, ME, Callaghan, JG, Lunney, D, Rhodes, JR, Mitchell, DL, Pullar, DV and Possingham, HP (2006).** 'Testing alternative models for the conservation of koalas in fragmented rural-urban landscapes. *Austral Ecology*, **31**: 529-544.
- McAlpine, CA, Rhodes, JR, Callaghan, JG, Bowen, ME, Lunney, D, Mitchell, DL, Pullar, DV and Possingham, HP (2006).** 'The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: A case study of koalas in Queensland, Australia.' *Biological Conservation*, **132**: 153.
- McDonald, WJF and Niehus, RE (2001).** 'Distribution and status of the vine thicket communities of the Brigalow Belt Bioregion of Queensland.' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 31-34.
- McDonald, T and Williams, J (2009).** 'A perspective on the evolving science and practice of ecological restoration in Australia.' *Ecological Management & Restoration*, **10**: 113-125.
- McFadyan, RE (1984).** 'Alien weeds.' In: A Bailey (ed.) *The Brigalow Belt of Australia*. The proceedings of a Symposium held at the John Kindler Memorial Theatre, Queensland Institute of Technology, 23 October 1982. The Royal Society of Queensland.
- McFarland, D, Haseler, M, Venz, M, Reis, T, Ford, G and Hines, B (1999).** 'Terrestrial vertebrate fauna of the Brigalow Belt South Bioregion: Assessment and analysis for conservation planning.' Queensland Environmental Protection Agency, Brisbane.
- McFarland, D, Venz, M and Reis, T (1999).** 'Priority species summaries. An attachment to the report: Terrestrial vertebrate fauna of the Brigalow Belt South Bioregion: Assessment and analysis for conservation planning.' Queensland Environmental Protection Agency, Brisbane.
- McIntyre, S (1994).** 'Integrating agricultural land-use and management for conservation of a native grassland flora in a variegated landscape.' *Pacific Conservation Biology*, **1**: 236-244.
- McIntyre, S and Hobbs, RJ (1999)** A framework for conceptualizing human effects on landscapes and its relevance to management and research models. *Conservation Biology*, **13**. 1282 – 1292.
- McIntyre, S, McIvor, JG and MacLeod, ND (2000).** 'Principles for sustainable grazing in eucalypt woodlands: landscape-scale indicators and the search for thresholds. In: P Hale, A Petrie, D Moloney and P Sattler (eds.) *Management for Sustainable Ecosystems*. Centre for Conservation Biology, Brisbane. pp 92-100.
- McKay, GM (2008).** 'Greater Glider.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 240-242.
- McKay, GM and Ong, P (2008).** 'Common Ringtail Possum.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 255-257.
- McLaughlin, A and Mineau, P (1995).** 'The impact of agricultural practices on biodiversity.' *Agriculture, Ecosystems and Environment*, **55**: 201-212.

- Menkhorst, PW (ed.) (1995).** *Mammals of Victoria: Distribution, ecology and conservation*. Oxford University Press, Melbourne.
- Menkhorst, PW and Knight, F (2004).** *A field guide to the mammals of Australia*. Oxford University Press, Melbourne.
- Mesquita, RCG, Delamônica, P and Laurance, WF (1999).** 'Effect of surrounding vegetation on edge-related tree mortality in Amazonian forest fragments.' *Biological Conservation*, **91**: 129-134.
- Mesquita, RCG, Ickes, K, Ganade, G and Williamson, GB (2001).** 'Alternative successional pathways in the Amazon Basin.' *Journal of Ecology*, **89**: 528-537.
- Mitchell, J (1993).** 'Systematic assessment of feral pig damage and recommended pig control methods in the wet tropics World Heritage Area.' Final Report to the Wet Tropics Management Agency. Department of Lands, Charters Towers, Queensland.
- Moloney, D, Wormington, K and DeStefano, S (2002).** 'Stag retention and use by arboreal marsupials in eucalypt forests of southeast Queensland, Australia: implications for management.' USDA Forest Service Gen. Rep. PSW-GTR-181. pp. 347-355.
- Moore, BD and Foley, WJ (2000).** 'A review of feeding and diet selection in koalas (*Phascolarctos cinereus*).' *Australian Journal of Zoology*, **48**: 317-333.
- Moran, C, Catterall, CP, Green, RJ and Olsen, MF (2004).** 'Functional variation among frugivorous birds: implications for rainforest seed dispersal in a fragmented subtropical landscape.' *Oecologia*, **141**: 584-595.
- Murcia, C (1995).** 'Edge effects in fragmented forests: implications for conservation.' *Trends in Ecology & Evolution*, **10**: 58-62.
- Myers, B, Allan, G, Bradstock, R, Dias, L, Duff, G, Jacklyn, P, Landsberg, J, Morrison, J, Russell-Smith, J and Williams, R (2004).** *Fire Management in the Rangelands*. Tropical Savannas CRC, Darwin.
- Nagendra, H and Gadgil, M (1999).** 'Biodiversity assessment at multiple scales: linking remotely sensed data with field information.' *Proceedings of the National Academy of Science*, **96**: 9154-9158.
- Naiman, RJ, Décamps, H and Pollock, M (1993).** 'The role of riparian corridors in maintaining regional biodiversity.' *Ecological Applications*, **3**: 209-212.
- Neldner, VJ (1984).** South Central Queensland. Vegetation Survey of Queensland Department of Primary Industries Botany bulletin No. 3.
- Neldner, VJ, Wilson, BA, Thompson, EJ and Dillewaard, HA (2005).** 'Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 3.1.' Queensland Herbarium, Environmental Protection Agency, Brisbane.
- Nelson, JE (1965).** 'Movements of Australian flying foxes (Pteropodidae: Megachiroptera).' *Australian Journal of Zoology*, **13**: 53-73.
- Newsome, AE, Catling, PC and Corbett, LK (1983).** 'The diet of the dingo. II. Dietary and numerical relationships with fluctuating populations of prey in south-eastern Australia.' *Australian Journal of Ecology*, **8**: 345-366.
- Nielsen, L (1969).** 'Psittacines of southern Queensland.' *The South Australian Ornithologist*, **25**: 89-93.
- Nix, H (1994).** 'The brigalow.' In S Dovers (ed.) *Australian environmental history: essays and cases*. Oxford University Press, Melbourne. pp. 198-223.
- Noble, IR and Slatyer, RO (1980).** 'The use of vital attributes to predict successional changes in plant communities subject to recurrent disturbance.' *Vegetation*, **43**: 5-21.
- Norman, FI (1988).** 'Long-term effects of rabbit reduction on Rabbit Island Wilson's

- Promontory Victoria.' *Victorian Naturalist*, **105**: 136-141.
- Norton, DA, Hobbs, RJ and Atkins, L (1995).** 'Fragmentation, disturbance, and plant distribution: mistletoes in woodland remnants in the Western Australian Wheatbelt.' *Conservation Biology*, **9**: 426-438.
- NPWS (2002).** 'Approved Recovery Plan for the Red Goshawk (*Erythrorhynchus radiatus*).'  
NSW National Parks and Wildlife Service, Hurstville.
- NPWS (2002).** *Threatened species of the upper north coast of New South Wales: fauna*.  
NSW Parks and Wildlife Service, Coffs Harbour.
- NPWS (2003).** *Threatened Species of the New England Tablelands and north west slopes of New South Wales*. NSW Parks and Wildlife Service, Coffs Harbour.
- NRM (1996).** 'Prickly acacia (*Acacia nilotica*) Pest status review series – land protection branch.' AP Mackey (ed.), Department of Natural Resources and Mines, Queensland.
- NSW Scientific Committee (2005).** 'Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions - endangered ecological community listing - final determination.'  
<http://www.environment.nsw.gov.au/determinations/MyallWoodlandWesternEndSpListing.htm>
- Oliver, DL (2000).** 'Foraging behaviour and resource selection of the regent honeyeater *Xanthomyza phrygia* in northern New South Wales.' *Emu*, **100**: 12-30.
- Oliver, DL, Chambers, MA and Parker, DG (2003).** 'Habitat and resource selection of the painted honeyeater (*Grantiella picta*) on the northern floodplains region of New South Wales.' *Emu*, **103**: 171-176.
- Olsen, P (1998).** 'Australia's raptors: diurnal birds of prey and owls.' *Wingspan*, **8**: supplement I-XVI.
- Olsson, M, Wapstra, E, Swan, G, Snaith, E, Clarke, R and Madsen, T (2005).** 'Effects of long-term fox baiting on species composition and abundance in an Australian lizard community.' *Austral Ecology*, **30**: 907-913.
- Pahl, LI, and Hume, ID (1990).** 'Preferences for *Eucalyptus* species of the New England Tablelands and initial development of an artificial diet for koalas.' In: AK Lee, KA Handasyde and GD Sanson (eds.), *Biology of the Koala*. Surrey Beatty and Sons: Sydney. pp. 123-128.
- Panetta, ED, (1993).** 'A system for assessing proposed plant introductions for weed potential.' *Plant Protection Quarterly*, **8**: 10-14.
- Paekes, D, Newell, G and Cheal, D (2003).** 'Assessing the quality of native vegetation: the 'habitat hectares' approach.' *Ecological Management and Restoration*, **4**: S29-S38.
- Parkes, J, Henzell, R and Pickles G (1996).** 'Managing vertebrate pests: Feral goats.' Australian Government Publishing Service, Canberra.
- Parnaby, HE (2009).** 'A taxonomic review of Australian greater long-eared bats previously known as *Nyctophilus timoriensis* (Chiroptera: Vespertilionidae) and some associated taxa.' *Australian Zoologist*, **35**: 39-81.
- Parsons, W and Cuthbertson, EG (1992).** *Noxious weeds of Australia*. Inkata Press, Melbourne.
- Pass, DM, Foley, WJ and Bowden, B (1998).** 'Vertebrate herbivory on *Eucalyptus* – identification of specific feeding deterrents for common ringtail possums (*Pseudocheirus peregrinus*) by bioassay-guided fractionation of *Eucalyptus ovata* foliage.' *Journal of Chemical Ecology*, **24**: 1513-1527.
- Pearson, D, Greenlees, M, Ward-Fear, G and Shine, R (2009).** 'Predicting the ecological

- impact of cane toads (*Bufo marinus*) on threatened camaenid land snails in north-western Australia.' *Wildlife Research*, **36**: 533-540.
- Pearson, SM (1993)**. 'The spatial extent and relative influence of landscape-level factors on wintering bird populations.' *Landscape Ecology*, **8**: 3-18.
- Pedley, L (1978)**. 'A revision of *Acacia* Mill in Queensland.' *Austrobaileya*, **1**: 75-234.
- Pedley, L (1987)**. *Acacias in Queensland*. Brisbane, Department of Primary Industries.
- Pell, AS and Tidemann, CR (1997)**. 'The ecology of the common myna in urban nature reserves in the Australian Capital Territory.' *Emu*, **97**: 141-149.
- Pell, AS and Tidemann, CR (1997)**. 'The impact of two exotic hollow-nesting birds on two native parrots in savannah and woodland in eastern Australia.' *Biological Conservation*, **79**: 145-153.
- Pereira, IM, Andrade, LA, Sampaio, E and Barbosa, MRV (2003)**. 'Use history effects on structure and flora of caatinga.' *Biotropica*, **35**: 145-165.
- Phillips, BL, Brown, GP, Greenless, M, Webb, JK and Shine, R (2007)**. 'Rapid expansion of the cane toad (*Bufo marinus*) invasion front in tropical Australia.' *Austral Ecology*, **32**: 169-176.
- Phillips, BL, Brown, GP and Shine, R (2003)**. 'Assessing the potential impact of cane toads on Australian snakes.' *Conservation Biology*, **17**: 1738-1747.
- Phillips, BL, Brown, GP and Shine, R (2004)**. 'Assessing the potential for an evolutionary response to rapid environmental change: invasive toads and an Australian snake.' *Evolutionary Ecology Research*, **6**: 799-811.
- Phillips, BL and Shine, R (2005)**. 'The morphology, and hence impact, of an invasive species (the cane toad, *Bufo marinus*): changes with time since colonisation.' *Animal Conservation*, **8**: 407-413.
- Phillips, BL and Shine, R (2006)**. 'Allometry and selection in a novel predator-prey system: Australian snakes and the invading cane toad.' *Oikos*, **112**: 122-130.
- Phillips, BL and Shine, R (2006)**. 'An invasive species induces rapid adaptive change in a native predator: cane toads and black snakes in Australia.' *Proceedings of the Royal Society of London Series B-Biological Sciences*, **273**: 1545-1550.
- Phillips, BL and Shine, R (2006)**. 'Spatial and temporal variation in the morphology (and thus, predicted impact) of an invasive species in Australia.' *Ecography*, **29**: 205-212.
- Pimm, SL and Raven, P (2000)**. 'Biodiversity: extinction by numbers.' *Nature*, **403**: 843-845.
- Piper, SD and Catterall, CP (2004)**. 'Effects of edge type and nest height on predation of artificial nests within subtropical Australian eucalypt forests.' *Forest Ecology and Management*, **203**: 361-372.
- Pizzey, G and Knight, F (2003)**. *The field guide to the birds of Australia*. HarperCollins, Sydney.
- Possingham, HP, Andelman, SJ, Noon, BR, Trombulak, S and Pulliam, HR (2001)**. 'Making smart conservation decisions. In: ME Soule and G Orians (eds.), *Conservation Biology: Research Priorities for the Next Decade*. Island Press, Covelo, California. pp. 225-244.
- Priddel, D, Carlile, N, Davey, C, and Fullagar, P (1995)**. 'The status of Gould's petrel, *Pterodroma leucoptera leucoptera*, on Cabbage Tree Island, New South Wales.' *Wildlife Research*, **22**: 601-610.
- Pringle, JD (1985)**. *The waterbirds of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, North Ryde.



- Pringle, JD (1987).** *The shorebirds of Australia: the National Photographic Index of Australian Wildlife*. Angus and Robertson, North Ryde.
- Procheş, S, Wilson, JRU, Richardson, DM and Rejmánek, M (2008).** 'Searching for phylogenetic pattern in biological invasions.' *Global Ecology and Biogeography*, **17**: 5-10.
- Queensland CRA/RFA Steering Committee (1998).** 'Survey of threatened plant species in South East Queensland Biogeographical Region.' [Online]. Available from: <http://www.daff.gov.au/rfa/regions/qld/environment/threatened-plant>.
- Queensland Museum (2009).** 'Fauna Database.' Queensland Museum, Brisbane. Accessed 15 July 2009.
- Ranjan, R (2008).** 'Environmental restoration of invaded ecosystems: How much versus how often?' *Journal of Environmental Management*, **86**: 616-626.
- Read, DG (2008).** 'Narrow-nosed Planigale.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 114-116.
- Recher, HF (1999).** 'The state of Australia's avifauna: a personal opinion and prediction for the new millennium.' *Australian Zoologist*, **31**: 11-27.
- Recher, HF (2007).** 'Conservation challenge of dispersive fauna.' *Pacific Conservation Biology*, **13**: 81-83.
- Reid, JRW (2000).** 'Threatened and declining birds in the New South Wales Sheep-Wheat Belt: II. landscape relationships - modelling bird atlas data against vegetation cover.' CSIRO Sustainable Ecosystems, Canberra
- Reeves, A (1992).** 'Goats as a threat to conservation.' In: D. Freudenberger (ed.), *Proceedings of the National Workshop on Feral Goat Management*. Bureau of Resource Sciences, Canberra. pp. 21-22.
- Richards, SJ, McDonald, KR and Alford, RA (1993).** 'Declines in populations of Australia's endemic tropic frogs.' *Pacific Conservation Biology*, **1**: 66-77.
- Richardson, R (2006).** 'Queensland Brigalow Belt Reptile Recovery Plan.' Report to the Department of the Environment, Water, Heritage and the Arts, Canberra. WWF-Australia, Brisbane.
- Ries, L and Sisk, TD (2004).** 'A predictive model of edge effects.' *Ecology*, **85**: 2917-2926.
- Roberts, A, Klomp, N and Birkhead, J (1996).** 'Monitoring marine and terrestrial hunting in an Aboriginal community in north Queensland.' In: M Bomford and J Caughley (eds.), *Sustainable use of wildlife by Aboriginal peoples and Torres Strait Islanders*. Bureau of Resource Sciences, Australian Government Printing Service, Canberra. pp 152-164.
- Roberts, BJ, Catterall, CP, Kanowski, J and Eby, P (2008).** A re-evaluation of the northern distributional limit of the grey-headed flying-fox, *Pteropus poliocephalus*. *Australian Bat Society News*.
- Robertson, P and Cooper, P (2000).** 'Recovery plan for the grassland earless dragon (*Tympanocryptis pinguicolla*).' Unpublished report to Environment Australia, Canberra.
- Robinson, D and Traill, BJ (1996).** 'Conserving woodland birds in the wheat and sheep belts of southern Australia.' RAOU Conservation Statement No. 10, RAOU, Hawthorn East.
- Robley, A, Reddiex, B, Arthur, T, Pech, R and Forsyth, D (2004).** 'Interactions between feral cats, foxes, native carnivores, and rabbits in Australia.' Final report for the Australian Government Department of Environment and Heritage.
- Rowe, M (2002).** 'Chapter 1: current status of native vegetation in the Riverina.' In: K Kent, G Earl, B Mullins, I Lunt and R Webster (eds.), *Native Vegetation Guide for the Riverina*. Charles Sturt University, Berrigan Shire and Native Dog Landcare Group.

- Ross, KA, Fox, BJ and Fox, MD (2002).** 'Changes to plant species richness in forest fragments: fragment age, disturbance and fire history may be as important as area.' *Journal of Biogeography*, **29**: 749–751.
- Russell, JS (1973).** 'Effects of land smoothing on gilgaied soils on certain soil properties and plant growth.' *Tropical Grasslands*, **7**: 209–218.
- Sattler, P (1999).** 'Introduction.' In: P Sattler and R Williams (eds.), *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane. pp. 1/1-1/19.
- Sattler, PS and Webster, RJ (1984).** 'The conservation status of Brigalow (*Acacia harpophylla*) communities in Queensland.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 149-160.
- Sattler, PS and Williams, RD (eds.) (1999).** *The conservation status of Queensland's bioregional ecosystems*. Queensland Environmental Protection Agency, Southern Region, Brisbane.
- Saunders, D, Brereton, R, Tzaros, C, Holdsworth, M and Price, R (2007).** 'Conservation of the swift parrot *Lathamus discolor* – management lessons for a threatened migratory species.' *Pacific Conservation Biology*, **13**: 111-119.
- Saunders, DA and Hobbs, RJ (1991).** 'The role of corridors in conservation: what do we know and where do we go?' In: DA Saunders and RJ Hobbs (eds.), *Nature conservation 2: The role of corridors*. Surrey Beatty & Sons, Chipping Norton. pp. 421-27.
- Saunders, DA, Hobbs, RJ and Margules, CR (1991).** 'Biological consequences of ecosystem fragmentation: a review.' *Conservation Biology*, **5**: 18-32.
- Saunders, DA, Margules, C and Hill, B (1998).** *Environmental indicators for national state of the environment reporting – biodiversity, Australia: state of the environment (environmental indicator reports)*. Department of the Environment, Canberra.
- Saunders, DL and Heinsohn, R (2008).** 'Winter habitat use by the endangered, migratory swift parrot (*Lathamus discolor*) in New South Wales.' *Emu*, **108**: 81-89.
- Saunders, G, Berghout, M, Kay, B, Triggs, B, van de Van, R and Winstanely, R (2004).** 'The diet of foxes (*Vulpes vulpes*) in south-eastern Australian and the potential effects of rabbit haemorrhagic disease.' *Wildlife Research*, **31**: 13-18.
- Saunders, G, Coman, BJK and Braysher, M (1995).** 'Managing vertebrate pests: Foxes.' Bureau of Resource Sciences, Canberra.
- SBRVMC (2003).** 'Southern Brigalow Region draft regional vegetation management plan.' Southern Brigalow Regional Vegetation Management Committee, location unknown.
- Scale, DB (1980).** 'Influence of amphibian larvae on primary production, nutrient flux and amphibians.' *Ecology*, **61**:1531-1550.
- Schaumburg, JB (1984).** 'Forestry in the Brigalow Belt.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 97-101.
- Schulz, M (1998).** 'Bats and other fauna in disused fairy martin *Hirundo arial* nests.' *Emu*, **98**:184-191.
- Schulz, M and Eyre, TJ (1997).** 'New distribution and habitat data for the pygopodid, *Paradelma orientalis* (Gunther 1876).' *Memoirs of the Queensland Museum*, **42**: 12.
- Scott, G (ed.) (1988).** *Lake Broadwater: The natural history of an inland lake and its environs*. Darling Downs Institute Press, Toowoomba.
- Scougall, SA, Majer, JD and Hobbs, RJ (1993).** 'Edge effects in grazed and ungrazed Western Australian wheatbelt remnants in relation to ecosystem reconstruction.' In: DA Saunders, RJ Hobbs and PR Ehrlich (eds.),



- Nature conservation 3: Reconstruction of fragmented ecosystems, global and regional perspectives.* Surrey Beatty & Sons, Chipping Norton. pp. 163-178.
- Seabloom, EW, Dobson, AP and Stoms, DM (2002).** 'Extinction rates under nonrandom patterns of habitat loss.' *Proceedings of the National Academy of Sciences*, **99**: 11229-11234.
- Seabrook, WA and Dettmann, EB (1996).** Roads as activity corridors for cane toads in Australia. *Journal of Wildlife Management*, **60**: 363-368.
- Seabrook, L, McAlpine, C and Fensham, R (2008).** 'Spatial and temporal analysis of vegetation change in agricultural landscapes: A case study of two Brigalow (*Acacia harpophylla*) landscapes in Queensland, Australia.' *Agriculture, Ecosystems and Environment*, **120**: 211-228.
- Seabrook, L, McAlpine, C and Fensham, R (2008).** 'What influences farmers to keep trees? A case study from the Brigalow Belt, Queensland, Australia.' *Landscape and Urban Planning*, **84**: 266-281.
- Seabrook, WA and Dettmann, EB (1996).** Roads as activity corridors for cane toads in Australia.' *Journal of Wildlife Management*, **60**: 363-368.
- Sedgwick, EH (1948).** 'Notes on bird-life at Kowguran, Queensland.' *Emu*, **48**: 59-63.
- Seidman, VM and Zabel, CJ (2001).** 'Bat activity along intermittent streams in northwestern California.' *Journal of Mammalogy*, **82**: 738-747.
- Seton, D and Wood, V (1988).** 'Birds.' In: G Scott (ed.), *Lake Broadwater: The natural history of an inland lake and its environs*. Darling Downs Institute Press, Toowoomba. pp. 274-303.
- Setterfield, SA, Douglas, MM, Hutley, LB and Welch, MA (2005).** 'Effects of canopy and ground disturbance on establishment of an invasive grass in an Australian savanna.' *Biotropica*, **37**: 25-31.
- Sharpe, DJ and Goldingay, RL (1998).** 'Feeding behaviour of the squirrel glider at Bungawalbin Nature Reserve, north-eastern New South Wales.' *Wildlife Research*, **25**: 243-254.
- Shea, GM (1987).** 'Notes on the biology of *Paradelma orientalis*.' *Herpetofauna*, **17**: 6.
- Shelly, D (1998).** 'Survey of vertebrate fauna and habitats in a cypress pine-ironbark forest in central-west New South Wales.' *Australian Zoologist*, **30**: 426-436.
- Shine, R (1981).** 'Ecology of Australian elapid snakes of the genera *Furina* and *Glyphodon*.' *Journal of Herpetology*, **15**: 219-224.
- Short, J (1998).** 'The extinction of rat-kangaroos (Marsupialia: Potoroidae) in New South Wales, Australia.' *Biological Conservation*, **86**: 365-377.
- Short, J, Kinnear, JE and Robley, A (2002).** 'Surplus killing by introduced predators in Australia: Evidence for ineffective anti-predator adaptations in native prey species?' *Biological Conservation*, **103**: 283-301.
- Short, J, Turner, B and Risbey, D (2002).** Control of feral cats for nature conservation. III Trapping. *Wildlife Research*, **29**: 475-487.
- Simberloff, DS and Cox, J (1987).** 'Consequences and costs of conservation corridors.' *Conservation Biology*, **1**: 63-71.
- Simberloff, D and Gibbons, L (2004).** 'Now you see them, now you don't! - population crashes of established introduced species.' *Biological Invasions*, **6**: 161-172.
- Smith, AP and Murray, M (2003).** 'Habitat requirements of the squirrel glider (*Petaurus norfolcensis*) and associated possums and gliders on the New South Wales central coast.' *Wildlife Research*, **30**: 291-301.
- Smith, GT, Arnold, GW, Sarre, S, AbenspergTraun, M and Steven, DE**

- (1996). 'The effects of habitat fragmentation and livestock grazing on animal communities in remnants of gimlet *Eucalyptus salubris* woodland in the Western Australian wheatbelt. II. Lizards.' *Journal of Applied Ecology*, **33**: 1302-1310.
- Smyth, AK (1997).** 'Mammals, birds, reptiles and frogs of the Brigalow Belt Bioregion of Queensland.' Centre for Conservation Biology: Brisbane.
- Smyth, AK. and Young, J (1996).** 'Observations on the endangered black-breasted button-quail *Turnix melanogaster* breeding in the wild.' *Emu*, **96**: 202-207.
- Soderquist, T and Rhind, S (2008).** 'Brush-tailed Phascogale.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 105-107.
- Sorley, J and Bennie, M (1988).** 'Frogs.' In: G Scott (ed.), *Lake Broadwater: The natural history of an inland lake and its environs*. Darling Downs Institute Press, Toowoomba. pp. 260-264.
- Soulé, ME and Gilpin, ME (1991).** 'The theory of wildlife corridor capability.' In: DA Saunders and RJ Hobbs (eds.), *Nature conservation 2: The role of corridors*. Surrey Beatty & Sons, Chipping Norton. pp. 3-8.
- Stanisic, J (1998).** 'A survey of the land snails of the Queensland Brigalow Lands: Their distribution, conservation status and close association with dry vine thickets.' Queensland Museum, report prepared for Queensland Department of Environment.
- Stanisic, J, Shea, M, Potter, D and Griffiths, O (in preparation).** *Australian land snails: Volume 1. A field guide to eastern Australian species*. Publisher unknown, Singapore.
- Stanley, TD and Ross, EM (1983).** *Flora of south-eastern Queensland: Volume 1*. Queensland Department of Primary Industries, Brisbane.
- Stanley, TD and Ross, EM (1986).** *Flora of south-eastern Queensland: Volume 2*. Queensland Department of Primary Industries, Brisbane.
- Stanley, TD and Ross, EM (1989).** *Flora of south-eastern Queensland: Volume 3*. Queensland Department of Primary Industries, Brisbane.
- Statham, M and Middleton, M (1987).** 'Feral pigs on Flinders Island.' *Papers and Proceedings of the Royal Society of Tasmania*, **121**: 121-124.
- Stephenson, G and Schmida, G (2008).** 'A second record of the elapid snake *Furina dunmalli* from New South Wales.' *Herpetofauna*, **38**: 22-23.
- Sutherst, B, Szabo, J and Cleland, E (2007).** 'The stock routes and road network – strengthening the biodiversity links.' *Wingspan*, **14**: supplement 23.
- Swan, G and Wilson, S (2008).** *What snake is that? Introducing Australian snakes*. Reed New Holland, Sydney.
- Swift, MJ, Izac, A-MN and van Noordwijk, M (2004).** 'Biodiversity and ecosystem services in agricultural landscapes – are we asking the right questions?' *Agriculture, Ecosystems and Environment*, **104**: 113-134.
- Taylor, IR (2003).** 'Australia's temporary wetlands: what determines their suitability as feeding and breeding sites for waders?' *Wader Study Group Bulletin*, **100**: 54-58.
- Taylor, R, Duckworth, P, Johns, T and Warren, B (1997).** 'Succession in bird assemblages over a seven-year period in regrowth dry sclerophyll forest in south-east Tasmania.' *Emu*, **97**: 220-230.
- Theoharides, KA and Dukes JS, (2007).** 'Tansley review: Plant invasion across space and time: factors affecting nonindigenous species success during four stages of invasion.' *New Phytologist*, **176**: 256-273.
- Thompson, KT (1992).** 'Prickly acacia infestation of the Mitchell grasslands. Final Report:

National Soil Conservation Programme.  
 Richmond Landcare Group.

**Threatened Species Scientific Committee (2009).** 'Weeping myall woodlands listing advice: Advice to the Minister for the Environment, Water, Heritage and the Arts from the Threatened Species Scientific Committee (TSSC) on Amendments to the List of Ecological Communities under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).' <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/98-listing-advice.pdf>. (accessed November 2009).

**Tidemann, CR and Law, BS (2008).** 'Southern Forest Bat.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 569-570.

**Tilman, D (1996).** 'Biodiversity: population versus ecosystem stability.' *Ecology*, **77**: 350-363.

**Tilman, D (1997).** 'Biodiversity and ecosystem functioning.' In GC Daily (ed.) *Nature's services: societal dependence on natural ecosystems*. Island Press, Washington DC.

**Tilman, D and Downing, JA (1994).** 'Biodiversity and stability in grasslands.' *Nature*, **367**: 363-365.

**Tremul, PR (2000).** 'Breeding, feeding and arboreality in *Paradelma orientalis*: A poorly known, vulnerable pygopodid from Queensland, Australia. *Memoirs of the Queensland Museum*, **45**: 599-609.

**Trombulak, SC and Frissell, CA (2000).** Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology*, **14**: 18-30.

**Tscharntke, T, Steffan-Dewenter, I, Kruess, A and Thies, C (2002).** 'Contribution of small habitat fragments to conservation of insect communities of grassland-cropland landscapes.' *Ecological Applications*, **12**: 857-874.

**Tscharntke, T, Klein, AM, Kruess, A, Steffan-Dewenter, I and Thies, C (2005).** 'Landscape perspectives on agricultural intensification and biodiversity – ecosystem service management.' *Ecology Letters*, **8**: 857-874.

**Tunstall, BR and Connor, DJ (1981).** 'A hydrological study of a subtropical forest of *Acacia harpophylla* F. Muell. Ex Benth. (brigalow).' *Australian Journal of Botany*, **29**: 311-320.

**Turbill, C, Lumsden, LF and Ford, GI (2008).** 'South-eastern & Tasmanian Long-eared Bats.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 527-528.

**Turner, IM, Wong YK, Chew, PT, and bin Ibrahim, A (1997).** 'Tree species richness in primary and old secondary tropical forest in Singapore.' *Biodiver. Conserv.* **6**: 537–543.

**Uhl, C, Buschbacher, R and Serrao, EAS (1988).** 'Abandoned pastures in eastern Amazonia. 1. Patterns of plant succession.' *Journal of Ecology*, **76**: 663-681.

**Unidel Energy and Infrastructure, (2009).** 'Queensland Curtis LNG Project (upstream component) draft flora and fauna assessment.' Report prepared for Queensland Curtis LNG.

**Urban, MC, Phillips, BL, Skelly, DK and Shine, R (2007).** 'The cane toad's (*Chaunus* [*Bufo*] *marinus*) increasing ability to invade Australia is revealed by a dynamically updated range model.' *Proceedings of the Royal Society B*, **274**: 1413-1419.

**URS, (2009).** 'Final report Santos GLNG CSG field report – nature conservation.' Report prepared for Santos Ltd.

**Van der Ree, R and Suckling GC (2008).** 'Squirrel Glider.' In: S Van Dyck and R Strahan (eds.) *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 235-236.

- Van Dyck, S. and Strahan, R. (eds.) (2008).** *The mammals of Australia*. Third Edition. Reed New Holland, Sydney.
- Venz, M, Mathieson, M and Schulz, M (2002).** 'Fauna of the Dawson River Floodplain.' Queensland Parks and Wildlife Service, Brisbane.
- Vesk, PA and MacNally, R (2005).** 'The clock is ticking-Revegetation and habitat for birds and arboreal mammals in rural landscapes of southern Australia.' *Agriculture, Ecosystems and Environment*, **112**: 356-366.
- Vitousek, PM and Hooper, DU (1994).** 'Biological diversity and terrestrial ecosystem biogeochemistry.' In E-D Schulze and HA Mooney (eds.) *Biodiversity and ecosystem function*. Springer-Verlag, Berlin.
- Walter, AM, Christensen, S and Simmelsgaard. (2002).** 'Spatial correlation between weed species densities and soil properties.' *Weed Research*, **42**: 26–38.
- Wardle, DA, Barker, GM, Bonner, KI, and Nicholson KS, (1998).** 'Can comparative approaches based on plant ecophysiological traits predict the nature of biotic interactions and individual plant species effects in ecosystems?' *Journal of Ecology*, **86**: 405–420.
- Webb, AA (1984).** 'Consequences of agricultural land use in the Brigalow Belt.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 131-147.
- Webb, LJ (1984).** 'Nature conservation.' In A Bailey (ed.) *The Brigalow Belt of Australia*. Royal Society of Queensland, Brisbane. pp. 125-129.
- Weibull, AC, Ostman, O and Granqvist, A (2003).** 'Species richness in agroecosystems: the effect of landscape, habitat and farm management.' *Biodiversity and Conservation*, **12**: 1335-1355.
- West, BG, Cook, JD and House, APN (1999).** 'Ecological survey of brigalow (*Acacia harpophylla*) remnants in the Condamine floodplain area'. Queensland Forestry Research Institute, Gympie.
- Whitaker, PB and Shine, R (2000).** 'Sources of mortality of large elapid snakes in an agricultural landscape.' *Journal of Herpetology*, **34**: 121-128.
- White, M, Muir, AM and Webster, R (2002).** 'The reconstructed distribution of indigenous vegetation types across the NSW Riverina.' A draft report to the NSW National Parks and Wildlife Service. Ecology Australia Pty. Ltd., Fairfield.
- Whitmore, MJ, Dow, DD, Fisk, P and Moffatt, JD (1983).** 'An annotated list of the birds of Meandarra, Queensland.' *Emu*, **83**: 19-27.
- Wijdeven, SMJ and Kuzee, ME (2000).** 'Seed availability as a limiting factor in forest recovery processes in Costa Rica.' *Restoration Ecology*, **8**: 414-424.
- Wilcove, DS, McLellan, CH and Dobson, AP (1986).** 'Habitat fragmentation in the temperate zone.' In: ME Soulé (ed.), *Conservation biology*. Sinauer, Sunderland, MA. pp. 237–56.
- Williams, CK and Myers, K (2008).** 'Rabbit.' In: S Van Dyck and R Strahan (eds.), *The mammals of Australia*. Third Edition. Reed New Holland, Sydney. pp. 745-747.
- Williams, MR, Abbott, I, Liddelow, GL, Vellios, C, Wheeler, IB and Mellican, AE (2001).** 'Recovery of bird populations after clearfelling of tall open eucalypt forest in Western Australia.' *Journal of Applied Ecology*, **38**: 910-920.
- Williamson, I (1999).** 'Competition between the larvae of the introduced cane toad *Bufo marinus* (Anura: Bufonidae) and native anurans from the Darling Downs area of southern Queensland.' *Australian Journal of Ecology*, **24**: 636-643.



- Wilson, BA and Neldner, VJ (2001).** 'How much vegetation is left in the Brigalow Belt in Queensland? Is there enough?' In: A Exelby and A Melzer (eds.) *Remnant vegetation in the Brigalow Belt: Management and conservation*. Centre for Environmental Management, Central Queensland University, Gladstone. pp. 3-11.
- Wilson, BA, Neldner, VJ and Accad, A (2002).** 'The extent and status of remnant vegetation in Queensland and its implications for statewide vegetation management and legislation.' *The Rangeland Journal*, **24**: 6-35.
- Wilson, S (2003).** *Reptiles of the Southern Brigalow Belt*. WWF Australia, Brisbane.
- Wilson, S (2005).** *A field guide to reptiles of Queensland*. Reed New Holland, Sydney.
- Wilson, S and Swan, G (2008).** *A complete guide to reptiles of Australia*. Second Edition. New Holland, Sydney.
- Woinarski, JCZ and Ash, AJ (2002).** 'Responses of vertebrates to pastoralism, military land use and landscape position in an Australian tropical savanna.' *Austral Ecology*, **27**: 311-323.
- Woinarski, JCZ, Brock, C, Armstrong, M, Hempel, C, Cheal, D and Brennan, K (2000).** 'Bird distribution in riparian vegetation in the extensive natural landscape of Australia's tropical savanna: a broad-scale survey and analysis of a distributional data base.' *Journal of Biogeography*, **27**: 843-868.
- Woinarski, JCZ and Catterall, CP (2003).** 'Historical changes in the bird fauna at Coomoooolaroo, northeastern Australia, from the early years of pastoral settlement (1873) to 1999.' *Biological Conservation*, **116**: 379-401.
- Woinarski, JCZ, McCosker, JC, Gordon, G, Lawrie, B, James, C, Augusteyn, J, Slated, L and Danvers, T (2006).** 'Monitoring change in the vertebrate fauna of central Queensland, Australia, over a period of broad-scale vegetation clearance, 1973–2002.' *Wildlife Ecology*, **33**: 263–274.
- Woinarski, JCZ, Milne, DJ and Wanganeen, G (2001).** 'Changes in mammal populations in relatively intact landscapes of Kakadu National Park, Northern Territory.' *Austral Ecology*, **26**: 360-370.
- Wood, V and Allison, R (1988).** 'Mammals.' In: G Scott (ed.), *Lake Broadwater: The natural history of an inland lake and its environs*. Darling Downs Institute Press, Toowoomba. pp. 304-316.
- Woolley, A and Kirkpatrick, JB (1999).** Factors related to condition and rare and threatened species occurrence in lowland, humid basalt remnants in northern Tasmania. *Biological Conservation*, **87**: 131–142.
- Yates, RJ, Hobbs, RJ and Atkins, L (2000).** 'Establishment of perennial shrub and tree species in degraded *Eucalyptus salmonophloia* remnant woodlands: effects of restoration treatments.' *Restoration Ecology*, **8**: 135-143.
- Young, PAR, Wilson, BA, McCosker, JC, Fensham, RJ, Morgan, G and Taylor, PM (1999).** 'Brigalow Belt.' In: P Sattler and R Williams (eds.), *The conservation status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane. pp. 11/1-11/81.